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|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Hydraulics (1)</b>                     |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 142</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Pipelines and pipe systems; hydraulic models and similitude; flow in open channels; hydraulic structures and flow measurements. Hydraulic pumps and turbines.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                         |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>A1, A2, A3, A10, B1, B2</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                         |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                             |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic Science and mathematics.                                                                                                                                                                                                                                                                            | <b>LO1</b>                                                         | Identify. Cuml cross section properties and design.                                                                                     |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO2</b>                                                         | Develop the problem-solving techniques and analysis of the students and using creative thinking.                                        |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | Analysis of the problem-solving techniques and analysis of the students and using Creative thinking.                                    |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO4</b>                                                         | Apply engineering design processes to develop the problem-solving techniques and analysis for the students and using creative thinking. |
| <b>A10</b>                                                                       | Acquire and apply new knowledge, and practice self, lifelong and learning strategies.                                                                                                                                                                                                                                                                                                                       | <b>LO5</b>                                                         | Calculate Velocity and shear distribution.                                                                                              |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO6</b>                                                         | Study the hydraulic jump and flow to toe it as an energy dissipator downstream, the hydraulic structures.                               |

|           |                                                                                                                                                                                                                                                                                                                                                                |            |                                                                                                                                                                                            |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO7</b> | Achieve an optimum design of the velocity and shear distribution for any type of flow by using real data, and the velocity and shear distribution for any type of flow by using real data. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       |                    | √          |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                               | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                   |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                   |                    |                                       | Tutorial | Practical / Lab |
| 1        | Studying the basic principles of open channel hydraulics such as fluid properties and different types of flow, and the energy equation and pressure distribution for open channel | 3                  | 2                                     | 0        | 1               |

|       |                                                                                                                                                                                                                                                                                                          |   |   |   |   |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|       | Course Introduction and Demonstration of Hydraulic Models                                                                                                                                                                                                                                                |   |   |   |   |
| 2     | Studying the different canal cross section properties, and the most common shapes for canals and the basic equations of flow                                                                                                                                                                             | 3 | 2 | 0 | 1 |
| 3     | Studying the different canal cross section properties, and the most common shapes for canals and the basic equations of flow and Studying the water depth for maximum velocity and discharge, deep and shallow sections<br>mini project: pump design and specification. Provide guidelines and examples. | 3 | 2 | 0 | 1 |
| 4     | Studying the compound section<br>Project Work, Feedback Sessions, and Final Presentations.                                                                                                                                                                                                               | 3 | 2 | 0 | 1 |
| 5     | Velocity distribution in Laminar flow.                                                                                                                                                                                                                                                                   | 3 | 2 | 0 | 1 |
| 6     | Velocity distribution in turbulent flow and introduction to shear distribution.                                                                                                                                                                                                                          | 3 | 2 | 0 | 1 |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                                                                                                                             |   |   |   |   |
| 8     | Shear distribution and design of stable section) + Quiz.                                                                                                                                                                                                                                                 | 3 | 2 | 0 | 1 |
| 9     | Introduction to non-uniform flow and its equations. Application for non-uniform flow, and Introduction to Rapidly varied flow.                                                                                                                                                                           | 3 | 2 | 0 | 1 |
| 10    | Studying of the hydraulic jump properties and introduction of gradually varied flow and its equations.                                                                                                                                                                                                   | 3 | 2 | 0 | 1 |
| 11    | Studying the different profiles for GVF.) + Quiz                                                                                                                                                                                                                                                         | 3 | 2 | 0 | 1 |
| 12    | Computing the lengths of GVF profiles.                                                                                                                                                                                                                                                                   | 3 | 2 | 0 | 1 |
| 13    | Introduction to dimensional analysis and modeling in open channel flow                                                                                                                                                                                                                                   | 3 | 2 | 0 | 1 |
| 14    | Studying flow measurements techniques + Revision                                                                                                                                                                                                                                                         | 3 | 2 | 0 | 1 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                                                                                                                       |   |   |   |   |

**Experiment Topics: (If any)**

| Serial | Experiment                                   |
|--------|----------------------------------------------|
| 1      | Experimental work for open channel hydraulic |

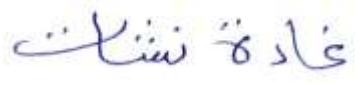
**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 8                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project          | 10                              | 15            | 15%                              |
| 6   | Final Practical                | 13                              | 5             | 5 %                              |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>S.K. Sharma, Hydraulic Structures Design of Irrigation Structures, RSM Press, ISBN-13: 978-9352533770, January 2017.</li> <li>Irrigation Engineering and Hydraulic, Dr. S.K.Sharma, S.Chand PUBLISHING, 12171, NEW DELHI, 2016</li> <li>Civil Engineering Hydraulics: Essential Theory with Worked Examples, Martin Marriott, May 2, 2016.</li> </ul> |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>C. Nalluri, Martin Marriott, Civil Engineering Hydraulics, Wiley – Blackwell, 5th. Ed., 2009.</li> </ul>                                                                                                                                                                                                                                              |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://www.hydraulics.org/">https://www.hydraulics.org/</a></li> </ul>                                                                                                                                                                                                                                                                      |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Supportive facilities &amp; equipment</b>                     | <b>Devices/Instruments</b>                                                                                          | Hydraulic laboratory                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | <b>Supplies</b>                                                                                                     | Data Show, White Board – MS Team                                                                                                                                                                                                                                                                                                                                                             |
|                                                                  | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                           |

|                                      |                        |    |
|--------------------------------------|------------------------|----|
| for<br>teaching<br>and<br>learning * | Skill Labs/ Simulators | -- |
|                                      | Virtual Labs           | -- |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | Ass. Prof. Samah Hassan                                                           | Dr. Ghada Nashaat Mohamed                                                          |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Theory of Structures (2)</b>           |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 143</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Types of structures, supports and loads. Idealization of structures and loads. Geometric stability and determinacy, analysis of determinate trusses, beams, plane frames and arches; reaction computation; axial force, shear force and bending moment diagrams. Internal force releases. Load-shear-moment relationships. Differential equation of elastic curve. Deflections by integration, moment-area, conjugate-beam and virtual work methods. Influence lines of determinate structures.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                         |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(A1, A2, A9, B1)</b>                                                          |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                         |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                             |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.                                                                                                                                                                                                                                                                            | <b>LO1</b>                                                         | Visualize a rather comprehensive introduction of evaluation of internal forces equations for determinate beams under different kinds of loadings        |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO2</b>                                                         | Develop the suitable technique to calculate the reactions, normal force, shear force and bending moment diagrams for statically determinate structures. |
| <b>A9</b>                                                                        | Use creative innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                                | <b>LO3</b>                                                         | Examine the creative solution for evaluation of internal forces equations for determinate structures under different kinds.                             |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                                                         | Identify a full range of civil engineering concept and techniques by structure analysis.                                                                |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO5</b>                                                         | . Define properties technology for construction analysis by structural analysis.                                                                        |



#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        |            | √                     | √                  | √          |                |            | √             |                    | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                             | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                 |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                 |                    |                                       | Tutorial | Practical / Lab |
| 1        | Stability and determinacy of structures. Identify key topics and prepare supplementary materials for students.                                  | 3                  | 2                                     | 1        | --              |
| 2        | Evaluation of internal forces equations for determinate beams under different kinds of loadings.                                                | 3                  | 2                                     | 1        | --              |
| 3        | Reactions, normal force and shear force diagrams for statically determinate beams.                                                              | 3                  | 2                                     | 1        | --              |
| 4        | Reactions and bending moment diagram for statically determinate beams. Release weekly videos and exercises and encourage student participation. | 3                  | 2                                     | 1        | --              |
| 5        | Reactions, normal force, shear force and bending moment diagrams for                                                                            | 3                  | 2                                     | 1        | --              |

|       |                                                                                                                                                                                        |   |   |   |    |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
|       | statically determinate beams under different kinds of loadings.                                                                                                                        |   |   |   |    |
| 6     | Normal force, shear force, and bending moment diagrams for statically determinate frames. <a href="#">Release weekly videos and exercises and encourage student participation.</a>     | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                           |   |   |   |    |
| 8     | Bending moment diagrams for statically determinate frames under different kinds of loadings.                                                                                           | 3 | 2 | 1 | -- |
| 9     | Solution and internal force diagrams for trussed-beams, frames with links or ties, and for closed frames. <a href="#">Analyze student engagement data and adjust content delivery.</a> | 3 | 2 | 1 | -- |
| 10    | Reactions and Normal force for statically determinate trusses by method of joints. <a href="#">Analyze student engagement data and adjust content delivery.</a>                        | 3 | 2 | 1 | -- |
| 11    | Normal force for statically determinate trusses by method of sections.                                                                                                                 | 3 | 2 | 1 | -- |
| 12    | Reactions, normal force, shear force, and bending moment for statically determinate parabolic arches. <a href="#">Conduct a survey to evaluate effectiveness and gather feedback.</a>  | 3 | 2 | 1 | -- |
| 13    | Reactions, Normal force, shear force, and bending moment for statically determinate circular arches.                                                                                   | 3 | 2 | 1 | -- |
| 14    | Introduction of influence lines for internal forces of simple beam                                                                                                                     | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                     |   |   |   |    |

### **5- Methods of students' assessment:**

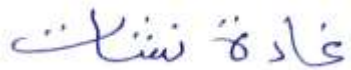
| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 4                               | 10            | 10%                              |

|   |                                           |        |    |      |
|---|-------------------------------------------|--------|----|------|
| 2 | Exam 2 written (Semester work)            | 9      | 10 | 10%  |
| 3 | Midterm exam                              | 7      | 20 | 20 % |
| 4 | Final Written Exam                        | 15, 16 | 40 | 40 % |
| 5 | Assignments / Project /Portfolio/ Logbook | 13     | 20 | 20%  |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <b>1- <u>Lecture notes</u></b> available (handed to students part by part).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Theory of structures Vol. 1, W.M.El-Dakhakhni, Dar El-Maaref, Cairo &amp; Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> <li>• Advanced Theory of Structure, V.N.VAZIRAMI, Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> <li>• Analysis of Structures, V.N.VAZIRAMI, Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> <li>• Structural Analysis, J.C.MCCO., Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> <li>• Theory of Structures, R.S.KHURMI, Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> <li>• Generative Structural Design Integrating BIM and Diffusion, Zhili He, Yu-Hsing Wang, Jian Zhang, 2023</li> <li>• “Performance-Based Optimization of 2D Reinforced Concrete Moment Frames through Pushover Analysis and ABC Optimization Algorithm”, Saba Faghirnejad, 2023</li> </ul> |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>• <a href="https://courses.structure.education/collections">https://courses.structure.education/collections</a></li> <li>• <a href="http://www.experiencefestival.com/structural_analysis_-_mechanics_of_materials_methods">http://www.experiencefestival.com/structural_analysis_-_mechanics_of_materials_methods</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|                                                                          |                                                    |                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <ul style="list-style-type: none"> <li>• <a href="https://arxiv.org/abs/2311.04052">https://arxiv.org/abs/2311.04052</a></li> <li>• <a href="https://arxiv.org/abs/2312.09450">https://arxiv.org/abs/2312.09450</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                         |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | MS Team                                                                                                                                                                                                                        |
|                                                                          | <b>Supplies</b>                                    | ---                                                                                                                                                                                                                            |
|                                                                          | <b>Electronic Programs</b>                         | ---                                                                                                                                                                                                                            |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | ---                                                                                                                                                                                                                            |
|                                                                          | <b>Virtual Labs</b>                                | ---                                                                                                                                                                                                                            |
|                                                                          | <b>Other</b> (to be mentioned)                     | ---                                                                                                                                                                                                                            |

|                  | <b>Course Coordinator</b>                                                          | <b>Program Coordinator</b>                                                           |
|------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Morcos Farid Samaan</b>                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1-Basic information:**

|                                                                                                                 |                                                |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Properties and Testing of Materials (3)</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 144</b>                                 |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                             | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <u>2</u>                                       | <u>1</u>         |                        | <u>3</u>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                     |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                                  |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                              |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>          |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Sherif H. Al-Tersawy                     |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department      |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                             |                  |                        |              |

### **2-Course Overview (Brief summary of scientific content):**

Metals: Hardness, Testing in Impact, Fatigue and Creep, Non-destructive tests, welding: Types, Defects and Testing. Selected topics from: Atomic Arrangements, Structural imperfections, Single phase metals, Binary alloys, and Iron carbon alloys, Heat treatment of Carbon steels. Cast iron, copper and copper alloys, Experimental Stress Analysis.

### 3-Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><br><b>A1, A2, A4, A10, B1</b> |                                                                                                                                                                                                                                 | <b>Course Learning Outcomes</b><br><br><b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Code</b>                                                                                                        | <b>Text</b>                                                                                                                                                                                                                     | <b>Code</b>                                                                                               | <b>Text</b>                                                                                                                    |
| <b>A1</b>                                                                                                          | Identify, and solve complex engineering problems by applying, basic science, and mathematics.                                                                                                                                   | <b>LO1</b>                                                                                                | Identify basic fundamentals of destructive and nondestructive tests.                                                           |
|                                                                                                                    |                                                                                                                                                                                                                                 | <b>LO2</b>                                                                                                | Identify difference between short and long period tests.                                                                       |
|                                                                                                                    |                                                                                                                                                                                                                                 | <b>LO3</b>                                                                                                | Identify different types of welding.                                                                                           |
|                                                                                                                    |                                                                                                                                                                                                                                 | <b>LO4</b>                                                                                                | Recognize the different types of atomic structures, imperfections, and phases of materials.                                    |
|                                                                                                                    |                                                                                                                                                                                                                                 | <b>LO5</b>                                                                                                | Recognize the different types of Carbon-steel and copper alloys.                                                               |
| <b>A2</b>                                                                                                          | Develop and conduct appropriate experimentation, analyze and interpret data, assess and evaluate findings, and engineering judgment to draw conclusions.                                                                        | <b>LO6</b>                                                                                                | Conduct non-destructive and destructive tests on materials.                                                                    |
|                                                                                                                    |                                                                                                                                                                                                                                 | <b>LO7</b>                                                                                                | Assess and evaluate the materials under specs and codes requirements.                                                          |
|                                                                                                                    |                                                                                                                                                                                                                                 | <b>LO8</b>                                                                                                | Analyze and interpret stress and strain data.                                                                                  |
| <b>A4</b>                                                                                                          | Utilize engineering technologies, codes of practice and standards, quality guidelines, health and safety requirements.                                                                                                          | <b>LO9</b>                                                                                                | Utilize codes, and standards in the evaluation and choice of materials ingredients.                                            |
| <b>A10</b>                                                                                                         | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.                                                                                                                                     | <b>LO10</b>                                                                                               | Develop a comprehensive understanding of the influence of material's microstructure on its mechanical and physical properties. |
| <b>B1</b>                                                                                                          | Select appropriate and sustainable technologies for retrofitting of buildings; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques. | <b>LO11</b>                                                                                               | Select material properties according to design requirements.                                                                   |
|                                                                                                                    |                                                                                                                                                                                                                                 | <b>LO12</b>                                                                                               | Use materials testing to meet the requirements Properties and Strength of materials for construction elements.                 |

#### 4-Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | ✓                    |                        |            |                       | ✓                  |            |                |            | ✓             | ✓                  |                                          |              | ✓          | ✓               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                    | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                        |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                        |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction                                                                                           | 3                  | 2                                     | --       | 1               |
| 2        | Microstructure of cementitious materials.                                                              | 3                  | 2                                     | --       | 1               |
| 3        | Microstructure of cementitious materials (SM, BSE, EDEX)<br><a href="#">Self-Learning Guide to SEM</a> | 3                  | 2                                     | --       | 1               |
| 4        | Destructive tests (Fatigue test)                                                                       | 3                  | 2                                     | --       | 1               |
| 5        | Long term test (Creep)                                                                                 | 3                  | 2                                     | --       | 1               |
| 6        | Non-destructive tests                                                                                  | 3                  | 2                                     | --       | 1               |
| 7        | Revision and Mid Exam                                                                                  |                    |                                       |          |                 |

|       |                                                                                 |   |   |    |   |
|-------|---------------------------------------------------------------------------------|---|---|----|---|
| 8     | Non-destructive tests                                                           | 3 | 2 | -- | 1 |
| 9     | Atomic Arrangements                                                             | 3 | 2 | -- | 1 |
| 10    | Structural imperfections and Single phase metals.                               | 3 | 2 | -- | 1 |
| 11    | Iron carbon alloys, Heat treatment of Carbon steel and the iron carbon diagram. | 3 | 2 | -- | 1 |
| 12    | Iron carbon alloys, Heat treatment of Carbon steel and the iron carbon diagram. | 3 | 2 | -- | 1 |
| 13    | Brief introduction about experimental stress analysis.                          | 3 | 2 | -- | 1 |
| 14    | Welding types, specs, defects and testing.                                      | 3 | 2 | -- | 1 |
| 15,16 | <b>Final Exam.</b>                                                              |   |   |    |   |

### **Experiment Topics: (If any)**

| Serial | Experiment         |
|--------|--------------------|
| 1      | Hardness of Metals |
| 2      | Impact of Metals   |

### **5-Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            | 3                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work)            | 6                               | 10            | 10 %                             |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 5   | Final Practical/Clinical/... Exam         | 14                              | 5             | 5%                               |
| 6   | Final Oral Exam                           | 14                              | 5             | 5%                               |
| 7   | Assignments / Project /Portfolio/ Logbook | 10                              | 10            | 10%                              |



### **6-Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | W.d.callister, david g. Rethwisch, Materials science and engineering an introduction, Wiley , ISBN: 14485.                                                                                                             |
|                                                                          | <b>Other References</b>                                                                                             | -B.onouye, Statics and strength of materials for architecture and building construction, Pearson, ISBN 14712, 2007.<br>-Soutso M., construction materials, Routledge (Taylor&Francis Group), ISBN 9781498741101, 2018. |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://education.jlab.org/itselemental/">https://education.jlab.org/itselemental/</a>                                                                                                                        |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB – Microsoft office                                                                                                                                                                                                 |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | <b>Data Show, White Board</b>                                                                                                                                                                                          |
|                                                                          | <b>Supplies</b>                                                                                                     | <b>Testing Specimens (Metals), Concrete Cubes and Cylinders.</b>                                                                                                                                                       |
|                                                                          | <b>Electronic Programs</b>                                                                                          | <b>Image J</b>                                                                                                                                                                                                         |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | -                                                                                                                                                                                                                      |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | -                                                                                                                                                                                                                      |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | -                                                                                                                                                                                                                      |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Prof. Sherif H. Al-Tersawy</b>                                                   | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Advances in Computer Programming</b>   |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CSC 101</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 1                                         | 3                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Principles of designing a simple program - The basic ideas of uses of the computer in programming - The basic ideas of matlab language - How to write a complete program with high level language matlab. How to design, code, debug, and document program laboratory assignments - The syntax of writing any program by matlab language.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A10, B1</b>                                                               |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                                  |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                                      |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                          | <b>LO1</b>                                                         | Develop MATLAB scripts to automate the setup and execution of experiments and simulations specific to civil engineering problems                                                                 |
| <b>A10</b>                                                                       | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.                                                                                                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Apply MATLAB programming skills to solve civil engineering problems such as structural analysis, fluid mechanics simulations, and geotechnical data processing                                   |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics | <b>LO3</b>                                                         | Implement MATLAB workflows to simulate properties and strength of materials (e.g., stress-strain, nonlinear material models) and to assess structural integrity under design and extreme events. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       | √                  | √          |                |            | √             |                    |                                          |              |            | √               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                    | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                        |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                        |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to programing                                                                                             | 4                  | 1                                     | --       | 3               |
| 2        | MATLAB overview                                                                                                        | 4                  | 1                                     | --       | 3               |
| 3        | Simple math operations                                                                                                 | 4                  | 1                                     | --       | 3               |
| 4        | Elementary math built-in functions                                                                                     | 4                  | 1                                     | --       | 3               |
| 5        | Application of programing in civil Eng                                                                                 | 4                  | 1                                     | --       | 3               |
| 6        | function: switch, catch,max,min, mean                                                                                  | 4                  | 1                                     | --       | 3               |
| 7        | Revision and Mid Exam                                                                                                  |                    |                                       |          |                 |
| 8        | If function and its application at programing in civil Eng<br>Increase the number and depth of practical applications. | 4                  | 1                                     | --       | 3               |
| 9        | Matrix operation                                                                                                       | 4                  | 1                                     | --       | 3               |
| 10       | Application of programing in civil Eng                                                                                 | 4                  | 1                                     | --       | 3               |

|       |                                                                                                                                                     |   |   |    |   |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|---|
| 11    | Programming: for and while loops                                                                                                                    | 4 | 1 | -- | 3 |
| 12    | Plotting and data representation                                                                                                                    | 4 | 1 | -- | 3 |
| 13    | Application of programing in civil Eng.                                                                                                             | 4 | 1 | -- | 3 |
| 14    | Application of programing in civil Eng.<br>Students are assigned to conduct a self-learning project and increase their application of the software. | 4 | 1 | -- | 3 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                  |   |   |    |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 6                               | 10            | 10 %                             |
| 2   | Quiz 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 30            | 30 %                             |
| 4   | Final Written Exam             | 15, 16                          | 30            | 30 %                             |
| 5   | Assignments                    | weekly                          | 20            | 20 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• STRUCTURAL ANALYSIS, ASLAM KASSIMALI, CRC PRESS, 12289, N.YORK, 2020.</li> <li>• Theory of structures Vol. 2, El-Dakhakhni, Dar El-Maaref, Cairo – 2018</li> <li>• PROGRAMMING THE DYNAMIC ANALYSIS OF STRUCTURE, Bhatt, P. (2002), (N. York, Ed.), 11060</li> <li>• ANALYSIS OF STRUCTURES V1, V2, 2002, V.N.VAZIRANI, 1179 &amp; 8343</li> </ul> |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Dynamics of structures – Patrick paultr – 2010 – Newdelhi.</li> </ul>                                                                                                                                                                                                                                                                              |

|                                                                          |                                                    |                                                                                                                                                             |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <ul style="list-style-type: none"> <li>Matrix Structural Analysis, 2nd Edition, William McGuire, Richard H. Gallagher, Ronald D. Ziemian, (2000)</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://www.mathworks.com/">https://www.mathworks.com/</a>                                                                                         |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                      |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Computer lab                                                                                                                                                |
|                                                                          | <b>Supplies</b>                                    | --                                                                                                                                                          |
|                                                                          | <b>Electronic Programs</b>                         | <b>MATLAB</b>                                                                                                                                               |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                          |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                          |
|                                                                          | <b>Other</b> (to be mentioned)                     | --                                                                                                                                                          |

|                  | <b>Course Coordinator</b>                                                          | <b>Program Coordinator</b>                                                           |
|------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Morcos Farid Samaan</b>                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Technical Report Writing</b>           |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MNG 103</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Mechanical Engineering</b>             |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>1</b>                                  | <b>2</b>         | <b>--</b>              | <b>3</b>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b>Mechanical Engineering</b>             |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Dr. Mohamed Elsayed</b>                |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | 8/12/2025                                 |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Essential elements of a technical report: Abstract - Summary - Contents - Objectives - Details of the report including figures, images, video ...etc, - Conclusions - Recommendations - References using a standard format and the different electronic sources. Report Classification: Technical (Requirement specification, Analysis, Design, and Implementation). Administrative (Directed to different operational and management levels). Levels of confidentiality for the different reports. Report Composition: Logical presentation of the report and coordination between its components. Importance of using correct grammar and punctuation. Enhancing

communication effectiveness by the use of different media. Report Implementation: Use of the appropriate software packages including any graphics or multimedia packages.

### **3. Course Learning Outcomes CLOs:**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                      | <b>Course Learning Outcomes</b>                                    |                                                                                                                                     |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>(A5, A8, A10)</b>                                                             |                                                                                                                      | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                     |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                          | <b>Code</b>                                                        | <b>Text</b>                                                                                                                         |
| <b>A5.</b>                                                                       | Practice research techniques and methods of investigation as an inherent part of learning.                           | <b>LO1</b>                                                         | Identify the purpose, characteristics, and structure of technical writing, and distinguish it from general writing.                 |
|                                                                                  |                                                                                                                      | <b>LO2</b>                                                         | Differentiate between the key components of technical reports, CVs, letters, and technical presentations.                           |
| <b>A8</b>                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools. | <b>LO3</b>                                                         | Apply the principles of technical writing to produce structured technical documents such as reports, CVs, and presentations.        |
| <b>A10</b>                                                                       | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.                          | <b>LO4</b>                                                         | Analyze examples of technical documents through independent research to enhance communication skills and promote lifelong learning. |



#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | ✓                    | ✓                      |            |                       | ✓                  | ✓          |                |            | ✓             |                    |                                          |              | ✓          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                              | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                  |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                  |                    |                                       | Tutorial | Practical Lab / |
| 1        | Introduction of technical writing                                                                                                | 3                  | 1                                     | 2        | -               |
| 2        | Some Elements of Technical Reports (cover page, title page, abstract, acknowledgement, dedication and summary)                   | 3                  | 1                                     | 2        | -               |
| 3        | Some Elements of Technical Reports (tables of contents, list of figures, list of tables, Nomenclature, Abbreviation and Acronym) | 3                  | 1                                     | 2        | -               |
| 4        | Some Elements of Technical Reports (Introductory chapters(s), Literature Review, Central chapters,)                              | 3                  | 1                                     | 2        | -               |
| 5        | Some Elements of Technical Reports (Microstructure, Conclusions, Tables and Figures, Appendices)                                 | 3                  | 1                                     | 2        | -               |

|       |                                                                                                              |   |   |   |   |
|-------|--------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 6     | Some Elements of Technical Reports (References (Harvard method))Bibliography, Plagiarism, Style)             | 3 | 1 | 2 | - |
| 7     | Punctuation, Layout and Equations.                                                                           | 3 | 1 | 2 | - |
| 8     | <b>Revision and Mid Exam</b>                                                                                 |   |   |   |   |
| 9     | CV (Curriculum Vitae)                                                                                        | 3 | 1 | 2 | - |
| 10    | Letters                                                                                                      | 3 | 1 | 2 | - |
| 11    | Technical Presentations                                                                                      | 3 | 1 | 2 | - |
| 12    | Submitting a technical report from the students and evaluating the report according to the explanation       | 3 | 1 | 2 | - |
| 13    | Submitting a technical presentation from the students and evaluating the report according to the explanation | 3 | 1 | 2 | - |
| 14    | Submitting a technical presentation from the students and evaluating the report according to the explanation | 3 | 1 | 2 | - |
| 15,16 | <b>Final Exam.</b>                                                                                           |   |   |   |   |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods *                           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|------------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Technical Report (Semester work or quiz)       | 9                               | 15            | 15%                              |
| 2   | Technical presentation (Semester work or quiz) | 11, 12                          | 15            | 15%                              |
| 3   | CV & letter                                    | 10                              | 10            | 10%                              |
| 4   | Midterm Exam                                   | 8                               | 20            | 20 %                             |
| 5   | Final Written Exam                             | 15, 16                          | 40            | 40 %                             |

#### **6- Learning Resources and Supportive Facilities \***

|                                              |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | -The Oracle Corporation, "Corporate citizenship report 2023," Oracle, Redwood Shores, CA, USA, 2023. Accessed: Dec. 5, 2023. [Online]. Available: <a href="http://www.oracle.com/us/corporate/citizenship/corporate-citizenship-report-2563684">http://www.oracle.com/us/corporate/citizenship/corporate-citizenship-report-2563684</a> |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                       |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>references, etc.) *</b>                                               |                                                    | Research and Technical Writing for Science and - Engineering, by Meikang Qiu, Han Qiu, Yi Zeng, 2022. |
|                                                                          | <b>Other References</b>                            | M. Markel, Technical Communication, 11th ed. Boston, MA: Bedford/St. Martin's, 2017.                  |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | Microsoft teams                                                                                       |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data- show and laptop.                                                                                |
|                                                                          | <b>Supplies</b>                                    | White board                                                                                           |
|                                                                          | <b>Electronic Programs</b>                         | N/A                                                                                                   |
|                                                                          | <b>Other</b> (to be mentioned)                     | N/A                                                                                                   |

|                  | <b>Course Coordinator</b>  | <b>Program Coordinator</b> |
|------------------|----------------------------|----------------------------|
| <b>Name</b>      | <b>Dr. Mohamed Elsayed</b> | <b>Dr. Mohamed Ashraf</b>  |
| <b>Signature</b> | محمد السيد                 | محمد اشرف                  |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                                              |  |  |  |                            |
|----------------------------------------------|--|--|--|----------------------------|
| اسم المقرر: (تبعاً لما ورد باللائحة)         |  |  |  | مقدمة في تاريخ الحضارات    |
| كود المقرر: (تبعاً لما ورد باللائحة)         |  |  |  | <b>HUM 101</b>             |
| القسم/الأقسام العلمية التي شاركت في التدريس: |  |  |  | العلوم الأساسية            |
| إجمالي عدد الساعات المعتمدة للمقرر:          |  |  |  | إجمالي                     |
| (تبعاً لما ورد باللائحة)                     |  |  |  | أخرى (تحدد)                |
| نوع المقرر:                                  |  |  |  | عملي                       |
| المستوى الدراسي الذي قدم فيه المقرر:         |  |  |  | نظري                       |
| البرنامج الأكاديمي:                          |  |  |  | 2                          |
| المعهد:                                      |  |  |  | اختياري                    |
| اسم منسق المقرر:                             |  |  |  | <b>JUNIOR</b>              |
| جهة مناقشة واعتماد تقرير المقرر:             |  |  |  | العلوم الأساسية            |
| تاريخ اعتماد تقرير المقرر:                   |  |  |  | المعهد التكنولوجي العالي   |
|                                              |  |  |  | أ.م.د. وليد رضوان          |
|                                              |  |  |  | مجلس القسم العلمي للبرنامج |
|                                              |  |  |  | <b>7/26/2025</b>           |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

مفهوم الحضارة (الثقافة والحضارة – التاريخ والحضارة) – أصول الحضارة الإنسانية في العصور القديمة (البدايات الحضارية الأولى – الثقافة والحضارة في الشرق القديم، وفي الغرب القديم "اليونان والرومان") – الحضارة والثقافة في العصور الوسطى (المسيحية – الإقطاع – العرب – العصور الإسلامية) – الحضارة في العصور الحديثة (النهضة – الإصلاح الديني – تقدم العلوم – الفلسفة والآداب والفنون).

### 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                                                                           |       | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)                                                |       |
|-----------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على                                                |       | (A2- A5- A7-A9)                                                                                                                                        |       |
| النص                                                                                          | الكود | النص                                                                                                                                                   | الكود |
| يشرح المعلومات والأحداث التي تتعلق بمفهوم الحضارة وأصولها الإنسانية في العصور المختلفة.       | LO 1  | تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج | A 2   |
| يتعرف على أهم المؤثرات التي ساهمت في الحضارة والثقافة في العصور المتعاقبة .                   | LO 2  |                                                                                                                                                        |       |
| يستنتج مدى التأثير والتأثر بالأحداث التي مرت بها الحضارات ويبين الإنجازات والإخفاقات كل حقبة. | LO 3  |                                                                                                                                                        |       |
| يقيس تطور وتأثير وتأثر الثقافة والحضارة في العصور المختلفة .                                  | LO 4  |                                                                                                                                                        |       |
| يستخدم المنهج التاريخي لتناول الأحداث الحضارية الهامة في كل عصر و مصادر تلك الفترة.           | LO 5  |                                                                                                                                                        |       |
| يستقرئ الربط بين تطور الأحداث و الملابس الحضارية التي تتناول تلك العصور ومصادرها.             | LO 6  |                                                                                                                                                        |       |
| يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية.                                         | LO 7  | ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.                                                                                           | A 5   |
| يظهر مهارات إدارة الوقت بكفاءة.                                                               | LO 8  |                                                                                                                                                        |       |
| تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق.                 | LO 9  | العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات                                                                                          | A 7   |
| القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية.                                 | LO10  | إستخدام التفكير الإبداعي والمبتكر والمرن واكتساب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها.                                   | A 9   |
| توخي السلوك الطيب والاعتداء بالقذوة الحسنة.                                                   | LO10  |                                                                                                                                                        |       |

### 4 طرق التعليم والتعلم للمقرر:

| استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                   |                    |                           | التدريس الغير مباشر |               |                    |                  |                  |                         |             |                         | التدريس المباشر                      |              |                           |           |
|------------------------------------------------|-------------------|--------------------|---------------------------|---------------------|---------------|--------------------|------------------|------------------|-------------------------|-------------|-------------------------|--------------------------------------|--------------|---------------------------|-----------|
| ✓                                              | ✓                 | ✓                  | ✓                         | ✓                   | ✓             | ✓                  | ✓                | ✓                | ✓                       | ✓           | ✓                       | ✓                                    | ✓            |                           |           |
| النقاء الإصطناعي في التعليم                    | التعلم الإلكتروني | المعامل الافتراضية | برامج المحاكاة أو النمذجة | التعلم بالإكتشاف    | التعلم الذاتي | الزيارات الميدانية | التدريب الميداني | الحوار والمناقشة | كتابة التقارير /الأبحاث | حل المشكلات | استراتيجية دراسة الحالة | التعلم القائم على المشروعات الجامعية | العصف الذهني | التمارين العملية والتجارب | المحاضرات |

### الجدول الدراسي للمقرر:

| رقم الأسبوع الدراسي | المحتوى العلمي للمقرر (موضوعات المقرر)                                                                              |        | إجمالي عدد الساعات الأسبوعية | عدد ساعات التعلم المتوقعة |       |
|---------------------|---------------------------------------------------------------------------------------------------------------------|--------|------------------------------|---------------------------|-------|
|                     |                                                                                                                     |        |                              | تدريس نظري                | تدريب |
|                     |                                                                                                                     |        |                              |                           |       |
|                     | عملية                                                                                                               | تمارين |                              |                           |       |
| 1                   | تعريف بالمقرر الدراسي ومقدمة عامه.                                                                                  | 2      | 2                            | 0                         | 0     |
| 2                   | مفهوم الحضارة والتاريخ والعلاقة بينهما.                                                                             | 2      | 2                            | 0                         | 0     |
| 3                   | مفهوم الحضارة والتاريخ والعلاقة بينهما .                                                                            | 2      | 2                            | 0                         | 0     |
| 4                   | أصول الحضارة الإنسانية في العصور القديمة.                                                                           | 2      | 2                            | 0                         | 0     |
| 5                   | الحضارة الإنسانية حيث الثقافة والحضارة في الشرق القديم .                                                            | 2      | 2                            | 0                         | 0     |
| 6                   | أصول الحضارة الإنسانية في العصور القديمة، من حيث الثقافة و الحضارة في الغرب القديم ، لا سيما عند اليونان والرومان . | 2      | 2                            | 0                         | 0     |
| 7                   | مراجعة وامتحان منتصف الفصل الدراسي                                                                                  |        |                              |                           |       |
| 8                   | دور الحركة الوطنية في التصدي للاحتلال. (1)                                                                          | 2      | 2                            | 0                         | 0     |
| 9                   | دور الحركة الوطنية في التصدي للاحتلال. (2)                                                                          | 2      | 2                            | 0                         | 0     |
| 10                  | المظاهرات والثورات المناهضة للاحتلال وخاصة ثورة 1919 ونتائجها.                                                      | 2      | 2                            | 0                         | 0     |
| 11                  | نذر الحرب العالمية الثانية ومعاهدة 1936 والعدوان الثلاثي.                                                           | 2      | 2                            | 0                         | 0     |
| 12                  | الأحداث التي مهدت لثورة 23 يوليو 1952.                                                                              | 2      | 2                            | 0                         | 0     |
| 13                  | تحليل أهداف ثورة 23 يوليو 1952.                                                                                     | 2      | 2                            | 0                         | 0     |
| 14                  | مراجعة عامة                                                                                                         | 2      | 2                            | 0                         | 0     |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *                                 | توقيت التقييم المتوقع<br>(رقم الأسبوع الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|-----------------------------------------------|------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة)                   | 5                                              | 10            | 10%                                     |
| 2 | امتحان 2 تحريري (أعمال سنة)                   | 9                                              | 10            | 10%                                     |
| 3 | امتحان منتصف الفصل الدراسي                    | 7                                              | 20            | 20%                                     |
| 4 | امتحان نهائي تحريري                           | 14                                             | 40            | 40%                                     |
| 5 | امتحان نهائي عملي                             | لا يوجد                                        | ----          | -----                                   |
| 6 | امتحان نهائي شفهي                             | 11                                             | 10            | 10%                                     |
| 7 | تكاليفات / مشروع / ملف الإنجاز / كتيب الأنشطة | 8                                              | 10            | 10%                                     |
| 8 | تدريب ميداني                                  | لا يوجد                                        | -----         | -----                                   |
| 9 | أخرى (تذكر)                                   | لا يوجد                                        | -----         | -----                                   |

## 6- مصادر التعلم والتسهيلات المادية:

| المرجع الأساسي للمقرر                                                                                    | مصادر التعلم<br>(الكتب والمراجع العلمية وغيرها)<br>* |
|----------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| خالد الشربيني ، مرفت ذكي: مقدمة في تاريخ الحضارات، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان، 2019 | المراجع الأخرى                                       |
| 1- أحمد عبد الرازق، الحضارة الإسلامية في العصور الوسطى، القاهرة، 2004.                                   |                                                      |
| 2- بدر نبيل ملحم: تاريخ الحضارات القديمة، دار الإعصار العلمي للنشر والتوزيع، 2015.                       |                                                      |
| 3- رالف لينتون، شجرة الحضارة، ترجمة أحمد فخري، (3 أجزاء)، المركز القومي للترجمة 2010                     | المصادر الإلكترونية<br>(لابد من إضافة الروابط)       |
| 4- رمسيس رياض، جورج صليب: الحضارات القديمة، مصر والشرق. وكالة الصحافة العربية، 2020                      |                                                      |
| 1- <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a>                             |                                                      |
| 2- <a href="http://www.du.edu.eg/">http://www.du.edu.eg/</a>                                             | المنصة التعليمية<br>(لابد من إضافة الرابط)           |
| 3- <a href="https://www.youtube.com/">https://www.youtube.com/</a>                                       |                                                      |
| <a href="https://www.ekb.eg/ar/home">https://www.ekb.eg/ar/home</a>                                      |                                                      |
| (داتا شو) وجهاز كمبيوتر محمول.                                                                           | التجهيزات التعليمية<br>المساندة للتعليم والتعلم *    |
| قاعة محاضرات مجهزة                                                                                       |                                                      |
| -----                                                                                                    |                                                      |
| -----                                                                                                    |                                                      |
| -----                                                                                                    |                                                      |
| -----                                                                                                    |                                                      |
| أخرى (تذكر)                                                                                              |                                                      |

| منسق البرنامج                                                                     | منسق المقرر                                                                        |         |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------|
| أ.د. أحمد عبد الغفار                                                              | أ.م.د. وليد رضوان                                                                  | الإسم   |
|  |  | التوقيع |



|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |      |             |        |                                                                 |
|----------------------------|------|-------------|--------|-----------------------------------------------------------------|
| تاريخ مصر الحديث           |      |             |        | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| <b>HUM 102</b>             |      |             |        | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |      |             |        | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| نظري                       | عملي | اخرى (تحدد) | إجمالي | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 2                          |      |             | 2      |                                                                 |
| اختياري                    |      |             |        | نوع المقرر:                                                     |
| <b>JUNIOR</b>              |      |             |        | المستوى الدراسي الذي قدم فيه المقرر:                            |
| العلوم الأساسية            |      |             |        | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |      |             |        | المعهد:                                                         |
| أ.م.د. وليد رضوان          |      |             |        | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |      |             |        | جهة مناقشة واعتماد تقرير المقرر:                                |
| <b>7/26/2025</b>           |      |             |        | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

مصر تحت الحكم العثماني (1517 – 1798) (الفتح – الحكم والإدارة – الأوضاع الاقتصادية والاجتماعية) – الغزو الفرنسي لمصر وآثاره (1798 – 1801) (الاحتلال – الحكم والإدارة – المقاومة الوطنية – فشل المشروع الاستعماري – نتائج الاحتلال) – نظام محمد علي (1805 – 1848) (الصراع السياسي وتولية محمد علي – بناء الدولة الحديثة – السياسة الخارجية - ) – الحركة الوطنية والثورة العربية (خلفاء محمد علي – عصر إسماعيل – الحركة الوطنية والثورة العربية) – مصر في عهد الاحتلال البريطاني (1882- 1914) (سياسة الاحتلال – انبعاث الحركة الوطنية) – مصر في عهد الحماية البريطانية والحرب العالمية الأولى – تأليف الوفد وقيام ثورة 1919 – تصريح 28 فبراير 1922 – دستور 1923 – تطور القضية الوطنية ومعاهدة 1936- مصر خلال الحرب العالمية الثانية) – أزمت مصر السياسية والاجتماعية والطريق إلى ثورة يوليو – الثورة وتغير النظام السياسي – الجلاء البريطاني 1954 – العدوان الثلاثي 1956.

## 3- نواتج التعلم للمقرر:

#### اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                                                                                |       | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)                                                 |       |
|----------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على                                                     |       | (A2- A3- A9)                                                                                                                                            |       |
| النص                                                                                               | الكود | النص                                                                                                                                                    | الكود |
| استقراء أهداف القوى الاستعمارية وأن الوطن مستهدف.                                                  | LO 1  | تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج  | A 2   |
| إدراك أن التاريخ هو المعلم الأول للحكمة ولا بد من دراسته.                                          | LO 2  |                                                                                                                                                         |       |
| معرفة إيجابيات وسلبيات التجارب التي مرت بها مصر.                                                   | LO 3  |                                                                                                                                                         |       |
| تعريف دور الشعب في الكفاح الوطني، والإشادة بالحركة الوطنية ودورها في التصدي للاستعمار وظلم الحكام. | LO 4  | تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج. | A 3   |
| التمييز بين الحكام الإيجابيين والسلبيين وتقييم دور كل منهم.                                        | LO 5  |                                                                                                                                                         |       |
| الاستفادة مما اكتسبه من مهارات في حياته العملية.                                                   | LO 6  | استخدام التفكير الإبداعي والمبتكر والمرن واكتساب مهارات ريادة الأعمال والقيادة وتوقع المواقف الجديدة والاستجابة لها.                                    | A 9   |
| الموضوعية في الحكم على الأحداث في ضوء الظروف التي أحاطت بها.                                       | LO 7  |                                                                                                                                                         |       |
| القدرة على التحليل والاستنتاج.                                                                     | LO 8  |                                                                                                                                                         |       |
| القدرة على التوقع وتوظيف مهاراته في الحياة العملية.                                                | LO 9  |                                                                                                                                                         |       |
| توخي السلوك الطيب والاقتداء بالقوة الحسنة.                                                         | LO10  |                                                                                                                                                         |       |

#### 4- طرق التعليم والتعلم للمقرر:

| التدريس المباشر |                        | التدريس الغير مباشر |                                      |                         |             |                          |                  |                  |                    |               |                  | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |                   |                             |
|-----------------|------------------------|---------------------|--------------------------------------|-------------------------|-------------|--------------------------|------------------|------------------|--------------------|---------------|------------------|------------------------------------------------|--------------------|-------------------|-----------------------------|
| المحاضرات       | التعلم العملي والتجارب | العصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير / الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم بالإكتشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | التعلم الإلكتروني | النقاء الإصطناعي في التعليم |
| ✓               |                        | ✓                   |                                      | ✓                       | ✓           | ✓                        | ✓                |                  |                    | ✓             | ✓                |                                                |                    | ✓                 | ✓                           |

## الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي          | المحتوى العلمي للمقرر<br>(موضوعات المقرر) | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |       |
|------------------------------------|-------------------------------------------|------------------------------------|---------------------------|-------|
|                                    |                                           |                                    | تدريس<br>نظري             | تدريب |
|                                    |                                           |                                    |                           |       |
| عملية                              | تمارين                                    |                                    |                           |       |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| مراجعة وامتحان منتصف الفصل الدراسي |                                           |                                    |                           |       |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| 0                                  | 0                                         | 2                                  | 2                         | 0     |
| اختبارات الفصل الدراسي النهائية    |                                           |                                    |                           |       |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *                                 | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|-----------------------------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة)                   | 5                                                 | 10            | 10%                                     |
| 2 | امتحان 2 تحريري (أعمال سنة)                   | 9                                                 | 10            | 10%                                     |
| 3 | امتحان منتصف الفصل الدراسي                    | 7                                                 | 20            | 20%                                     |
| 4 | امتحان نهائي تحريري                           | 14                                                | 40            | 40%                                     |
| 5 | امتحان نهائي عملي                             | لا يوجد                                           | ----          | -----                                   |
| 6 | امتحان نهائي شفهي                             | 11                                                | 10            | 10%                                     |
| 7 | تكاليفات / مشروع / ملف الإنجاز / كتيب الأنشطة | 8                                                 | 10            | 10%                                     |

## 6- مصادر التعلم والتسهيلات المادية:

|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| المرجع الأساسي للمقرر                          | خالد الشرييني ، مرفت ذكي: تاريخ مصر الحديث، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان                                                                                                                                                                                                                                                                                                                            |
| المراجع الأخرى                                 | <p>1- إسماعيل مرسى: تاريخ مصر الحديث من الحملة الفرنسية حتى خلع فاروق، دار الكتب المصرية، 2020</p> <p>2- جاد طه: معالم تاريخ مصر الحديث والمعاصر، دار الفكر العربي، 1985.</p> <p>3- محمد عبد الرحيم مصطفى: تاريخ مصر الحديث.. المطبعة الأميرية.. 2019</p> <p>4- محمد سهيل طقوش: تاريخ مصر الحديث والمعاصر، دار النفائس، 2019.</p> <p>5- محمد صبري: تاريخ مصر الحديث من محمد علي إلى اليوم، دار الكتب المصرية، 2008</p> |
| المصادر الإلكترونية (لابد من إضافة الروابط)    | <p>1- <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a></p> <p>2- <a href="http://www.du.edu.eg/">http://www.du.edu.eg/</a></p> <p>3- <a href="https://www.youtube.com/">https://www.youtube.com/</a></p>                                                                                                                                                                                      |
| المنصة التعليمية (لابد من إضافة الرابط)        | <a href="https://www.ekb.eg/ar/home">https://www.ekb.eg/ar/home</a>                                                                                                                                                                                                                                                                                                                                                    |
| الأجهزة                                        | (داتا شو) وجهاز كمبيوتر محمول.                                                                                                                                                                                                                                                                                                                                                                                         |
| المستلزمات                                     | قاعة محاضرات مجهزة                                                                                                                                                                                                                                                                                                                                                                                                     |
| البرامج الإلكترونية                            | -----                                                                                                                                                                                                                                                                                                                                                                                                                  |
| معامل المهارات/ المحاكيات                      | -----                                                                                                                                                                                                                                                                                                                                                                                                                  |
| المعامل الافتراضية                             | -----                                                                                                                                                                                                                                                                                                                                                                                                                  |
| أخرى (تذكر)                                    | -----                                                                                                                                                                                                                                                                                                                                                                                                                  |
| مصادر التعلم (الكتب والمراجع العلمية وغيرها) * |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| التجهيزات التعليمية المساندة للتعليم والتعلم * |                                                                                                                                                                                                                                                                                                                                                                                                                        |

| منسق المقرر       | منسق البرنامج        |         |
|-------------------|----------------------|---------|
| أ.م.د. وليد رضوان | أ.د. أحمد عبد الغفار | الإسم   |
| وليد رضوان        | أحمد عبد الغفار      | التوقيع |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Numerical Method</b>                   |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MTH 103</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  | <b>2</b>         |                        | <b>4</b>     |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Safinaz Ahmed                         |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Solutions of nonlinear equations in one Variable(The Bisection Algorithm, Fixed point Iteration - The Newton- Raphson Method- Secant method- Error Analysis for Iterative Methods - Interpolation and polynomial Approximation (The Taylor Polynomials, Lagrange Polynomials) - Divided Differences-curve fitting - Numerical Differentiation - Numerical Integration( Romberg Integration, trapezoidal rule, Simpson rule) - Initial value problems for Ordinary Differential Equations(Elementary Theory of Initial Value problems, Euler's Method) - Improved Euler method, Rung-Kutta method- Numerical solutions of partial differential equation

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

| Program Outcomes (NARS/ARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                    | Course Learning Outcomes                                    |                                                                                                                    |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| A1, A5, A10                                                                   |                                                                                                                                                                                                                                                                                                                    | Upon completion of the course, the student will be able to: |                                                                                                                    |
| Code                                                                          | Text                                                                                                                                                                                                                                                                                                               | Code                                                        | Text                                                                                                               |
| <b>A1</b>                                                                     | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development | <b>LO1</b>                                                  | Define Mathematical Preliminaries.                                                                                 |
|                                                                               |                                                                                                                                                                                                                                                                                                                    | <b>LO2</b>                                                  | Describe the nonlinear equation in one variable.                                                                   |
|                                                                               |                                                                                                                                                                                                                                                                                                                    | <b>LO3</b>                                                  | Apply the definition of interpolation data points to solve problems.                                               |
|                                                                               |                                                                                                                                                                                                                                                                                                                    | <b>LO4</b>                                                  | Explain the curve fitting                                                                                          |
| <b>A5</b>                                                                     | Practice research techniques and methods of investigation as an inherent part of learning                                                                                                                                                                                                                          | <b>LO5</b>                                                  | Calculate mathematical results using numerical integration and differentiation methods.                            |
|                                                                               |                                                                                                                                                                                                                                                                                                                    | <b>LO6</b>                                                  | Justify the initial value problems for ordinary and partial differential equations                                 |
| <b>A10</b>                                                                    | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.                                                                                                                                                                                                                        | <b>LO7</b>                                                  | Solve problems of ordinary and partial differential equations                                                      |
|                                                                               |                                                                                                                                                                                                                                                                                                                    | <b>LO8</b>                                                  | Interpret graphically the initial value problems for ordinary and partial differential equations.                  |
|                                                                               |                                                                                                                                                                                                                                                                                                                    | <b>LO9</b>                                                  | Model various mathematical problems numerically, including interpolation, integration, and differential equations. |
|                                                                               |                                                                                                                                                                                                                                                                                                                    | <b>LO10</b>                                                 | Work under stress as leader of teamwork.                                                                           |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        | √          |                       | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                               | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                   |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                   |                    |                                       | Tutorial | Lab / Practical |
| 1        | Mathematical Preliminaries<br>(Review of calculus, Round off Errors and computer Arithmetic)                      | 4                  | 2                                     | 2        | 0               |
| 2        | Taylor series                                                                                                     | 4                  | 2                                     | 2        | 0               |
| 3        | Solutions of nonlinear equations in one Variable (The Bisection Algorithm)                                        | 4                  | 2                                     | 2        | 0               |
| 4        | The Newton- Raphson Method, False method.                                                                         | 4                  | 2                                     | 2        | 0               |
| 5        | Interpolation and polynomial Approximation (The Newton forward, Lagrange Polynomials, Newton Divided Differences) | 4                  | 2                                     | 2        | 0               |
| 6        | Fitting Curve (Straight line, Exponential function)                                                               | 4                  | 2                                     | 2        | 0               |
| 7        | Revision and Mid Exam                                                                                             |                    |                                       |          |                 |

|       |                                                               |   |   |   |   |
|-------|---------------------------------------------------------------|---|---|---|---|
| 8     | Fitting the rational function, and spiel function             | 4 | 2 | 2 | 0 |
| 9     | Numerical Integration (trapezoidal rule, Simpson rule         | 4 | 2 | 2 | 0 |
| 10    | Numerical Differentiation.                                    | 4 | 2 | 2 | 0 |
| 11    | Initial value problems for Ordinary Differential Equations    | 4 | 2 | 2 | 0 |
| 12    | (Elementary Theory of Initial Value problems, Euler's Method) | 4 | 2 | 2 | 0 |
| 13    | Improved Euler method, Rung-Kutta method.                     | 4 | 2 | 2 | 0 |
| 14    | the initial value problems for partial differential equations | 4 | 2 | 2 | 0 |
| 15,16 | Final Exam.                                                   |   |   |   |   |

### 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 3                               | 10            | 10%                              |
| 2   | Exam 2 written (Semester work) | 12                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 7   | Assignments                    | 13,14                           | 20            | 20%                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ol style="list-style-type: none"> <li>1. Erwin Kreyszig, Advanced Engineering Mathematics, Tenth Edition, New York : Wiley, 2011.</li> <li>2. Steven C. Chapra, Raymond, P. Canal, Numerical Methods for Engineers, 4 Th, McGraw-Hill Education, New York, 2015.</li> <li>3. James F. Epperson, An Introduction to Numerical Methods for Engineers and Scientists, Thrid Hill Education, New York, 2021</li> <li>4. Mikki Jaramillo, Numerical Methods for Differential Equations</li> </ol> |
|                                                                  | <b>Electronic Sources</b>                                                                                           | <ul style="list-style-type: none"> <li>• <a href="https://math.fandom.com/wiki/Hypermathematics">https://math.fandom.com/wiki/Hypermathematics</a></li> <li>• <a href="https://github.com/AlexCharlton/hypermath">https://github.com/AlexCharlton/hypermath</a></li> </ul>                                                                                                                                                                                                                    |



|  |                                                    |                                                                                                                                                                                                                                                                                                                                                         |
|--|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | (Links must be added)                              | <ul style="list-style-type: none"> <li>• <a href="https://www.britannica.com/science/mathematics">https://www.britannica.com/science/mathematics</a></li> <li>• <a href="https://www.khanacademy.org/math">https://www.khanacademy.org/math</a></li> <li>• <a href="https://animated-mathematics.net/">https://animated-mathematics.net/</a></li> </ul> |
|  | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                  |

|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b>                                                          |
|------------------|---------------------------|-------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr. Safinaz Ahmed         | Prof. Ahmed Abd El-Gafar                                                            |
| <b>Signature</b> | <i>Safinaz</i>            |  |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |      |             |        |                                                                 |
|----------------------------|------|-------------|--------|-----------------------------------------------------------------|
| الحضارة العربية والإسلامية |      |             |        | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| <b>HUM 103</b>             |      |             |        | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |      |             |        | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| نظري                       | عملي | اخرى (تحدد) | إجمالي | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 2                          |      |             | 2      |                                                                 |
| اختياري                    |      |             |        | نوع المقرر:                                                     |
| <b>JUNIOR</b>              |      |             |        | المستوى الدراسي الذي قدم فيه المقرر:                            |
| العلوم الأساسية            |      |             |        | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |      |             |        | المعهد:                                                         |
| أ.م.د. وليد رضوان          |      |             |        | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |      |             |        | جهة مناقشة واعتماد تقرير المقرر:                                |
| <b>7/26/2025</b>           |      |             |        | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

أسس الحضارة الإسلامية (القرآن والسنة - الأمة العربية - اللغة - الإطار الجغرافي - الشعوب المفتوحة - التأثيرات الأجنبية) - النظام السياسي (الخلافة - الوزارة - الكتابة - الحجابة) - النظام الإداري ( الإدارات المحلية - دواوين الجند والخراج والرسائل والبريد.....الخ) - النظام المالي (موارد بيت المال - النفقات - السكة) - النظم العسكرية (الجيش: تكوينه وأسلحته وأساليبه - الأسطول) - التعليم والثقافة (العلوم الشرعية "علم الكلام والفقه...." - العلوم العقلية) - الفنون والآثار والعمارة - القضاء والتقاضي - المجتمع الإسلامي (عناصره وأجناسه - الطوائف الدينية والمذهبية - البناء الطبقي: الحكام والفقهاء والعلماء والتجار وأصحاب الحرف والصناعات....الخ).

## 3- نواتج التعلم للمقرر:

#### اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                                                                                           |       | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)                                                                                                                                                            |       |
|---------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على أن                                                             |       | (A2- A3- A7)                                                                                                                                                                                                                                                       |       |
| النص                                                                                                          | الكود | النص                                                                                                                                                                                                                                                               | الكود |
| يستنتج مدى التأثير والتأثر بالأحداث التي مرت بها الحضارة العربية والإسلامية و معرفة مصادر تلك الحقبة الهامة . | LO 1  | تطوير وإجراء التجارب العملية المناسبة أو المحاكاة، وتحليل وتفسير وتقييم النتائج، واستخدام التحليلات الإحصائية والحكم الهندسي الموضوعي لاستخلاص النتائج                                                                                                             | A 2   |
| يربط بين التأثير والتأثر بأحداث الحضارة العربية والإسلامية و بين إنجازات و إخفاقات كل حقبة.                   | LO 2  |                                                                                                                                                                                                                                                                    |       |
| يربط بين التأثير والتأثر بأحداث الحضارة العربية والإسلامية و بين إنجازات و إخفاقات كل حقبة.                   | LO 3  |                                                                                                                                                                                                                                                                    |       |
| يستخدم المنهج التاريخي لتناول الأحداث الهامة في الحضارة العربية والإسلامية و مصادر تلك الفترة.                | LO 4  |                                                                                                                                                                                                                                                                    |       |
| يشرح المعلومات والأحداث التي تتعلق بالحضارة العربية والإسلامية .                                              | LO 5  | تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة، تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب المتسقة مع النظام والظروف، وضمن مبادئ وسياق التصميم والتنمية المستدامين. | A 3   |
| يتعرف على أهم المؤثرات التي ساهمت في تكوين الحضارة العربية والإسلامية .                                       | LO 6  |                                                                                                                                                                                                                                                                    |       |
| يلخص مصادر ومكانة الحضارة العربية والإسلامية.                                                                 | LO 7  |                                                                                                                                                                                                                                                                    |       |
| تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق .                                | LO 8  | العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعددة الثقافات.                                                                                                                                                                                                    | A 7   |
| يظهر مهارات إدارة الوقت بكفاءة في مجال أى مهنة ترتبط بالحضارة العربية والإسلامية .                            | LO 9  |                                                                                                                                                                                                                                                                    |       |
| يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية في مجال الحضارة العربية والإسلامية .                     | LO10  |                                                                                                                                                                                                                                                                    |       |

#### 4- طرق التعليم والتعلم للمقرر:

| التدريس المباشر |                         | التدريس الغير مباشر |                                      |                         |             |                          |                  |                  |                    |               |                  | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |                   |                             |
|-----------------|-------------------------|---------------------|--------------------------------------|-------------------------|-------------|--------------------------|------------------|------------------|--------------------|---------------|------------------|------------------------------------------------|--------------------|-------------------|-----------------------------|
| المحاضرات       | التعلم العملية والتجارب | العصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير / الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم بالإكتشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | التعلم الإلكتروني | النقاء الإصطناعي في التعليم |
| √               |                         | √                   |                                      | √                       | √           | √                        | √                |                  |                    | √             | √                |                                                |                    | √                 | √                           |

## الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي          | المحتوى العلمي للمقرر<br>(موضوعات المقرر) | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |                                                                                                                           |
|------------------------------------|-------------------------------------------|------------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------|
|                                    |                                           |                                    | تدريس<br>نظري             | تدريب                                                                                                                     |
|                                    |                                           |                                    |                           |                                                                                                                           |
| عملي                               | تمارين                                    |                                    |                           |                                                                                                                           |
| 0                                  | 0                                         | 2                                  | 2                         | تعريف بالمقرر الدراسي ومقدمة عامة                                                                                         |
| 0                                  | 0                                         | 2                                  | 2                         | أسس الحضارة الإسلامية : (القرآن والسنة – الأمة العربية – اللغة – الإطار الجغرافي – الشعوب المفتوحة – التأثيرات الأجنبية). |
| 0                                  | 0                                         | 2                                  | 2                         | النظام السياسي : (الخلافة – الوزارة – الكتابة – الحجابة).                                                                 |
| 0                                  | 0                                         | 2                                  | 2                         | النظام الإداري : (الإدارات المحلية – دواوين الجند والخراج والرسائل والبريد ..... إلخ).                                    |
| 0                                  | 0                                         | 2                                  | 2                         | النظام المالي : (موارد بيت المال – النفقات – السكة)                                                                       |
| 0                                  | 0                                         | 2                                  | 2                         | النظم العسكرية : (الجيش والأسطول : تكوينه وأسلحته وأساليبه )                                                              |
| مراجعة وامتحان منتصف الفصل الدراسي |                                           |                                    |                           |                                                                                                                           |
| 0                                  | 0                                         | 2                                  | 2                         | التعليم والثقافة : ( العلوم الشرعية " علم الكلام والفقه" – العلوم العقلية )                                               |
| 0                                  | 0                                         | 2                                  | 2                         | الفنون والآثار والعمارة.                                                                                                  |
| 0                                  | 0                                         | 2                                  | 2                         | القضاء والتقاضى .                                                                                                         |
| 0                                  | 0                                         | 2                                  | 2                         | المجتمع الإسلامي : ( غلصره و أجناسه – الطوائف الدينية والمذهبية)                                                          |
| 0                                  | 0                                         | 2                                  | 2                         | المجتمع الإسلامي، البناء الطبقي : الحكم والفقهاء والعلماء)                                                                |
| 0                                  | 0                                         | 2                                  | 2                         | التجـر و أصحاب الحرف والصناعات..... إلخ                                                                                   |
| 0                                  | 0                                         | 2                                  | 2                         | مراجعة عامة                                                                                                               |
| اختبارات الفصل الدراسي النهائية    |                                           |                                    |                           |                                                                                                                           |
| 16-15                              |                                           |                                    |                           |                                                                                                                           |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *                               | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|---------------------------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة)                 | 5                                                 | 10            | 10%                                     |
| 2 | امتحان 2 تحريري (أعمال سنة)                 | 9                                                 | 10            | 10%                                     |
| 3 | امتحان منتصف الفصل الدراسي                  | 7                                                 | 20            | 20%                                     |
| 4 | امتحان نهائي تحريري                         | 14                                                | 40            | 40%                                     |
| 5 | امتحان نهائي عملي                           | لا يوجد                                           | ----          | -----                                   |
| 6 | امتحان نهائي شفهي                           | 11                                                | 10            | 10%                                     |
| 7 | تكليفات / مشروع / ملف الإنجاز /كتيب الأنشطة | 8                                                 | 10            | 10%                                     |
| 8 | تدريب ميداني                                | لا يوجد                                           | -----         | -----                                   |
| 9 | أخرى (تذكر)                                 | لا يوجد                                           | -----         | -----                                   |

## 6- مصادر التعلم والتسهيلات المادية:

|                                                                                                                                                                                                                                                                                                                                                                         |                                                |                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------|
| خالد الشرييني ، مرفت ذكي: تاريخ مصر الحديث، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان                                                                                                                                                                                                                                                                             | المرجع الأساسي للمقرر                          | مصادر التعلم<br>(الكتب والمراجع العلمية وغيرها)<br>* |
| 1- أحمد عبد الرازق، الحضارة الإسلامية في العصور الوسطى، القاهرة، 2004 .<br>2- غيداء عادل: دراسات في الحضارة العربية الإسلامية، المؤسسة العربية للدراسات ونشر، 2020.<br>3- سعيد عبد الفتاح عاشور وآخران: دراسات في تاريخ الحضار الإسلامية، دار المعرفة الجامعية، 2018.<br>4- شوقي أبو خليل: الحضارة العربية الإسلامية وموجز عن الحضارات السابقة، دار الفكر المعاصر، 2010 | المراجع الأخرى                                 |                                                      |
| 1- <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a><br>2- <a href="http://www.du.edu.eg/">http://www.du.edu.eg/</a><br>3- <a href="https://www.youtube.com/">https://www.youtube.com/</a>                                                                                                                                                      | المصادر الالكترونية<br>(لابد من إضافة الروابط) |                                                      |
| <a href="https://www.ekb.eg/ar/home">https://www.ekb.eg/ar/home</a>                                                                                                                                                                                                                                                                                                     | المنصة التعليمية<br>(لابد من إضافة الرابط)     |                                                      |
| (داتا شو) وجهاز كمبيوتر محمول.                                                                                                                                                                                                                                                                                                                                          | الأجهزة                                        | التجهيزات التعليمية<br>المساندة للتعليم والتعلم *    |
| قاعة محاضرات مجهزة                                                                                                                                                                                                                                                                                                                                                      | المستلزمات                                     |                                                      |
| -----                                                                                                                                                                                                                                                                                                                                                                   | البرامج الالكترونية                            |                                                      |
| -----                                                                                                                                                                                                                                                                                                                                                                   | معامل المهارات/ المحاكيات                      |                                                      |
| -----                                                                                                                                                                                                                                                                                                                                                                   | المعامل الافتراضية                             |                                                      |
| -----                                                                                                                                                                                                                                                                                                                                                                   | أخرى (تذكر)                                    |                                                      |

| منسق البرنامج                                                                       | منسق المقرر                                                                          |         |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|
| أ.د. أحمد عبد الغفار                                                                | أ.م.د. وليد رضوان                                                                    | الإسم   |
|  |  | التوقيع |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |             |      |      |                                                                 |
|----------------------------|-------------|------|------|-----------------------------------------------------------------|
| التراث الأدبي المصري       |             |      |      | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| HUM 106                    |             |      |      | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |             |      |      | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| إجمالي                     | أخرى (تحدد) | عملي | نظري | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 2                          |             |      | 2    |                                                                 |
| اختياري                    |             |      |      | نوع المقرر:                                                     |
| JUNIOR                     |             |      |      | المستوى الدراسي الذي قدم فيه المقرر:                            |
| العلوم الأساسية            |             |      |      | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |             |      |      | المعهد:                                                         |
|                            |             |      |      | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |             |      |      | جهة مناقشة واعتماد تقرير المقرر:                                |
| 7/26/2025                  |             |      |      | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

يهدف المقرر إلى تعريف الطالب بالتميز الإقليمي لمصر في العصور القديمة والوسطى والحديثة وأثر عبقرية المكان على الفكر والوعي المصري وتجلياته في التراث الأدبي شعراً ونثراً من خلال الدرس التاريخي والنصي للأدب المصري في مراحل مختلفة كما يحتوي المقرر على التطورات الأدبية من منظور حضاري وإبداعي - المكتبة التراثية المصرية من منظور تاريخي متجدد - دراسة مفهوم وضعية العصور الوسطى في مصر والفرق بينها وبين العصور الوسطى في أوروبا - التراث الجغرافي المصري وأدب الرحلات في الكتابات المصرية - التأليف الموسوعي في مصر والصياغة الأدبية في فن الموسوعات - الظواهر الأدبية الغالبة على الأدب المصري - مناهج دراسة التراث الأدبي المصري ودلالاته - مدارس التأليف والإبداع في تاريخ الفكر المصري - مجالات الإبداع في الشعر المصري (الطبيعة المصرية - أدب الحروب - الموضوعات الجديدة والبيئة المصرية) - مدارس الكتابة الفنية على المستوى الرسمي وغيرها - تتبع التطبيق على النص والتحليل من خلال أبرز شعراء وكتاب التراث المصري من أمثال ابن نبتة المصري وابن سناء الملك وصولاً إلى أدوار الدكتور محمد كامل حسين والأستاذ أمين الخولي والدكتور جمال حمدان في تناول التراث الأدبي المصري بالتحليل والدراسة المنهجية حول عبقرية المكان.

## 3- نواتج التعلم للمقرر:

#### اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                                                                                                                       |       | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)                                                                                                                                                                  |       |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على                                                                                            |       | A3,A4, A5, A6,A10                                                                                                                                                                                                                                                        |       |
| النص                                                                                                                                      | الكود | النص                                                                                                                                                                                                                                                                     | الكود |
| يتعرف على أهمية دراسة التراث الأدبي المصري..                                                                                              | LO1   | تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياق التصميم والتنمية التطوير المستدامين. | A3    |
| يتعرف على أهم المؤثرات التي ساهمت في تكوين التراث الحضارى.                                                                                | LO2   |                                                                                                                                                                                                                                                                          |       |
| يلخص مصادر ومكانة التراث الحضارى و تأثيره في مقومات بقاء وإستمرار الأمم وفقاً لدورها الريادى والحضارى.                                    | LO3   | الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البنينة ومبادئ إدارة المخاطر.                                                                                                                                    | A4    |
| يستنتج الدور الحيوى والرئيسى للتراث الادبى المصرى..                                                                                       | LO4   |                                                                                                                                                                                                                                                                          |       |
| يربط بين التأثير والتأثر بين الحضارات القديمة والحديثة.                                                                                   | LO5   |                                                                                                                                                                                                                                                                          |       |
| يقارن بين الحضارة العربية الاسلامية والحضارات الحديثة و يربط بين محتوات المنهج والأحداث التي يمر بها عالمنا العربى الإسلامى .             | LO6   |                                                                                                                                                                                                                                                                          |       |
| يثمن قيمة العلم والمعرفة و يثمن دور العقول العربية الاسلامية التي أبدعت في كافة الميادين.                                                 | LO7   |                                                                                                                                                                                                                                                                          |       |
| يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية في مجال التراث الحضارى.                                                              | LO8   | ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.                                                                                                                                                                                                             | A5    |
| يظهر مهارات إدارة الوقت بكفاءة في مجال أى مهنة ترتبط بالتراث الحضارى.                                                                     | LO9   | التخطيط والإشراف والرقابة علي تنفيذ المشاريع الهندسية مع مراعاة متطلبات الحرف الأخرى                                                                                                                                                                                     | A6    |
| تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق يظهر مهارات التواصل مع الآخرين، و كذلك قدرات التعلم الذاتى . | LO10  | اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتى وغيرها مدى الحياة.                                                                                                                                                                                    | A10   |

#### 4 طرق التعليم والتعلم للمقرر:

| التدريس المباشر |                           | التدريس الغير مباشر |                                      |                         |             |                          |                  |                  |                    |               |                  | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |                   |                             |
|-----------------|---------------------------|---------------------|--------------------------------------|-------------------------|-------------|--------------------------|------------------|------------------|--------------------|---------------|------------------|------------------------------------------------|--------------------|-------------------|-----------------------------|
| المحاضرات       | التمارين العملية والتجارب | العصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير / الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم بالإكتشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | التعلم الإلكتروني | النقاء الإصطناعي في التعليم |
| √               |                           | √                   |                                      |                         |             | √                        | √                |                  |                    | √             |                  |                                                |                    | √                 |                             |

### الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي | المحتوى العلمي للمقرر<br>(موضوعات المقرر)                                 | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |       |
|---------------------------|---------------------------------------------------------------------------|------------------------------------|---------------------------|-------|
|                           |                                                                           |                                    | تدريس<br>نظري             | تدريب |
|                           |                                                                           |                                    |                           | عملي  |
| 1                         | تعريف بالمقرر الدراسي ومقدمة عامه                                         | 2                                  | 2                         | 0     |
| 2                         | زعم المتعصبين أن كل الإنجازات العلمية من<br>إبداعات الحضارة الغربية.      | 2                                  | 2                         | 0     |
| 3                         | الأرقام من إبداعات العلماء العرب<br>و المسلمين                            | 2                                  | 2                         | 0     |
| 4                         | قيام الحضارات على العلم والدين                                            | 2                                  | 2                         | 0     |
| 5                         | الحضارة الفرعونية بين الإبداع<br>و التشكيك.                               | 2                                  | 2                         | 0     |
| 6                         | التراث الحضارى ذاكرة الامم .                                              | 2                                  | 2                         | 0     |
| 7                         | مراجعة وامتحان منتصف الفصل الدراسي                                        |                                    |                           |       |
| 8                         | العلم تراث حضارى مشترك .                                                  | 2                                  | 2                         | 0     |
| 9                         | لماذا شيد قدماء المصريين أكبر الاهرامات على<br>هضبة صخرية صلبة            | 2                                  | 2                         | 0     |
| 10                        | الأتدلس الباب الغربى الذى إنتقلت عبره علوم<br>العرب والمسلمين الى اوروبا. | 2                                  | 2                         | 0     |
| 11                        | أهمية دراسة التراث الحضارى                                                | 2                                  | 2                         | 0     |
| 12                        | أهمية دراسة المقررات الثقافية                                             | 2                                  | 2                         | 0     |
| 13                        | مراجعة عامه                                                               | 2                                  | 2                         | 0     |
| 14                        | إختبارات الفصل الدراسي النهائية                                           |                                    |                           |       |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *               | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|-----------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة) | 5                                                 | 10            | 10 %                                    |
| 2 | امتحان 2 تحريري (أعمال سنة) | 12                                                | 10            | 10 %                                    |
| 3 | امتحان منتصف الفصل الدراسي  | 7                                                 | 20            | 20 %                                    |
| 4 | امتحان نهائي تحريري         | 14                                                | 40            | 40 %                                    |
| 5 | تكاليفات / تقارير           | طوال الفصل                                        | 20            | 20 %                                    |

## 6- مصادر التعلم والتسهيلات المادية:

|                       |                                               |
|-----------------------|-----------------------------------------------|
| المرجع الأساسي للمقرر | كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل |
|-----------------------|-----------------------------------------------|



|                                                                                                                                                                                                                                                                                                 |                                                              |                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------|
| <p>1- عوض مرسى الغلري، دراست في الألب المصري، الدار الدولية للاستثمارات الثقافية، القاهرة الطبعة الأولى، 2017</p> <p>2- أحمد عبد الرازق، الحضارة الإسلامية في العصور الوسطى، القاهرة، 2020 .</p> <p>3- عبد الرحمن بدوي: دور العرب في تكوين الفكر الاوربي. الهيئة المصرية العامة للكتاب 2021</p> | <p>(لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)</p> |                                                           |
|                                                                                                                                                                                                                                                                                                 | <p>المراجع الأخرى</p>                                        | <p>مصادر التعلم (الكتب والمراجع العلمية وغيرها)<br/>*</p> |
| <p><a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a><br/><a href="http://www.du.edu.eg/">http://www.du.edu.eg/</a><br/><a href="https://www.youtube.com/watch?=bnCua19ME">https://www.youtube.com/watch?=bnCua19ME</a></p>                                              | <p>المصادر الالكترونية (لابد من إضافة الروابط)</p>           |                                                           |
| <p>EKB - Microsoft office</p>                                                                                                                                                                                                                                                                   | <p>المنصة التعليمية (لابد من إضافة الرابط)</p>               |                                                           |
| <p>قاعة محاضرات مجهزة</p>                                                                                                                                                                                                                                                                       | <p>الأجهزة</p>                                               |                                                           |
| <p>Data show, White board</p>                                                                                                                                                                                                                                                                   | <p>المستلزمات</p>                                            |                                                           |
| <p>Microsoft Teams</p>                                                                                                                                                                                                                                                                          | <p>البرامج الالكترونية</p>                                   |                                                           |
| <p>-----</p>                                                                                                                                                                                                                                                                                    | <p>معامل المهارات/ المحاكيات</p>                             |                                                           |
| <p>-----</p>                                                                                                                                                                                                                                                                                    | <p>المعامل الافتراضية</p>                                    |                                                           |
| <p>-----</p>                                                                                                                                                                                                                                                                                    | <p>أخرى (تذكر)</p>                                           | <p>التجهيزات التعليمية المساندة للتعليم والتعلم *</p>     |

| منسق البرنامج                                                                       | منسق المقرر |         |
|-------------------------------------------------------------------------------------|-------------|---------|
| أ.د. أحمد عبدالغفار                                                                 |             | الإسم   |
|  |             | التوقيع |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                                |                 |                        |              |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Communication &amp; Presentation Skills</b> |                 |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>HUM 108</b>                                 |                 |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>BASIC SCIENCES</b>                          |                 |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                             | <b>Tutorial</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <u>1</u>                                       | <u>2</u>        |                        | <u>3</u>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                     |                 |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                                  |                 |                        |              |
| <b>Academic Program:</b>                                                                                        | <u><b>ALL ENGINEERING PROGRAMS</b></u>         |                 |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>          |                 |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | DR. Ashraf selim                               |                 |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department      |                 |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                               |                 |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Course Aims to provide the student with the latest knowledge about the concepts, characteristics, and types of managerial and interpersonal communications, as well as the concepts and requirement of good listening and presentation, and Developing the student's abilities and skills of effective communication, and good listening, as well as how to use the interpersonal and managerial communication methods and the presentation techniques in performance and dealing

with others inside and outside the organization. Course Contents: Concept and nature of communication – Communication model – Formal and informal communications - Interpersonal and managerial communications – Body language – Written communications (Reports and memos) – Ten Communications of effective communication – Good listening – Elements of effective presentation model –Preparation of good presentation – Carrying out presentations – Discussion and dealing with.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                              | <b>Course Learning Outcomes</b>                                    |                                                                                             |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>(A8, A9, A10)</b>                                                             |                                                                                                                                              | <b>Upon completion of the course, the student will be able to:</b> |                                                                                             |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                  | <b>Code</b>                                                        | <b>Text</b>                                                                                 |
| <b>A8</b>                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                         | <b>LO1</b>                                                         | formulate e interpersonal Communication                                                     |
|                                                                                  |                                                                                                                                              | <b>LO2</b>                                                         | embody languages communication                                                              |
|                                                                                  |                                                                                                                                              | <b>LO3</b>                                                         | Learn types of managerial and interpersonal communications                                  |
|                                                                                  |                                                                                                                                              | <b>LO4</b>                                                         | Identify the main items of the of Communication technology                                  |
| <b>A9</b>                                                                        | Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations | <b>LO5</b>                                                         | Define the main items of the of of Presentation Skills                                      |
|                                                                                  |                                                                                                                                              | <b>LO6</b>                                                         | presentation techniques in performance and dealing with others inside organization          |
| <b>A10</b>                                                                       | Acquire and apply new knowledge and practice self, lifelong and other learning strategies.                                                   | <b>LO7</b>                                                         | presentation techniques in performance and dealing with others and outside the organization |
|                                                                                  |                                                                                                                                              |                                                                    |                                                                                             |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        |            |                       | √                  | √          |                |            |               |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                             | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|---------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                 |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                 |                    |                                       | Tutorial | Practical Lab / |
| 1        | Fundamental of definition concepts, characteristics and types of Communication. | 3                  | 1                                     | 2        | 0               |
| 2        | managerial and interpersonal communications                                     | 3                  | 1                                     | 2        | 0               |
| 3        | concepts and requirement of good communications                                 | 3                  | 1                                     | 2        | 0               |
| 4        | Communication model – Formal and informal communications                        | 3                  | 1                                     | 2        | 0               |
| 5        | Interpersonal and managerial communications                                     | 3                  | 1                                     | 2        | 0               |
| 6        | how to use the interpersonal and managerial communication methods               | 3                  | 1                                     | 2        | 0               |

|       |                                                                                             |   |   |   |   |
|-------|---------------------------------------------------------------------------------------------|---|---|---|---|
| 7     | <b>Revision and Mid Exam</b>                                                                |   |   |   |   |
| 8     | Elements of effective presentation                                                          | 3 | 1 | 2 | 0 |
| 9     | presentation techniques                                                                     | 3 | 1 | 2 | 0 |
| 10    | presentation techniques in performance and dealing with others inside organization          | 3 | 1 | 2 | 0 |
| 11    | presentation techniques in performance and dealing with others and outside the organization | 3 | 1 | 2 | 0 |
| 12    | Interpersonal communications                                                                | 3 | 1 | 2 | 0 |
| 13    | Body language skills                                                                        | 3 | 1 | 2 | 0 |
| 14    | Elements of effective presentation technique                                                | 3 | 1 | 2 | 0 |
| 15,16 | <b>Final Exam.</b>                                                                          |   |   |   |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 4                               | 10            | 10                               |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10                               |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | presentation skills            | 9,10                            | 10            | 10                               |
| 6   | Assignments                    | 11                              | 10            | 10                               |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                     |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | HTI; Available Hard copy .<br><br><b>Available Presentation (handed to students' part by part)</b>                                  |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>-Gary Johns and Alan M.Saks, Organization Behavior, Addison Wesley Longman, 2009.</li> </ul> |

|  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | <ul style="list-style-type: none"> <li>• -Scgermerhorn Jr., R. J., and Osborn, N. R., <b>Organizational Behavior</b>, John Wiley &amp; Sons, Inc., New York, 10th Ed.,2008”.</li> <li>• Lustberg, Arch: <b>How To Sell Yourself: Winning Techniques For Selling Yourself, Your Ideas, Your Message</b>. Franklin Lakes: The Career Press, 2002</li> <li>• Bovee, Courtland L, John V. Thill &amp; Barbara E. Schatzman. <b>Business Communication Today: Tenth Edition</b>. New Jersey: Prentice Hall, 2010</li> <li>• Hasson, Gill. <b>Brilliant Communication Skills</b>. Great Britain: Pearson Education, 2012.</li> <li>• Ajmani, J. C. <b>Good English: Getting it Right</b>. New Delhi: Rupa Publications, 2012.</li> <li>• Bovee, Courtland L, John V. Thill &amp; Barbara E. Schatzman. <b>Business Communication Today: Tenth Edition</b>. New Jersey: Prentice Hall, 2010.</li> <li>• Lesikar, Raymond V and Marie E. Flatley. <b>Basic Business Communication: Skills for Empowering the Internet Generation: Ninth Edition</b>. New Delhi: Tata McGraw-Hill, 2002.</li> <li>• -Henderson, Fiona, &amp; Parkes, Geoff. (2023). "Improving Presentation Skills in Higher Education: A Case Study." <i>Journal of Further and Higher Education</i>, 47(2), 184-196</li> <li>• -Graveline, Denise. (2023). "The Science of Effective Communication." <i>Harvard Business Review</i>, 101(3), 80-87.”.</li> <li>• Gallo, Carmine. (2022). <b>Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Minds</b>. St. Martin's Griffin</li> <li>• Henderson, Fiona, &amp; Parkes, Geoff. (2022). "Improving Presentation Skills in Higher Education: A Case Study." <i>Journal of Further and Higher Education</i>, 45(4), 510-523.</li> <li>• Graveline, Denise. (2022). "The Science of Effective Communication." <i>Harvard Business Review</i>, 99(5), 92-99.</li> <li>• Lesikar, Raymond V and Marie E. Flatley. <b>Basic Business Communication: Skills for Empowering the Internet Generation: Ninth Edition</b>. New Delhi: Tata McGraw-Hill, 2022.</li> <li>• Gary Johns and Alan M.Saks, <b>Organization Behavior</b>, Addison Wesley Longman, 2009</li> <li>• Ajmani, J. C. <b>Good English: Getting it Right</b>. New Delhi: Rupa Publications, 2012.</li> </ul> |
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|--------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <ul style="list-style-type: none"> <li>• Gallo, Carmine. (2022). Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Mind</li> <li>• The Power of Saying No: The New Science of How to Say No That Puts You in Charge of Your Life" by Vanessa Patrick (2023)</li> <li>• "Speaking with Strategic Impact: Reach, Connect, and Lead" by Kate Leavell (2023)</li> <li>• "The New Rules of Marketing and PR: How to Use Content Marketing, Podcasting, Social Media, AI, Live Video, and Newsjacking to Reach Buyers Directly" by David Meerman Scott (8th Edition, 2024)</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://cadreworks.org/resources/communication-skills">https://cadreworks.org/resources/communication-skills</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | <b>Notebook and data show</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                          | <b>Supplies</b>                                    | <b>data show equipped lecture room</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                          | <b>Electronic Programs</b>                         | <b>Microsoft power point</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                            |
|------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>DR.Ashraf selim</b>                                                              | <b>PROF. Ahmed Abd El-Gafar</b>                                                       |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Surveying (2)</b>                      |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 141</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | <b>Compulsory</b>                         |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Dr. Amr Nada</b>                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Theodolite: temporary setting up, measuring of horizontal and vertical angles, permanent adjustment of theodolite, errors in measuring horizontal and vertical angles. Indirect Methods for Distance Measurement: stadia Method, tangent Methods, substance bar. Setting out of Horizontal and Vertical Curves.



### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes Pos (NARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | Course Learning Outcomes                                    |                                                                                                                                                              |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (A1, A2, A6, and B1)                                                      |                                                                                                                                                                                                                                                                                                                                                                                                             | Upon completion of the course, the student will be able to: |                                                                                                                                                              |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                        | Code                                                        | Text                                                                                                                                                         |
| A1                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.                                                                                                                                                                                                                                                                            | LO1                                                         | Identify the using of theodolite, measuring horizontal and vertical angles.                                                                                  |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO2                                                         | Solve the equations of the indirect method of distance and difference of height measurements (tachometric).                                                  |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | LO3                                                         | Conduct appropriate experimentation for theodolite traversing computation and adjustment of the connected traverse.                                          |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | LO4                                                         | Apply the design processes of setting out the different types of curves and curve geometry (Horizontal and vertical curves).                                 |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO5                                                         | Select appropriate type of traverse; open traverse or connected traverse, and the appropriate type of horizontal curves; simple, compound and reverse curve. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      |            | √                     | √                  | √          |                | √          | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                            | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                |                    |                                       | Tutorial | Practical / Lab |
| 1        | Theodolite: Parts of theodolite, Temporary and permanent adjustment.                                           | 3                  | 2                                     | 0        | 1               |
| 2        | Horizontal Angle measurements; single method.                                                                  | 3                  | 2                                     | 0        | 1               |
| 3        | Horizontal Angle measurements; repetition method.<br><a href="#">Orientation to Modern Surveying Equipment</a> | 3                  | 2                                     | 0        | 1               |
| 4        | Horizontal Angle measurements; direction method.<br><a href="#">Total Station Basics and Field Practice</a>    | 3                  | 2                                     | 0        | 1               |
| 5        | Vertical Angle Measurements.                                                                                   | 3                  | 2                                     | 0        | 1               |
| 6        | Tachometric Surveying, Principle and definition.                                                               | 3                  | 2                                     | 0        | 1               |

|       |                                                                                                    |   |   |   |   |
|-------|----------------------------------------------------------------------------------------------------|---|---|---|---|
|       | Introduction to GPS-Based Surveying                                                                |   |   |   |   |
| 7     | <b>Revision and Mid Exam</b>                                                                       |   |   |   |   |
| 8     | Tachometric Surveying, Principle and definition; stadia method. Fundamentals of LiDAR Technology   | 3 | 2 | 0 | 1 |
| 9     | Tangential Method.                                                                                 | 3 | 2 | 0 | 1 |
| 10    | Traversing: Omitted observation. Integrated Field Applications Using Modern Surveying Technologies | 3 | 2 | 0 | 1 |
| 11    | Adjustment of connected traverse.                                                                  | 3 | 2 | 0 | 1 |
| 12    | Types of curves and curve geometry. Horizontal curve and method for setting out.                   | 3 | 2 | 0 | 1 |
| 13    | Vertical curve and method or setting out.                                                          | 3 | 2 | 0 | 1 |
| 14    | Final Practical exam.                                                                              | 3 | 2 | 0 | 1 |
| 15,16 | <b>Final Exam.</b>                                                                                 |   |   |   |   |

### **Experiment Topics: (If any)**

| Serial | Experiment                  |
|--------|-----------------------------|
| 1      | Single method               |
| 2      | Repetition method           |
| 3      | Direction method            |
| 4      | Vertical Angle Measurements |
| 5      | Stadia method               |
| 6      | Tangential Method           |
| 7      | Traversing                  |

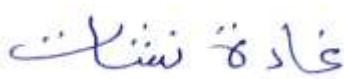
### **5- Methods of students' assessment:**

| No. | Assessment Methods * | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------|---------------------------------|---------------|----------------------------------|
|-----|----------------------|---------------------------------|---------------|----------------------------------|

|   |                                |        |    |      |
|---|--------------------------------|--------|----|------|
| 1 | Quiz 1 written (Semester work) | 4      | 5  | 5 %  |
| 2 | Quiz 2 written (Semester work) | 11     | 5  | 5 %  |
| 3 | Midterm exam                   | 7      | 30 | 30 % |
| 4 | Final Written Exam             | 15, 16 | 30 | 30 % |
| 5 | Final Practical Exam           | 14     | 10 | 10 % |
| 6 | Assignments / Project          | 1:13   | 5  | 5 %  |
| 7 | Practical (Term work)          | 1:13   | 15 | 15 % |

### 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | - Duggal, S.K., "Surveying", Volume 2, ISBN-10: 9353167523, MC Graw Hill India, 2018.                                                                                                                                                                                                                                                                                                                                            |
|                                                                          | <b>Other References</b>                                                                                             | - Bannister, A., Raymond, S. and Baker, R., "Surveying", 6 <sup>th</sup> Edition, ISBN 10: 0582302498, Prentice Hall, 1998.<br><br>- Dr. B. C. Punmia, Ashok, K. J., Arun, K. J.   Laxmi "Surveying Volume 2, 8 <sup>th</sup> Edition, National Institute of Technology Goa Farmagudi, Ponda, Goa – 403 401, 2018.<br><br>- A., M., Chandra, "Plane Surveying", New Age International Publishers, 2 <sup>nd</sup> Edition, 2007. |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://archive.org/details/surveying0000bann_i6o6">https://archive.org/details/surveying0000bann_i6o6</a>                                                                                                                                                                                                                                                                                                              |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB – Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Surveying laboratory: Theodolite                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                          | <b>Supplies</b>                                                                                                     | Data show                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                               |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | Dr. Amr Nada                                                                        | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Engineering Economics</b>              |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MNG 102</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Mechanical Engineering</b>             |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  | <b>1</b>         | <b>--</b>              | <b>3</b>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b>Mechanical Engineering</b>             |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Dr. Muhammad Tayssir</b>               |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | 8/12/2025                                 |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Introduction to Economy: Basic Concepts, Varieties of Market Structure, The Law of Supply and Demand, Elasticity, Different Types of Economy, Accounting Income and Cash Flow, The Objectives of the Firms, Balance Sheet (BS). Introduction To Engineering Economy: Engineering Decision Making, Break - Even Analysis, Production Function, Payback Period Method, Payback Period Method. Time Value of Money: Simple Interest Rate, Compound Interest, Discreet cash flow and Economic Equivalence, Evaluating of the Projects (Present Worth, Annual worth, and Capitalized Cost), Nominal and Effective Interest Rate. Rate - Of Return ROR Computations: Rate of Return calculations using A Present worth PW, Rate of Return Calculation by Using Annual worth EAW, Rate of Return Evaluation for Multiple Alternatives. Depreciation Models: Nature of Depreciation,

Depreciation Conventional Methods, Methods Based on Asset Usage, Switching Between Depreciation Models.

### **3. Course Learning Outcomes CLOs:**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                    | <b>Course Learning Outcomes</b>                                    |                                                                                                            |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>A1, A2</b>                                                                    |                                                                                                                                                                                                                    | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                            |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                        | <b>Code</b>                                                        | <b>Text</b>                                                                                                |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.                                                                                  | <b>LO1</b>                                                         | Identify concepts of cost and revenue in engineering economic decisions.                                   |
|                                                                                  |                                                                                                                                                                                                                    | <b>LO2</b>                                                         | Explain the concept and purpose of breakeven analysis in evaluating economic viability.                    |
|                                                                                  |                                                                                                                                                                                                                    | <b>LO3</b>                                                         | Classify cost elements as fixed or variable and justify the classification within project scenarios.       |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions. | <b>LO4</b>                                                         | Apply breakeven analysis techniques to assess company profitability in realistic business cases.           |
|                                                                                  |                                                                                                                                                                                                                    | <b>LO5</b>                                                         | Analyze project data to evaluate profitability and identify potential financial risks.                     |
|                                                                                  |                                                                                                                                                                                                                    | <b>LO6</b>                                                         | Apply nominal and effective interest rate formulas to solve engineering economic problems in case studies. |
|                                                                                  |                                                                                                                                                                                                                    | <b>LO7</b>                                                         | Design a proposed project by identifying its cost elements and assessing its economic feasibility.         |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | ✓                    |                        |            | ✓                     | ✓                  | ✓          |                |            |               |                    |                                          |              |            | ✓               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics) | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                     |                    |                                       | Tutorial | / Practical Lab |
| 1        | Introduction                                        | 3                  | 2                                     | 1        |                 |
| 2        | Description and Role in Decision Making             | 3                  | 2                                     | 1        |                 |
| 3        | Simple Interest                                     | 3                  | 2                                     | 1        |                 |
| 4        | Cost Concepts and Behavior                          | 3                  | 2                                     | 1        |                 |
| 5        | Cost Concepts and Behavior                          | 3                  | 2                                     | 1        |                 |
| 6        | Life-Cycle Product Costing and Pricing              | 3                  | 2                                     | 1        |                 |
| 7        | Revision and Mid Exam                               |                    |                                       |          |                 |
| 8        | Introduction to Use Spreadsheet                     | 3                  | 2                                     | 1        |                 |
| 9        | Factors: How Time and Interest Affect Money         | 3                  | 2                                     | 1        |                 |
| 10       | PW, FW, EUAS / EUAC                                 | 3                  | 2                                     | 1        |                 |
| 11       | Net present value, rate of interest                 | 3                  | 2                                     | 1        |                 |
| 12       | Payback period, benefit.                            | 3                  | 2                                     | 1        |                 |



|       |                                 |   |   |   |  |
|-------|---------------------------------|---|---|---|--|
| 13    | Choosing among alternatives     | 3 | 2 | 1 |  |
| 14    | Introduction to Use Spreadsheet | 3 | 2 | 1 |  |
| 15,16 | Final Exam.                     |   |   |   |  |

#### 5- Methods of students' assessment:

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work or quiz)    | 4                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work or quiz)    | 6                               | 10            | 10 %                             |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project /Portfolio/ Logbook | 10,12                           | 20            | 20 %                             |

#### 6- Learning Resources and Supportive Facilities \*

|                                                           |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning resources (books, scientific references, etc.) * | The main (essential) reference (must be written in full according to the scientific documentation method) | Engineering economy, le and blank, P.E Anthony, seventh edition,2018 build by Mc Grain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Other References                                                                                          | <ul style="list-style-type: none"> <li>• Engineering economy analysis, 9th edition, Donald G newman and Ted G., 2004 published by oxford university, press, Inc.</li> <li>• Jose A. Sepulveda, William E. Souder &amp; Byron S. Gottfried, "Engineering Economics" ,Mc-Graw-Hill Book Company, NW,1984.</li> <li>• H. G. Thuesen, W. J. Fabrycky &amp; G. J. Thuesen, "Engineering Economy", Prentice-Hall,Inc., NJ, 1971.</li> <li>• E. Paul DeGarmo, William G. Sullivan &amp; James A. Bontadelli, "Engineering Economy", Macmillan publishing company,Nw,1990.</li> </ul> |
|                                                           | Electronic Sources (Links must be added)                                                                  | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                           | Learning Platforms (Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                           | Devices/Instruments                                                                                       | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|                                                                          |                                |          |
|--------------------------------------------------------------------------|--------------------------------|----------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Supplies</b>                | N/A      |
|                                                                          | <b>Electronic Programs</b>     | MS-Teams |
|                                                                          | <b>Skill Labs/ Simulators</b>  | N/A      |
|                                                                          | <b>Virtual Labs</b>            | N/A      |
|                                                                          | <b>Other (to be mentioned)</b> | N/A      |

|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                          |
|------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr. Muhammad Tayssir                                                              | Dr. Mohamed Ashraf                                                                  |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>French Language</b>                    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>LNG 101</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  |                  |                        | <b>2</b>     |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Mai Abouzaid                          |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

An elementary French course. Drill in pronunciation, elementary principles of inflection and basic sentence patterns. Reading of easy texts. Review of grammatical patterns. Expansion of conversational and written skills and vocabulary.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                      | Course Learning Outcomes                                    |                                                                                      |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------|
| (A8, A10)                                                                 |                                                                                                                      | Upon completion of the course, the student will be able to: |                                                                                      |
| Code                                                                      | Text                                                                                                                 | Code                                                        | Text                                                                                 |
| A8                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools. | LO1                                                         | Have a mix of skills in French Language.                                             |
|                                                                           |                                                                                                                      | LO2                                                         | Study different grammatical Rules.                                                   |
|                                                                           |                                                                                                                      | LO3                                                         | Enhance students’ abilities in expressing themselves.                                |
|                                                                           |                                                                                                                      | LO4                                                         | Apply the principle of grammatical rules in their usage of French.                   |
|                                                                           |                                                                                                                      | LO5                                                         | Apply the four skills of language freely.                                            |
| A10                                                                       | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies..                         | LO6                                                         | Express themselves in French with confidence.                                        |
|                                                                           |                                                                                                                      | LO7                                                         | Upgrade the capability of usage of the French language in various topics.            |
|                                                                           |                                                                                                                      | LO8                                                         | Gain knowledge of general vocabulary that would help the students in various topics. |
|                                                                           |                                                                                                                      | LO9                                                         | Enhance the degree of awareness to participate professionally in their life.         |
|                                                                           |                                                                                                                      | LO10                                                        | Work effectively in team of multi-disciplinary or multi-culture.                     |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              | √          |                 |

## Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics) | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                     |                    |                                       | Tutorial | / Practical Lab |
| 1        | Lecon 1: La Meteo.                                  | 2                  | 2                                     | 0        | 0               |
| 2        | Lecon 2: Hier et avant heir.                        | 2                  | 2                                     | 0        | 0               |
| 3        | Lecon 3: Lettre d'une illettree                     | 2                  | 2                                     | 0        | 0               |
| 4        | Lecon 4: Le recit de vie                            | 2                  | 2                                     | 0        | 0               |
| 5        | Lecon 5: Comment ecrivez-vous?                      | 2                  | 2                                     | 0        | 0               |
| 6        | Lecon 6: Dis-moi la verite!                         | 2                  | 2                                     | 0        | 0               |
| 7        | Revision and Mid Exam                               |                    |                                       |          |                 |
| 8        | Lecon 7: Quelle bonne odeur!                        | 2                  | 2                                     | 0        | 0               |
| 9        | Lecon 8: Va plus vite.                              | 2                  | 2                                     | 0        | 0               |
| 10       | Supplementary Material and Quiz                     | 2                  | 2                                     | 0        | 0               |
| 11       | Presentations                                       | 2                  | 2                                     | 0        | 0               |
| 12       | Supplementary materials and Quiz                    | 2                  | 2                                     | 0        | 0               |
| 13       | Revision and Quiz                                   | 2                  | 2                                     | 0        | 0               |
| 14       | Final Exam.                                         |                    |                                       |          |                 |

## 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | QUIZ 1 written (Semester work) | 4                               | 10            | 10%                              |
| 2   | QUIZ 2 written (Semester work) | 11                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15                              | 40            | 40 %                             |
| 5   | Assignments (Report & Sheet)   | 10,12                           | 20            | 20%                              |

## 6- Learning Resources and Supportive Facilities \*

|                                                               |                                                                                                           |                                                                                                                                                                                                            |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning resources (books, scientific references, etc.) *     | The main (essential) reference (must be written in full according to the scientific documentation method) | Available Presentation (handed to students' part by part).                                                                                                                                                 |
|                                                               | Other References                                                                                          | 1-En Francais "; HTI; copie papier disponible.2021.<br>2-Presentation disponible (remis aux etudiants partie par partie).2022<br>3-Grammaire Francais en usage.2022<br>4-Vocabulaire Francais utilise.2022 |
|                                                               | Electronic Sources (Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://www.ecpi.edu/blog/what-is-business-administration-all-about">https://www.ecpi.edu/blog/what-is-business-administration-all-about</a></li> </ul>    |
|                                                               | Learning Platforms (Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                     |
| Supportive facilities & equipment for teaching and learning * | Devices/Instruments                                                                                       | Notebook and data show equipped lecture room.                                                                                                                                                              |
|                                                               | Supplies                                                                                                  | Teaching aids and computers.                                                                                                                                                                               |
|                                                               | Skill Labs/ Simulators                                                                                    |                                                                                                                                                                                                            |
|                                                               | Other (to be mentioned)                                                                                   | Notebook and data show equipped lecture room.                                                                                                                                                              |

|                  |                           |                                                                                       |
|------------------|---------------------------|---------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b>                                                            |
| <b>Name</b>      | Dr. Mai Abouzaid          | Prof. Ahmed Abd El-Gafar                                                              |
| <b>Signature</b> | <i>Mai Abouzaid</i>       |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>German Language</b>                    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>LNG 102</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  |                  |                        | <b>2</b>     |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Hoda Arafa                            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Beginner's course. Development of speaking ability and mastering of German basic structures. Reading and understanding of simple texts. Systematic discussion of grammatical difficulties. Oral practice and reading of more difficult texts. Practice in guided composition

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).**

| Program Outcomes (NARS/ARS)<br>(according to the matrix in the program specs) |                                                                                                                                                             | Course Learning Outcomes                                    |                                                                                                                               |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| ( A8, A9, A10)                                                                |                                                                                                                                                             | Upon completion of the course, the student will be able to: |                                                                                                                               |
| Code                                                                          | Text                                                                                                                                                        | Code                                                        | Text                                                                                                                          |
| A8                                                                            | Enhance and Develop the students' abilities and awareness for appropriate analysis and interpretation to all the scientific topics written in German words. | LO1                                                         | Have a mix of skills in German Language.                                                                                      |
|                                                                               |                                                                                                                                                             | LO2                                                         | Mastering basic German sentence structure, verb conjugations, articles, and essential vocabulary for every day communication. |
|                                                                               |                                                                                                                                                             | LO3                                                         | Enhance students' abilities in expressing themselves                                                                          |
|                                                                               |                                                                                                                                                             | LO4                                                         | Comprehending longer conversations and texts on familiar topics.                                                              |
| A9                                                                            | Communicate effectively, verbally and in writing with a range of audiences.                                                                                 | LO5                                                         | Apply the four skills of language freely.                                                                                     |
|                                                                               |                                                                                                                                                             | LO6                                                         | Develop communicative competence, encompassing listening, speaking, reading and writing skills.                               |
| A10                                                                           | Acquire and apply new knowledge and practice through German language.                                                                                       | LO7                                                         | Writing clear, coherent and well-structured essays, reports, and academic papers.                                             |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               | Information Technology- Assisted Learning |                     |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|-------------------------------------------|---------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning                        | Simulation Programs | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    |                        |            |                       | √                  | √          |                |            | √             |                                           |                     |              | √          |                 |



## Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                               | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                   |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                   |                    |                                       | Tutorial | / Practical Lab |
| 1        | Abschnitt 1: Der Artikel, die Konjugation der Verben.                             | 2                  | 2                                     | 0        | ---             |
| 2        | Abschnitt 1: Übungen, die Personal-pronomen, Negation, Alltagssituationen         | 2                  | 2                                     | 0        | ---             |
| 3        | Abschnitt 2: Der Unterricht, das Nomen, der Akkusativ, das Verb "haben"           | 2                  | 2                                     | 0        | ---             |
| 4        | Abschnitt 2: Übungen, die Fragepronomen "Wer, Wen, Was", Alltagssituationen       | 2                  | 2                                     | 0        | ---             |
| 5        | Quiz                                                                              | 2                  | 2                                     | 0        | ---             |
| 6        | Abschnitt 3: Die Zahlen, die Zeit                                                 | 2                  | 2                                     | 0        | ---             |
| 7        | Midterm Exam.                                                                     |                    |                                       |          |                 |
| 8        | Abschnitt 4 : Eine Reise, starke Verben, trennbare und untrennbare Verben         | 2                  | 2                                     | 0        | ---             |
| 9        | Abschnitt 4 : Übungen, Wortstellung, Präpositionen, Alltagssituationen            | 2                  | 2                                     | 0        | ---             |
| 10       | Abschnitt 5 : Ein Freund kommt, der Dativ ,Verben mit dem Dativ und dem Akkusativ | 2                  | 2                                     | 0        | ---             |
| 11       | Abschnitt 5 : Übungen, die Possessivpronomen                                      | 2                  | 2                                     | 0        | ---             |
| 12       | Zusätzliche Material und Quiz                                                     | 2                  | 2                                     | 0        | ---             |
| 13       | Projekt                                                                           | 2                  | 2                                     | 0        | ---             |
| 14       | Wiederholung und Quiz                                                             | 2                  | 2                                     | 0        | ---             |
| 15       | Final Exam.                                                                       |                    |                                       |          |                 |

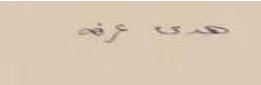
## 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | QUIZ 1 written (Semester work) | 3                               | 10            | 10%                              |
| 2   | QUIZ 2 written (Semester work) | 9                               | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15                              | 40            | 40 %                             |
| 7   | Assignments (Report & Sheet)   | 12                              | 20            | 20%                              |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | Heinz Griesbach-Dora Schulz<br>Deutsche Sprachlehre für Ausländer, 1995                                                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Other References</b>                                                                                             | 1- Friederike Jin & Ute Voß<br>Grammatik aktiv- Deutsch als Fremdsprache 2. Aktualisierte Ausgabe, Aug. 2024<br>2- PONS Verben & Zeiten Trainieren<br>Deutsch als Fremdsprache, Jan. 2020<br>3- Stephan Lübke<br>Deutsche Grammatik in kleinen Schritten, Jun 2020<br>4- Julia Brodt<br>Ein Semester in Hamburg: Roman – Deutsch lernen mit Geschichten über das Leben in Deutschland, Dec. 2024 |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | Deutsche Welle (DW)                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | <b>Notebook and data show equipped lecture room.</b>                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Supplies</b>                                                                                                     | <b>Teaching aids and computers.</b>                                                                                                                                                                                                                                                                                                                                                              |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | <b>Lab Rroom</b>                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | <b>Notebook and data show equipped lecture room.</b>                                                                                                                                                                                                                                                                                                                                             |

|             |                           |                            |
|-------------|---------------------------|----------------------------|
|             | <b>Course Coordinator</b> | <b>Program Coordinator</b> |
| <b>Name</b> |                           | Prof. Ahmed Abd El-Gafar   |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Signature</b> | Dr. Hoda Arafa.                                                                   |  |
|                  |  |                                                                                    |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |                                              |
|----------------------------|----------------------------------------------|
| التذوق الأدبي              | اسم المقرر: (تبعاً لما ورد باللائحة)         |
| <b>HUM 104</b>             | كود المقرر: (تبعاً لما ورد باللائحة)         |
| العلوم الأساسية            | القسم/الأقسام العلمية التي شاركت في التدريس: |
| إجمالي                     | إجمالي عدد الساعات المعتمدة للمقرر:          |
| أخري (تحدد)                | (تبعاً لما ورد باللائحة)                     |
| عملي                       | نوع المقرر:                                  |
| نظري                       | المستوى الدراسي الذي قدم فيه المقرر:         |
| 2                          | البرنامج الأكاديمي:                          |
| اختياري                    | المعهد:                                      |
| <b>JUNIOR</b>              | اسم منسق المقرر:                             |
| العلوم الأساسية            | جهة مناقشة واعتماد تقرير المقرر:             |
| المعهد التكنولوجي العالي   | تاريخ اعتماد تقرير المقرر:                   |
| Prof. Eid Abd El-Baset Eid |                                              |
| مجلس القسم العلمي للبرنامج |                                              |
| <b>7/26/2025</b>           |                                              |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

مفهوم النص الإبداعي وأشكال التعبير الوجداني - الأنواع الأدبية الشعرية والنثرية والمسرحية والقصصية - نظريات التلقي وتعدد قراءات الدارس للنص علي مستويات الفهم والتذوق والتحليل - أسس التشكيل الجمالي للنص من خلال تحليل : الماهية، الأدوات، الوظائف - أهمية التاريخ للنص والتجربة الأدبية من حيث علاقتها بالمبدع والمرحلة والمجتمع والبيئة - أركان النص الأدبي ومقوماته والنظريات النقدية حول أسس تحليله وتفسيره وتقويمه ونقده - النقد النظري والتطبيقي والنقد التأثري الانطباعي والنقد الموضوعي للنص قديماً وحديثاً - تطبيق إحدى نظريات التلقي واستكشاف أعماق النص علي أساس الوعي بالتحليل الجماعي للمفردات والأصوات والتراكيب والجمال وفضاءات تجارب الشعراء - دراسة آليات التذوق الأدبي وأسس تكوينه من خلال تعدد القراءات للظواهر النقدية والإبداعية - الدرس التطبيقي علي نصوص منتقاه من الشعر العربي القديم والمعاصر بما يعكس صوراً من ظاهرة الإبداع وظاهرة التلقي ومابينهما من علاقات (يمكن دراسة ظاهرة فن المعارضات الشعرية).

### 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                            |                                                                                           | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج) |                                                                                       |
|------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على |                                                                                           | A7,A10                                                                                                  |                                                                                       |
| الكود                                          | النص                                                                                      | الكود                                                                                                   | النص                                                                                  |
| LO1                                            | إدراك مفهوم النص الإبداعي وأشكال التعبير الوجداني                                         | A7                                                                                                      | العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات وذات صلة بالتذوق الأدبي |
| LO2                                            | معرفة الأنواع الأدبية الشعرية والنثرية والمسرحية والقصصية                                 |                                                                                                         |                                                                                       |
| LO3                                            | الإلمام بأسس التشكيل الجمالي للنص من خلال تحليل النصوص النثرية                            |                                                                                                         |                                                                                       |
| LO4                                            | دراسة آليات التذوق الأدبي و تطبيقها علي بعض النصوص الشعرية أو النثرية الحديثة.            |                                                                                                         |                                                                                       |
| LO5                                            | الدرس التطبيقي علي نصوص منتقاه من الشعر العربي القديم والمعاصر                            |                                                                                                         |                                                                                       |
| LO6                                            | تطبيق إحدى نظريات التلقي و إستكشاف أعماق النص علي أساس الوعي بالتحليل الجماعي للمفردات.   | A10                                                                                                     | اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة. |
| LO7                                            | تحليل أسس النصوص التأثيرية و التطبيقية من خلال تعدد القراءات للظواهر النقدية و الإبداعية. |                                                                                                         |                                                                                       |
| LO8                                            | تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق.             |                                                                                                         |                                                                                       |
| LO9                                            | إكتساب مهارات إدارة الوقت بكفاءة.                                                         |                                                                                                         |                                                                                       |
| LO10                                           | إستخدام تكنولوجيا المعلومات ومواقع الإنترنت لإكتساب مهارات التعليم الذاتي.                |                                                                                                         |                                                                                       |

### 4- طرق التعليم والتعلم للمقرر:

| التدريس المباشر |                           | التدريس الغير مباشر |                                      |                         |             |                          |                  |                  |                    |               |                  | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |                   |                             |
|-----------------|---------------------------|---------------------|--------------------------------------|-------------------------|-------------|--------------------------|------------------|------------------|--------------------|---------------|------------------|------------------------------------------------|--------------------|-------------------|-----------------------------|
| المحاضرات       | التمارين العملية والتجارب | العصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير / الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم بالإكتشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | التعلم الإلكتروني | النقاء الإصطناعي في التعليم |
| √               |                           | √                   |                                      |                         |             | √                        | √                |                  |                    | √             |                  |                                                |                    | √                 |                             |

## الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي          | المحتوى العلمي للمقرر<br>(موضوعات المقرر) | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |       |
|------------------------------------|-------------------------------------------|------------------------------------|---------------------------|-------|
|                                    |                                           |                                    | تدريس<br>نظري             | تدريب |
|                                    |                                           |                                    |                           |       |
| عملي                               | تمارين                                    |                                    |                           |       |
| 0                                  | 0                                         | 2                                  | 2                         | 1     |
| 0                                  | 0                                         | 2                                  | 2                         | 2     |
| 0                                  | 0                                         | 2                                  | 2                         | 3     |
| 0                                  | 0                                         | 2                                  | 2                         | 4     |
| 0                                  | 0                                         | 2                                  | 2                         | 5     |
| 0                                  | 0                                         | 2                                  | 2                         | 6     |
| مراجعة وامتحان منتصف الفصل الدراسي |                                           |                                    |                           |       |
| 0                                  | 0                                         | 2                                  | 2                         | 8     |
| 0                                  | 0                                         | 2                                  | 2                         | 9     |
| 0                                  | 0                                         | 2                                  | 2                         | 10    |
| 0                                  | 0                                         | 2                                  | 2                         | 11    |
| 0                                  | 0                                         | 2                                  | 2                         | 12    |
| 0                                  | 0                                         | 2                                  | 2                         | 13    |
| إختبارات الفصل الدراسي النهائية    |                                           |                                    |                           |       |
|                                    |                                           |                                    |                           | 14    |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *               | توقيت التقييم المتوقع<br>(رقم الأسبوع الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|-----------------------------|------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة) | 5                                              | 10            | 10 %                                    |
| 2 | امتحان 2 تحريري (أعمال سنة) | 12                                             | 10            | 10 %                                    |
| 3 | امتحان منتصف الفصل الدراسي  | 7                                              | 20            | 20 %                                    |
| 4 | امتحان نهائي تحريري         | 14                                             | 40            | 40 %                                    |
| 5 | تكاليفات / تقارير           | طوال الفصل                                     | 20            | 20 %                                    |

## 6- مصادر التعلم والتسهيلات المادية:

| كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل                                                                                                                                                                                           | المرجع الأساسي للمقرر<br>(لا بد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي) | مصادر التعلم<br>(الكتب والمراجع العلمية وغيرها) * |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------|
| عبد الله التطاوي، تقاطعات الحركة الشرعية بين الموروث والفردى ، الدار المصرية اللبنانية بالقاهرة، الطبعة الثانية. 2020                                                                                                                   | المراجع الأخرى                                                                  |                                                   |
| <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a><br><a href="http://www.du.edu.eg/">http://www.du.edu.eg/</a><br><a href="https://www.youtube.com/watch?bnCua19ME">https://www.youtube.com/watch?bnCua19ME</a> | المصادر الالكترونية<br>(لا بد من إضافة الروابط)                                 |                                                   |
| EKB - Microsoft office                                                                                                                                                                                                                  | المنصة التعليمية<br>(لا بد من إضافة الرابط)                                     |                                                   |
|                                                                                                                                                                                                                                         | الأجهزة                                                                         |                                                   |
| Data show, White board                                                                                                                                                                                                                  | المستلزمات                                                                      | التجهيزات التعليمية                               |
| Microsoft Teams                                                                                                                                                                                                                         | البرامج الالكترونية                                                             | المساندة للتعليم والتعلم *                        |
| -----                                                                                                                                                                                                                                   | معامل المهارات/ المحاكيات                                                       |                                                   |
| -----                                                                                                                                                                                                                                   | المعامل الافتراضية                                                              |                                                   |
| -----                                                                                                                                                                                                                                   | أخرى (تذكر)                                                                     |                                                   |

| منسق البرنامج                                                                       | منسق المقرر                |         |
|-------------------------------------------------------------------------------------|----------------------------|---------|
| أ.د. أحمد عبدالغفار                                                                 | Prof. Eid Abd El-Baset Eid | الإسم   |
|  | Prof. Eid Abd El-Baset Eid | التوقيع |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |      |             |        |                                                                 |
|----------------------------|------|-------------|--------|-----------------------------------------------------------------|
| التذوق الموسيقي            |      |             |        | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| HUM 105                    |      |             |        | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |      |             |        | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| نظري                       | عملي | اخرى (تحدد) | إجمالي | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 2                          |      |             | 2      |                                                                 |
| اختياري                    |      |             |        | نوع المقرر:                                                     |
| JUNIOR                     |      |             |        | المستوى الدراسي الذي قدم فيه المقرر:                            |
| العلوم الأساسية            |      |             |        | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |      |             |        | المعهد:                                                         |
| Prof. Eid Abd El-Baset Eid |      |             |        | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |      |             |        | جهة مناقشة واعتماد تقرير المقرر:                                |
| 7/26/2025                  |      |             |        | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

الاستماع لمجموعات الآلات الموسيقية الوركستراية وهي مجموعة الآلات الوترية – مجموعة آلات النفخ الخشبي – مجموعة آلات النفخ النحاسي – الآلات الإيقاعية، والتعرف عليها من خلال الصور المرفقة مع الملزمة الخاصة بالمقرر الدراسي – الدراسة النظرية بطريقة مختصرة تشمل جوانب المعرفة الأساسية المطلوب دراستها للعصور الموسيقية المختلفة (عصر الباروك – العصر الكلاسيكي – العصر الرومانتيكي – نبذة عن موسيقى الجاز ونشأتها – نبذة عن الموسيقى العربية وآلاتها المستخدمة) – الأهداف العامة للمقرر: بعد دراسة هذا المقرر يكون الطالب قادراً علي: التعرف بالاستماع علي الآلات الموسيقية المستخدمة في الاوركسترا – دراسة أنواع المعلومات الهامة عن موسيقى الجاز – دراسة الموسيقى العربية وآلاتها – الإلمام الكامل بأنواع الموسيقى المختلفة – المهارات الذهنية: بعد دراسة هذا المقرر يكون الطالب قادراً علي: إدراك ومعرفة أنواع الآلات الموسيقية المختلفة – تمييز أنواع المؤلفات الموسيقية المختلفة (عالمية – عربية) – معرفة تكوين الاوركسترا الغربي والشرقي وفرق الجاز – المهالات العامة: بعد دراسة هذا المقرر يكون الطالب قادراً علي: التواصل بفاعلية من خلال المناقشة والحوار – توظيف المادة العلمية في خدمة الثقافة الموسيقية – الإلمام بثقافات علمية في غير مجال التخصص – الأساليب المستخدمة للتقويم: مناقشات وشرح المحاضرة – اختبارات شفوية وتحريرية – اختبار نهاية الفصل الدراسي



### 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                            |                                                                                                                   | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصنوفة في توصيف البرنامج) |                                                                                                                                                                                                                                                                         |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على |                                                                                                                   | A3                                                                                                      |                                                                                                                                                                                                                                                                         |
| الكود                                          | النص                                                                                                              | الكود                                                                                                   | النص                                                                                                                                                                                                                                                                    |
| LO1                                            | معرفة مجموعة الآلات الوترية                                                                                       | A3                                                                                                      | تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والخالقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياق التصميم والتنمية التطوير المستدامين. |
| LO2                                            | التعرف علي أصوات مجموعات آلات النفخ الخشبي ومجموعات آلات النفخ النحاسي والتعرف علي الآلات الموسيقية من خلال الصور |                                                                                                         |                                                                                                                                                                                                                                                                         |

### 4 طرق التعليم والتعلم للمقرر:

| التدريس المباشر |                           | التدريس الغير مباشر |                                      |                         |             |                          |                  |                  |                    |               |                 | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |                   |                             |
|-----------------|---------------------------|---------------------|--------------------------------------|-------------------------|-------------|--------------------------|------------------|------------------|--------------------|---------------|-----------------|------------------------------------------------|--------------------|-------------------|-----------------------------|
| المحاضرات       | التمارين العملية والتجارب | العصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير / الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم بالاكشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | التعلم الإلكتروني | النقاء الإصطناعي في التعليم |
| ✓               |                           | ✓                   |                                      |                         |             | ✓                        | ✓                |                  |                    | ✓             |                 |                                                |                    | ✓                 |                             |

### الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي | المحتوى العلمي للمقرر<br>(موضوعات المقرر)                                        | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |       |
|---------------------------|----------------------------------------------------------------------------------|------------------------------------|---------------------------|-------|
|                           |                                                                                  |                                    | تدريس<br>نظري             | تدريب |
|                           |                                                                                  |                                    |                           |       |
| عملية                     | تمارين                                                                           |                                    |                           |       |
| 1                         | مقدمة عامة و معرفة مفهوم التذوق الموسيقي                                         | 2                                  | 2                         | 0     |
| 2                         | الموسيقي كإبداع إنساني                                                           | 2                                  | 2                         | 0     |
| 3                         | أنواع الموسيقي الشرقية والعربية                                                  | 2                                  | 2                         | 0     |
| 4                         | أنواع الآلات الوترية و تمايز نغماتها                                             | 2                                  | 2                         | 0     |
| 5                         | أنواع آلات النفخ الخشبي والنحاسي                                                 | 2                                  | 2                         | 0     |
| 6                         | التعرف علي الآلات الموسيقية المختلفة من خلال الصور                               | 2                                  | 2                         | 0     |
| 7                         | مراجعة وامتحان منتصف الفصل الدراسي                                               |                                    |                           |       |
| 8                         | كيفية تكوين الأوركسترا الغربي و الشرقي                                           | 2                                  | 2                         | 0     |
| 9                         | موسيقي الجاز و نشأتها وآلاتها                                                    | 2                                  | 2                         | 0     |
| 10                        | المقارنة بين أنواع المؤلفات الموسيقية المختلفة (عالمية و عربية)                  | 2                                  | 2                         | 0     |
| 11                        | دراسة العصور الموسيقية المختلفة(عصر الباروك- العصر الكلاسيكي- العصر الرومانتيكي) | 2                                  | 2                         | 0     |
| 12                        | توظيف المادة العلمية في خدمة الثقافة الموسيقية                                   | 2                                  | 2                         | 0     |
| 13                        | مراجعة عامه                                                                      | 2                                  | 2                         | 0     |
| 14                        | إختبارات الفصل الدراسي النهائية                                                  |                                    |                           |       |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *               | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|-----------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة) | 5                                                 | 10            | 10 %                                    |
| 2 | امتحان 2 تحريري (أعمال سنة) | 12                                                | 10            | 10 %                                    |
| 3 | امتحان منتصف الفصل الدراسي  | 7                                                 | 20            | 20 %                                    |
| 4 | امتحان نهائي تحريري         | 14                                                | 40            | 40 %                                    |
| 5 | تكليفات / تقارير            | طوال الفصل                                        | 20            | 20 %                                    |

## 6- مصادر التعلم والتسهيلات المادية:

| مصادر التعلم<br>(الكتب والمراجع<br>العلمية وغيرها)<br>* | المرجع الأساسي للمقرر<br>(لا بد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي) | كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل                                                                           |
|---------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                                                         | المراجع الأخرى                                                                  | عبد الحميد توفيق زكي: تاريخ المصريين: التذوق الموسيقي<br>وتاريخ الموسيقي المصرية، الهيئة المصرية العامة للكتاب<br>2021. |

|                                                                                                                                                                                                                                           |                                                 |                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|
| <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a><br><a href="http://www.du.edu.eg/">http://www.du.edu.eg/</a><br><a href="https://www.youtube.com/watch?=bnCua19ME">https://www.youtube.com/watch?=bnCua19ME</a> | المصادر الإلكترونية<br>(لا بد من إضافة الروابط) |                                                         |
| EKB - Microsoft office                                                                                                                                                                                                                    | المنصة التعليمية<br>(لا بد من إضافة الرابط)     |                                                         |
| قاعة محاضرات مجهزة                                                                                                                                                                                                                        | الأجهزة                                         | التجهيزات<br>التعليمية<br>المساندة للتعليم<br>والتعلم * |
| Data show, White board                                                                                                                                                                                                                    | المستلزمات                                      |                                                         |
| Microsoft Teams                                                                                                                                                                                                                           | البرامج الإلكترونية                             |                                                         |
| -----                                                                                                                                                                                                                                     | معامل المهارات/ المحاكيات                       |                                                         |
| -----                                                                                                                                                                                                                                     | المعامل الافتراضية                              |                                                         |
| -----                                                                                                                                                                                                                                     | أخرى (تذكر)                                     |                                                         |

| منسق البرنامج                                                                     | منسق المقرر                |         |
|-----------------------------------------------------------------------------------|----------------------------|---------|
| أ.د. أحمد عبدالغفار                                                               | Prof. Eid Abd El-Baset Eid | الإسم   |
|  | Prof. Eid Abd El-Baset Eid | التوقيع |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |      |             |        |                                                                 |
|----------------------------|------|-------------|--------|-----------------------------------------------------------------|
| الإتجاهات الفنية المعاصرة  |      |             |        | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| HUM 107                    |      |             |        | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |      |             |        | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| نظري                       | عملي | اخرى (تحدد) | إجمالي | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 2                          |      |             | 2      |                                                                 |
| اختياري                    |      |             |        | نوع المقرر:                                                     |
| JUNIOR                     |      |             |        | المستوى الدراسي الذي قدم فيه المقرر:                            |
| البرامج الهندسية           |      |             |        | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |      |             |        | المعهد:                                                         |
|                            |      |             |        | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |      |             |        | جهة مناقشة واعتماد تقرير المقرر:                                |
| 7/26/2025                  |      |             |        | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

يهدف المقرر إلى: إكساب الطالب القدرة على التذوق الفني - إكساب الطالب مهارة قراءة الأعمال الفنية وذلك من خلال دراسة الفلسفات والاتجاهات المذاهب المعاصرة الحديثة وما بعد الحداثة. ويحتوي المقرر على الموضوعات التالية : التعريف بالفنون القديمة كمدخل للفلسفات الكلاسيكية - مدخل للفنون الكلاسيكية والأصول اليونانية - الكلاسيكية الجديدة (أهم المصورين و المثاليين) - الحداثة وحركة التأثيريين الفرنسيين (صالون الشباب) سيزان، مافيه، مونيه - التكعيبية (بارك، بيكاسو) ، المستقبلية (بوتشيني) البعد الزمني- التجريدي (كاندنسيكي- موندريان) - الاتجاه التعبيري (إدوارد مونخ ، فان جوخ) في ألمانيا الوحشية - التلقائية (بول كيلي- خوان ميرو) - الاتجاهات الحديثة والفن الحر- الاتجاهات الحديثة في الفنون المصرية ( الحركة التشكيلية المصرية المعاصرة) - الفنانين المصريين المثاليين ( محمود مختار- صبحي جرجس- السجيني - الوشاحي) - المصورين المصريين ( محمود سعيد، يوسف كامل، راغب عياد، عبد العزيز درويش) فنانين مصريين عالميين ( صلاح عبد الكريم، حامد ندى، ناجي شاكور) - ما بعد الحداثة وأهم اتجاهاتها.

### 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                                                                                                                       |       | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعا للمصفوفة في توصيف البرنامج) |                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| عند الانتهاء من المقرر سيكون الطالب قادرا على                                                                                             |       | A3,A4, A5, A6,A10                                                                                      |                                                                                                                                                                                                                                                                         |
| النص                                                                                                                                      | الكود | النص                                                                                                   | الكود                                                                                                                                                                                                                                                                   |
| يتعرف على أهمية الفنون الحديثة المعاصرة خاصة (الابداع الرسومي)                                                                            | LO1   | A3                                                                                                     | تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والخالقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياق التصميم والتنمية التطوير المستدامين. |
| يتعرف على أهم المؤثرات التي ساهمت في إظهار الأعمال الفنية للرسامين العالميين .                                                            | LO2   |                                                                                                        |                                                                                                                                                                                                                                                                         |
| يلخص مصادر ومكانة الأعمال الفنية للرسامين في أوروبا القديمة والمعاصرة                                                                     | LO3   | A4                                                                                                     | الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.                                                                                                                                   |
| يستنتج الدور الحيوي والرئيسي للعمل الفني المعاصر                                                                                          | LO4   |                                                                                                        |                                                                                                                                                                                                                                                                         |
| يربط بين التأثير والتأثر بين الفنون الرسومية القديمة والحديثة.                                                                            | LO5   |                                                                                                        |                                                                                                                                                                                                                                                                         |
| يقارن بين الأعمال الفنية المصرية المعاصرة و الفنية المصرية القديمة ، و يربط بين الفلسفيات القديمة والمعاصرة في الاعمال الفنية.            | LO6   |                                                                                                        |                                                                                                                                                                                                                                                                         |
| يثمن قيمة العلم والمعرفة و يثمن دور العقول المصرية التي أبدعت في كافة الميادين.                                                           | LO7   | A5                                                                                                     | ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.                                                                                                                                                                                                            |
| يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية في مجال الفنون.                                                                      | LO8   |                                                                                                        |                                                                                                                                                                                                                                                                         |
| يظهر مهارات إدارة الوقت بكفاءة في مجال أى مهنة ترتبط بالفنون .                                                                            | LO9   | A6                                                                                                     | التخطيط والإشراف والرقابة علي تنفيذ المشاريع الهندسية مع مراعاة متطلبات الحرف الأخرى                                                                                                                                                                                    |
| تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل بحيث يعمل ضمن فريق يظهر مهارات التواصل مع الآخرين، و كذلك قدرات التعلم الذاتي . | LO10  | A10                                                                                                    | اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.                                                                                                                                                                                   |

### 4 طرق التعليم والتعلم للمقرر:

| التدريس المباشر |                           | التدريس الغير مباشر |                                      |                         |             |                          |                  |                  |                    |               |                  | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |                   |                             |
|-----------------|---------------------------|---------------------|--------------------------------------|-------------------------|-------------|--------------------------|------------------|------------------|--------------------|---------------|------------------|------------------------------------------------|--------------------|-------------------|-----------------------------|
| المحاضرات       | التمارين العملية والتجارب | العصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير / الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم بالاختشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | التعلم الالكتروني | النقاء الاصطناعي في التعليم |
| ✓               |                           | ✓                   |                                      |                         |             | ✓                        | ✓                |                  |                    | ✓             |                  |                                                |                    | ✓                 |                             |

## الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي | المحتوى العلمي للمقرر<br>(موضوعات المقرر)                                                                                            | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |       |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------|-------|
|                           |                                                                                                                                      |                                    | تدريس<br>نظري             | تدريب |
|                           |                                                                                                                                      |                                    |                           |       |
| عملية                     | تمارين                                                                                                                               |                                    |                           |       |
| 1                         | التعريف بالفنون القديمة كمدخل للفلسفات الكلاسيكية                                                                                    | 2                                  | 2                         | 0     |
| 2                         | مدخل للفنون الكلاسيكية والأصول اليونانية                                                                                             | 2                                  | 2                         | 0     |
| 3                         | الكلاسيكية الجديدة (أهم المصورين و المثاليين) الحداثة وحركة التأثيريين الفرنسيين (صالون الشباب) سيزان، مافيه، مونيه                  | 2                                  | 2                         | 0     |
| 4                         | التكعيبية (بارك، بيكاسو) ، المستقبلية (بوتشيني).                                                                                     | 2                                  | 2                         | 0     |
| 5                         | البعد الزمني- التجريدي (كاندنسيكي- موندريان)                                                                                         | 2                                  | 2                         | 0     |
| 6                         | الاتجاه التعبيري (إدوارد مونخ ، فان جوخ) في ألمانيا الوحشية                                                                          | 2                                  | 2                         | 0     |
| 7                         | مراجعة وامتحان منتصف الفصل الدراسي                                                                                                   |                                    |                           |       |
| 8                         | الاتجاهات الحديثة والفن الحر                                                                                                         | 2                                  | 2                         | 0     |
| 9                         | الاتجاهات الحديثة في الفنون المصرية ( الحركة التشكيلية المصرية المعاصرة)                                                             | 2                                  | 2                         | 0     |
| 10                        | الفنانين المصريين المثاليين ( محمود مختار- صبحي جرجس- السجيني – الوشاحي)                                                             | 2                                  | 2                         | 0     |
| 11                        | المصورين المصريين (محمود سعيد، يوسف كامل، راغب عياد، عبد العزيز درويش) فنانين مصريين عالميين (صلاح عبد الكريم، حامد ندى، ناجي شاكرا) | 2                                  | 2                         | 0     |
| 12                        | ما بعد الحداثة وأهم اتجاهاتها                                                                                                        | 2                                  | 2                         | 0     |
| 13                        | مراجعة عامه                                                                                                                          | 2                                  | 2                         | 0     |
| 14                        | إختبارات الفصل الدراسي النهائية                                                                                                      |                                    |                           |       |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *               | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|-----------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة) | 5                                                 | 10            | 10 %                                    |
| 2 | امتحان 2 تحريري (أعمال سنة) | 12                                                | 10            | 10 %                                    |
| 3 | امتحان منتصف الفصل الدراسي  | 7                                                 | 20            | 20 %                                    |
| 4 | امتحان نهائي تحريري         | 14                                                | 40            | 40 %                                    |
| 5 | تكليفات / تقارير            | طوال الفصل                                        | 20            | 20 %                                    |

## 6- مصادر التعلم والتسهيلات المادية:

|                                                                                                                                                                                                                                           |                                                                                |                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------|
| كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل                                                                                                                                                                                             | المرجع الأساسي للمقرر<br>(لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي) | مصادر التعلم<br>(الكتب والمراجع<br>العلمية وغيرها)<br>* |
| محمود خالد بشايرة ، التربية الفنية وتنمية التفكير-اتجاهات<br>حديثه في التدريس، عالم الكتب الحديث 25 أبريل 2019                                                                                                                            | المراجع الأخرى                                                                 |                                                         |
| <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a><br><a href="http://www.du.edu.eg/">http://www.du.edu.eg/</a><br><a href="https://www.youtube.com/watch?=bnCua19ME">https://www.youtube.com/watch?=bnCua19ME</a> | المصادر الالكترونية<br>(لابد من إضافة الروابط)                                 |                                                         |
| EKB - Microsoft office                                                                                                                                                                                                                    | المنصة التعليمية<br>(لابد من إضافة الرابط)                                     |                                                         |
| قاعة محاضرات مجهزة                                                                                                                                                                                                                        | الأجهزة                                                                        | التجهيزات<br>التعليمية<br>المساندة للتعليم<br>والتعلم * |
| Data show, White board                                                                                                                                                                                                                    | المستلزمات                                                                     |                                                         |
| Microsoft Teams                                                                                                                                                                                                                           | البرامج الالكترونية                                                            |                                                         |
| -----                                                                                                                                                                                                                                     | معامل المهارات/ المحاكيات                                                      |                                                         |
| -----                                                                                                                                                                                                                                     | المعامل الافتراضية                                                             |                                                         |
| -----                                                                                                                                                                                                                                     | أخرى (تذكر)                                                                    |                                                         |

| منسق البرنامج                                                                      | منسق المقرر |         |
|------------------------------------------------------------------------------------|-------------|---------|
| أ.د. أحمد عبدالغفار                                                                |             | الإسم   |
|  |             | التوقيع |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                 |                        |                 |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------|------------------------|-----------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Analysis &amp; Research Skills</b>     |                 |                        |                 |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>HUM 109</b>                            |                 |                        |                 |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCE</u></b>               |                 |                        |                 |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Tutorial</b> | <b>Other (specify)</b> | <b>Total</b>    |
|                                                                                                                 | <b><u>1</u></b>                           | <b><u>2</u></b> |                        | <b><u>3</u></b> |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                 |                        |                 |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                 |                        |                 |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                 |                        |                 |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                 |                        |                 |
| <b>Name of Course Coordinator:</b>                                                                              |                                           |                 |                        |                 |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                 |                        |                 |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                 |                        |                 |

## 2. Course Overview (Brief summary of scientific content):

To Introduce Analysis & Research Skills this include studying the framework for analyzing engineering problems considering technical, economic, environmental, and ethical issues. Phases of problem solving (Understanding the problem and formulating it, Solution plan, implementation plan, Evaluation, and Revision). Role of creativity in the analysis for different alternatives. SWOT (strengths, Weaknesses, Opportunities, and Threats) analysis for different alternatives. Cost – Benefit analysis and Risk analysis. Role



of cooperation and team – work in analyzing large engineering problems. Importance of finding the relevant data, information, and knowledge. Basics Web search methods and how to formulate search engine queries using logical connectives (e.g. AND, OR, NOT). Phrase, title, domain, URL, and link search. Evaluating search results, choosing the appropriate search engine. Importance of evaluating the credibility of the different web sites.

### **3. Course Learning Outcomes CLOs :**

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                              | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                          |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(A6, A8, A9, A10)</b>                                                         |                                                                                                                                              | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                          |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                  | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                              |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                     | <b>LO1</b>                                                         | Solving problems related to SWOT analysis, decision making, team work decision.                                                                          |
|                                                                                  |                                                                                                                                              | <b>LO2</b>                                                         | Working in a team group.                                                                                                                                 |
| <b>A8</b>                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                         | <b>LO3</b>                                                         | Describe the main concepts of basics Web search methods.                                                                                                 |
|                                                                                  |                                                                                                                                              | <b>LO4</b>                                                         | Explain the main principle of Role of creativity in the analysis for different alternatives.                                                             |
|                                                                                  |                                                                                                                                              | <b>LO5</b>                                                         | Elucidate the main principal SWOT analysis for different alternatives.                                                                                   |
|                                                                                  |                                                                                                                                              | <b>LO6</b>                                                         | Clarify the main principal Cost – Benefit analysis and Risk analysis.                                                                                    |
| <b>A9</b>                                                                        | Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations | <b>LO7</b>                                                         | Evaluating search results, choosing the appropriate search engine.                                                                                       |
|                                                                                  |                                                                                                                                              | <b>LO8</b>                                                         | Assess issues of Phases of problem solving (Understanding the problem and formulating it, Solution plan, Implementation plan, Evaluation, and Revision). |
| <b>A10</b>                                                                       | Acquire and apply new knowledge and practice self, lifelong and other learning strategies.                                                   | <b>LO9</b>                                                         | Design the problems of role of cooperation and team – work in analyzing large engineering problems.                                                      |
|                                                                                  |                                                                                                                                              | <b>LO10</b>                                                        | Perform and explain the gained knowledge orally.                                                                                                         |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                              | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                  |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                  |                    |                                       | Tutorial | Practical Lab / |
| 1        | Basics Web search methods<br>Phrase, title, domain, URL, and link search.                                        | 3                  | 1                                     | 2        | 0               |
| 2        | How to formulate search engine queries using logical connectives (e.g. AND, OR, NOT).                            | 3                  | 1                                     | 2        | 0               |
| 3        | Evaluating search results, choosing the appropriate search engine.                                               | 3                  | 1                                     | 2        | 0               |
| 4        | Importance of evaluating the credibility of the different web sites.                                             | 3                  | 1                                     | 2        | 0               |
| 5        | Framework for analyzing engineering problems considering technical, economic, environmental, and ethical issues. | 3                  | 1                                     | 2        | 0               |

|    |                                                                                                                                         |   |   |   |   |
|----|-----------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 6  | Phases of problem solving (Understanding the problem and formulating it, Solution plan, Implementation plan, Evaluation, and Revision). | 3 | 1 | 2 | 0 |
| 7  | Revision and Mid Exam                                                                                                                   |   |   |   |   |
| 8  | Role of creativity in the analysis for different alternatives.                                                                          | 3 | 1 | 2 | 0 |
| 9  | SWOT (strengths, Weaknesses, Opportunities, and Threats) analysis for different alternatives.                                           | 3 | 1 | 2 | 0 |
| 10 | Cost – Benefit analysis and Risk analysis.                                                                                              | 3 | 1 | 2 | 0 |
| 11 | Role of cooperation and team – work in analyzing large engineering problems.                                                            | 3 | 1 | 2 | 0 |
| 12 | Importance of finding the relevant data, information, and knowledge                                                                     | 3 | 1 | 2 | 0 |
| 13 | Revision                                                                                                                                | 3 | 1 | 2 | 0 |
| 14 | Final Exam.                                                                                                                             |   |   |   |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 4                               | 10            | 10                               |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10                               |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | presentation skills            | 9,10                            | 10            | 10                               |
| 6   | Assignments                    | 11                              | 10            | 10                               |

### **6- Learning Resources and Supportive Facilities \***

|                                              |                                                                                               |                                                                                             |
|----------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific | HTI; Available Hard copy .<br><br>Available Presentation (handed to students' part by part) |
|----------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|

| references,<br>etc.) *                                        | documentation<br>method)                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                               | Other References                            | <p>1-G.R.Notess, Tesching Web Search Skills, information Today Inc., 2021.</p> <p>2-D.Newnan, T.Eshenbach, and J.Lavelle, Engineering Economic Analysis, Oxford University Press, fourteenth edition, 2019.</p> <p>3-Search skills for researchers “workshop”, Engineering economic analysis by Donald G. Newnan .et., al, 2018.</p> <p>4-G.R.Notess, Tesching Web Search Skills, information Today Inc., 2021.</p> <p>5-D.Newnan, T.Eshenbach, and J.Lavelle, Engineering Economic Analysis, Oxford University Press, fourteenth edition, 2019.</p> <p>6-Murray, R. 2018: How to survive your viva. Maidenhead:Open University Press.</p> <p>7-Rugg, G. &amp; Petre, M. 2021: The unwritten rules of PhD research. Maidenhead:Open University Press.</p> <p>8-Tinkler, P. &amp; Jackson, C. 2021: The doctoral examination process: a handbook for students, examiners and supervisors. The Society for Research into Higher Education. Maidenhead:Open University Press.</p> |
|                                                               | Electronic Sources<br>(Links must be added) | <a href="http://www.scribd.com/anh_ch%C3%A2u_6/d/62390771-Change-Management-Best-Practice-Guide">http://www.scribd.com/anh_ch%C3%A2u_6/d/62390771-Change-Management- Best-Practice-Guide</a> >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                               | Learning Platforms<br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Supportive facilities & equipment for teaching and learning * | Devices/Instruments                         | Notebook and data show                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                               | Supplies                                    | data show equipped lecture room                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                               | Electronic Programs                         | Microsoft power point                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|           | Course Coordinator | Program Coordinator                                                                 |
|-----------|--------------------|-------------------------------------------------------------------------------------|
| Name      |                    | PROF. Ahmed Abd El-Gafar                                                            |
| Signature |                    |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Hydraulics (2)</b>                     |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 151</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Fluid flow around immersed objects, unsteady flow in open and closed conduits, engineering applications.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                              |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------|
| <b>A1, B1, B2</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                              |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                  |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic Science and mathematics.                                                                                                                                                                                                                                                                            | <b>LO1</b>                                                         | Define the flow through pipes.                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Mention the velocity and shear distribution for laminar flow |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                                                         | Writing the Excel sheet to solve the pipe network problems.  |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO4</b>                                                         | Identify and select of economical pipe diameter and pump.    |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.                                              | <b>LO5</b>                                                         | Design of hydraulic pump system.                             |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       | √                  |            |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                     | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                         |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                         |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to flow through pipes, describing different types of flow and flow regimes | 3                  | 2                                     | 0        | 1               |
| 2        | Studying the basic flow equations                                                       | 3                  | 2                                     | 0        | 1               |
| 3        | Studying the different types of losses                                                  | 3                  | 2                                     | 0        | 1               |
| 4        | Studying different equations for laminar flow.                                          | 3                  | 2                                     | 0        | 1               |
| 5        | Studying different equations for turbulent flow                                         | 3                  | 2                                     | 0        | 1               |
| 6        | pipe connection.                                                                        | 3                  | 2                                     | 0        | 1               |
| 7        | Revision and Mid Exam                                                                   |                    |                                       |          |                 |



|       |                                                             |   |   |   |   |
|-------|-------------------------------------------------------------|---|---|---|---|
| 8     | Three tank problem, and four tanks provided with pump.      | 3 | 2 | 0 | 1 |
| 9     | Pipe network                                                | 3 | 2 | 0 | 1 |
| 10    | Introduction to hydraulic machinery                         | 3 | 2 | 0 | 1 |
| 11    | Economical pipe diameter, and different uses of pumps       | 3 | 2 | 0 | 1 |
| 12    | Connection of pumps and velocity diagrams for pumps         | 3 | 2 | 0 | 1 |
| 13    | Connection of pumps and velocity diagrams for pumps (cont.) | 3 | 2 | 0 | 1 |
| 14    | Revision                                                    | 3 | 2 | 0 | 1 |
| 15,16 | <b>Final Exam.</b>                                          |   |   |   |   |

### **Experiment Topics: (If any)**

| Serial | Experiment                                   |
|--------|----------------------------------------------|
| 1      | Experimental work for open channel hydraulic |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 6                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments                    | weekly                          | 15            | 15 %                             |
| 6   | Final Practical                | 14                              | 5             | 5 %                              |

### **6- Learning Resources and Supportive Facilities \***

| Learning resources | The main (essential) reference (must be written in full according to the scientific documentation method)                       |  |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------|--|
|                    | <ul style="list-style-type: none"> <li>S.K. Sharma, Hydraulic Structures Design of Irrigation Structures, RSM Press,</li> </ul> |  |

|                                               |                                                                          |                                                                                                                                                                                                                                                      |
|-----------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(books, scientific references, etc.) *</b> |                                                                          | ISBN-13: 978-9352533770, January 2017.<br>• Irrigation Engineering and Hydraulic, Dr. S.K.Sharma, S.Chand PUBLISHING, 12171, NEW DELHI, 2016<br>• Civil Engineering Hydraulics: Essential Theory with Worked Examples, Martin Marriott, May 2, 2016. |
|                                               | <b>Other References</b>                                                  | • C. Nalluri, Martin Marriott, Civil Engineering Hydraulics, Wiley – Blackwell, 5th. Ed., 2009.<br>• Lecturer Notes in Hydraulics (Dr. Osama Khairy, Dr. Yasser Khairy)<br>• A Text Book of Hydrology Open Channel Hydraulics DESIGN by Terry W.     |
|                                               | <b>Electronic Sources</b><br>(Links must be added)                       | • <a href="https://www.hydraulics.org/">https://www.hydraulics.org/</a>                                                                                                                                                                              |
|                                               | <b>Learning Platforms</b><br>(Links must be added)                       | EKB - Microsoft office                                                                                                                                                                                                                               |
|                                               | <b>Supportive facilities &amp; equipment for teaching and learning *</b> |                                                                                                                                                                                                                                                      |
|                                               | <b>Devices/Instruments</b>                                               | Hydraulic laboratory                                                                                                                                                                                                                                 |
|                                               | <b>Supplies</b>                                                          | Data Show, White Board – MS Team                                                                                                                                                                                                                     |
|                                               | <b>Electronic Programs</b>                                               | --                                                                                                                                                                                                                                                   |
|                                               | <b>Skill Labs/ Simulators</b>                                            | --                                                                                                                                                                                                                                                   |
|                                               | <b>Virtual Labs</b>                                                      | --                                                                                                                                                                                                                                                   |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Diploma Project</b>                    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 152</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Civil Engineering</b>                  |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 |                                           | <u>4</u>         |                        | <u>4</u>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b>Civil Engineering</b>                  |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | DR. Yasser H. Helal                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

The student selects one of several subjects offered including computer aided drafting, quantity take-off for engineering projects, etc....

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                | <b>Course Learning Outcomes</b>                                    |                                                                                                                      |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>A3, A5, A9, B1</b>                                                            |                                                                                                                                                                                                                                                                                | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                      |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                    | <b>Code</b>                                                        | <b>Text</b>                                                                                                          |
| <b>A3</b>                                                                        | Apply engineering design processes to meet structure needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO1</b>                                                         | Employ the Revit Program                                                                                             |
|                                                                                  |                                                                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Apply engineering design processes to obtain suitable design of building..                                           |
| <b>A5</b>                                                                        | Practice design techniques and methods of investigation as an inherent part of learning                                                                                                                                                                                        | <b>LO3</b>                                                         | Practice design techniques of Revit program                                                                          |
|                                                                                  |                                                                                                                                                                                                                                                                                | <b>LO4</b>                                                         | Use the correct design rules to reach the best result                                                                |
| <b>A9</b>                                                                        | Use creative, innovative, and flexible thinking to anticipate and respond to new situations.                                                                                                                                                                                   | <b>LO5</b>                                                         | Use creative, innovative, and flexible thinking to achieve full structure design.                                    |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques           | <b>LO6</b>                                                         | Choose AutoCAD and Revit program for construction of buildings, and infrastructures using civil engineering concepts |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       |                    |            |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics) | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                     |                    |                                       | Tutorial | / Practical Lab |
| 1        | Introduction of REVIT                               | 4                  | -                                     | -        | 4               |
| 2        | Draw levels and grid                                | 4                  | -                                     | -        | 4               |
| 3        | Design foundation part 1                            | 4                  | -                                     | -        | 4               |
| 4        | Design foundation part 2                            | 4                  | -                                     | -        | 4               |
| 5        | Design columns                                      | 4                  | -                                     | -        | 4               |
| 6        | Design beams and introduction for slabs             | 4                  | -                                     | -        | 4               |
| 7        | Revision and Mid Exam                               |                    |                                       |          |                 |
| 8        | Continue design of slab                             | 4                  | -                                     | -        | 4               |

|    |                                                                    |   |   |   |   |
|----|--------------------------------------------------------------------|---|---|---|---|
| 9  | How to import from AutoCAD                                         | 4 | - | - | 4 |
| 10 | Design walls                                                       | 4 | - | - | 4 |
| 11 | structure Project. <a href="#">Implementing real project board</a> | 4 | - | - | 4 |
| 12 | finish structure Project                                           | 4 | - | - | 4 |
| 13 | REVISION                                                           | 4 | - | - | 4 |
| 14 | <b>Final Exam.</b>                                                 |   |   |   |   |

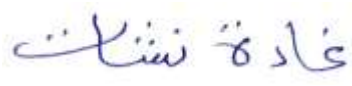
### **5- Methods of students' assessment:**

| No. | Assessment Methods * | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------|---------------------------------|---------------|----------------------------------|
| 1   | C.W.1                | 3                               | 5             | 5%                               |
| 2   | C.W.2                | 4                               | 5             | 5%                               |
| 3   | QUIZ 1               | 5                               | 5             | 5%                               |
| 4   | Midterm exam         | 7                               | 30            | 30 %                             |
| 5   | QUIZ 2               | 9                               | 5             | 5%                               |
| 6   | PROJECT EVALUATION   | 13                              | 20            | 20%                              |
| 7   | Final LAB Exam       | 14                              | 30            | 30%                              |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) |                                                                                                               |
|                                                                  | <b>Other References</b>                                                                                             | ASCENT., "Autodesk Revit 2023 Structure Fundamentals", ISBN: 978-1-63057-518-2., Published November 17, 2022. |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  |                                                                                                               |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching</b>        | <b>Devices/Instruments</b>                                                                                          | Computer Lab                                                                                                  |
|                                                                  | <b>Supplies</b>                                                                                                     |                                                                                                               |
|                                                                  | <b>Electronic Programs</b>                                                                                          |                                                                                                               |
|                                                                  | <b>Skill Labs/ Simulators</b>                                                                                       |                                                                                                               |
|                                                                  | <b>Virtual Labs</b>                                                                                                 |                                                                                                               |

|                       |                                |  |
|-----------------------|--------------------------------|--|
| <b>and learning *</b> | <b>Other</b> (to be mentioned) |  |
|-----------------------|--------------------------------|--|

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>DR. Yasser Helal</b>                                                           | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Reinforced Concrete (1)</b>            |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 153</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <u>2</u>                                  | <u>2</u>         |                        | <u>4</u>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Fundamentals and design theories based on ultimate strength design and elastic concepts. Egyptian and ACI Code requirements. Load factors. Analysis and design of reinforced concrete members subject to flexure, shear and diagonal tension in accordance to strength method. Bond, anchorage and development length. Deflection and crack control.

### 3. Course Learning Outcomes CLOs :



**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                          |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A1, A2, A3, A4, A10<br/>B1, B2</b>                                            |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                          |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                              |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.                                                                                                                                                                                   | <b>LO1</b>                                                         | Identify the concrete properties of flexure members to solve engineering-based design problems by applying design formulas.                                              |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions                                                                                                    | <b>LO2</b>                                                         | Conduct design parameters of flexure members.                                                                                                                            |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO3</b>                                                         | Employ the Egyptian code in the design of flexure members.                                                                                                               |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development | <b>LO4</b>                                                         | Apply the design process of reinforced concrete solid slab systems to produce a cost-effective design.                                                                   |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles                                                                                                                                        | <b>LO5</b>                                                         | Utilize code practices and standards to design appropriate solid slab systems.                                                                                           |
| <b>A10</b>                                                                       | Acquire and apply new knowledge; and practice self, lifelong, and other learning strategies                                                                                                                                                                                                                         | <b>LO6</b>                                                         | Applying new knowledge in solid slab design and construction involves utilizing advanced techniques, such as reinforced concrete, post-tensioning, and precast elements. |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil                                                                               | <b>LO7</b>                                                         | Calculate the shear capacity of concrete.                                                                                                                                |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO8</b>                                                         | Utilize the Egyptian code in the design and construction of reinforced concrete structures.                                                                              |

|           |                                                                                                                                                                                                                                                                                                                                                                 |             |                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------|
|           | engineering concepts and techniques of Structural Analysis and Mechanics, Properties, and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics..                                                                                                                                                                                     |             |                                                                                 |
|           |                                                                                                                                                                                                                                                                                                                                                                 | <b>LO9</b>  | Select the appropriate structural system.                                       |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources, and Harbors; or any other emerging field relevant to the discipline. | <b>LO10</b> | Achieve optimum design of solid slab-system and flexure members.                |
|           |                                                                                                                                                                                                                                                                                                                                                                 | <b>L11</b>  | Analysis of the shear strength of concrete and the safe design of beam element. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    |                      | ✓                      |            | ✓                     | ✓                  |            |                |            | ✓             |                    |                                          |              | ✓          |                 |

**Course Schedule:**

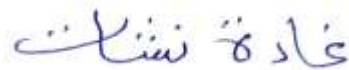
| Week No. | Scientific content of the course<br>(Course Topics)                     | Total<br>Weekly<br>Hours | Expected number of the Learning<br>Hours |          |                    |
|----------|-------------------------------------------------------------------------|--------------------------|------------------------------------------|----------|--------------------|
|          |                                                                         |                          | Theoretical<br>teaching<br>(lectures)    | Training |                    |
|          |                                                                         |                          |                                          | Tutorial | Practical /<br>Lab |
| 1        | Introduction to building material and structure straining actions.      | 4                        | 2                                        | 2        | —                  |
| 2        | Analysis of uncracked section.                                          | 4                        | 2                                        | 2        | —                  |
| 3        | Check of stresses on existing concrete section.                         | 4                        | 2                                        | 2        | —                  |
| 4        | Ultimate flexure capacity of the existing section.                      | 4                        | 2                                        | 2        | —                  |
| 5        | Design of flexure members using the ultimate limit-state design method. | 4                        | 2                                        | 2        | —                  |
| 6        | Achieve ductile design members.                                         | 4                        | 2                                        | 2        | —                  |
| 7        | <b>Revision and Mid Exam</b>                                            |                          |                                          |          |                    |
| 8        | Using design aids.                                                      | 4                        | 2                                        | 2        | —                  |
| 9        | Adopt a suitable solid slab system for one-way and two ways slabs.      | 4                        | 2                                        | 2        | —                  |
| 10       | Loads applied on reinforced concrete flexure beams.                     | 4                        | 2                                        | 2        | —                  |
| 11       | Analysis and design of solid slabs.                                     | 4                        | 2                                        | 2        | —                  |
| 12       | Analysis and design of flexure beams.                                   | 4                        | 2                                        | 2        | —                  |
| 13       | Shear design theory of reinforced concrete section.                     | 4                        | 2                                        | 2        | —                  |
| 14       | Splice and development length of steel bars.                            | 4                        | 2                                        | 2        | —                  |
| 15,16    | <b>Final Exam.</b>                                                      |                          |                                          |          |                    |

### 5- Methods of students' assessment:

| No. | Assessment Methods * | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------|---------------------------------|---------------|----------------------------------|
| 1   | Research Report      | 2                               | 10            | 10%                              |
| 2   | Assignments          | 6                               | 15            | 15 %                             |
| 3   | Midterm exam         | 7                               | 20            | 20 %                             |
| 4   | Project              | 5                               | 15            | 15%                              |
| 5   | Final Written Exam   | 15, 16                          | 40            | 40 %                             |

### 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>DESIGN OF CONCRETE STRUCTURES DAVID DARWIN 2016</li> <li>Design of reinforced concrete structures: Dr. M. Goneem 2019</li> <li>Design and construction of reinforced concrete structures ECP-203-2018</li> <li>Loads applied on building ECP-208</li> </ul>                                                                                                                                                                      |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>ASCE: American society of civil Engineering.</li> <li>BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                                                                  |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html</a></li> <li><a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li><a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Supplies</b>                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Electronic Programs</b>                                                                                          | AutoCAD program<br>CSI programs (SAP)                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Virtual Labs</b>                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Prof. Essam Khalifa</b>                                                        | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Steel Structures (1)</b>               |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 154</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Mohammed Fathi Belal                  |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Fundamentals and principles necessary for the design of steel structures. Egyptian and American codes. Steel properties, Loads, Design of Tension members, Design of Compression members; Design of Bolted Connections and Design of Welded Connections. Structural systems including Trusses.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                            | <b>Course Learning Outcomes</b>                                    |                                                                                                                                        |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A4, A10, B1, B2</b>                                                   |                                                                                                                                                                                                                                                                                                                            | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                        |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                | <b>Code</b>                                                        | <b>Text</b>                                                                                                                            |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                         | <b>LO1</b>                                                         | Choose the suitable structural system for the steel truss.                                                                             |
|                                                                                  |                                                                                                                                                                                                                                                                                                                            | <b>LO2</b>                                                         | Calculate the loads on a typical steel truss and compute the internal forces of the truss and their design strengths.                  |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.        | <b>LO3</b>                                                         | Apply the design specification requirements to get the most economic cross-sections for truss.                                         |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                               | <b>LO4</b>                                                         | Use the design strength for the truss component and beam according to the Egyptian code of practice.                                   |
|                                                                                  |                                                                                                                                                                                                                                                                                                                            | <b>LO5</b>                                                         | Employ the structural connections that are integrated parts of the overall structural design.                                          |
| <b>A10</b>                                                                       | Acquire and apply new knowledge; and practice self, lifelong, and other learning strategies.                                                                                                                                                                                                                               | <b>LO6</b>                                                         | Develop student ability of to self-extract and manipulate data from different sources, textbooks, and international codes.             |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and | <b>LO7</b>                                                         | Utilize advanced numerical software techniques like computer software packages (SAP2000 and/or ETABS) for the analysis of steel truss. |

|           |                                                                                                                                                                                                                                                                                                                                                                |            |                                                                                                                                                       |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                                                                                                                                                               |            |                                                                                                                                                       |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO8</b> | Carry out the design of the structural truss and their connections that are integrated parts of the overall structural design as well as beam design. |
|           |                                                                                                                                                                                                                                                                                                                                                                | <b>LO9</b> | Produce design drawing necessary for cost estimation.                                                                                                 |

#### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       | √                  |            |                |            | √             |                    |                                          |              |            |                 |

#### **Course Schedule:**

| Week No. | Scientific content of the course<br>(Course Topics)    | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                        |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                        |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to Steel Systems for Industrial Buildings | 4                  | 2                                     | 2        | 0               |



|       |                                                                                                                                                                                                   |   |   |   |   |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 2     | General Lay-out for Steel Systems for Industrial Buildings                                                                                                                                        | 4 | 2 | 2 | 0 |
| 3     | Types of Loads (Dead, Live, Wind)<br><a href="#">Conduct presentations to help students understand and software programs.</a>                                                                     | 4 | 2 | 2 | 0 |
| 4     | Design of Tension members (ECOP)                                                                                                                                                                  | 4 | 2 | 2 | 0 |
| 5     | Design of Tension members (AISC)                                                                                                                                                                  | 4 | 2 | 2 | 0 |
| 6     | Design of Compression members (ECOP)                                                                                                                                                              | 4 | 2 | 2 | 0 |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                      |   |   |   |   |
| 8     | Design of Compression members (AISC)                                                                                                                                                              | 4 | 2 | 2 | 0 |
| 9     | Analysis & Design of Bracing Systems for Industrial Buildings.<br><a href="#">Align support sessions with current lecture topics and include problem-solving activities.</a>                      | 4 | 2 | 2 | 0 |
| 10    | Detailing of Concentric shear Connections (ordinary bolted Connection)                                                                                                                            | 4 | 2 | 2 | 0 |
| 11    | Detailing of Concentric shear Connections (high strength bolted Connection)<br><a href="#">Introduce advanced project focusing on arched truss including peer review and instructor feedback.</a> | 4 | 2 | 2 | 0 |
| 12    | Detailing of Concentric shear Connections (fillet welded Connection)<br><a href="#">Conduct a student feedback survey to evaluate effectiveness and adjust the approach accordingly</a>           | 4 | 2 | 2 | 0 |
| 13    | Design of Laterally Supported Simple Beams (ECOP)                                                                                                                                                 | 4 | 2 | 2 | 0 |
| 14    | Design of Laterally Supported Simple Beams (ECOP)                                                                                                                                                 | 4 | 2 | 2 | 0 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                |   |   |   |   |

### 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 6                               | 5             | 5 %                              |
| 2   | Quiz 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Project                        | weekly                          | 20            | 20 %                             |
| 6   | Report                         | 13                              | 5             | 5 %                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                           |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning resources (books, scientific references, etc.) * | The main (essential) reference<br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Steel structures design, Prof. ABDELRAHIM KHALIL DESSOUKI, DAR ALMAARAF library, 12285, CAIRO, 2016.</li> <li>DESIGN AND ANALYSIS OF CONNECTIONS IN STEEL, ALFREDO BORAC, WILEY, 12286, GERMANY, 2018.</li> <li>DESIGN OF STEEL STRUCTURES TO EUROCODES, Loannis Vayas, SPRINGER, 12282, N.T.U., 2019</li> <li>STRUCTURAL STEEL WORK, SUDERSHAN KUMAR, VENUS BOOK, INDIA, 2023.</li> </ul>                                                                                                                                                                                                         |
|                                                           | Other References                                                                                             | <ul style="list-style-type: none"> <li>Behavior, Analysis And Design Of Steel Work V1,2 and 3, El-Sayed Bahaa Machaly, DAR ALKOTB, 8334, CAIRO, 2003.</li> <li>Egyptian Code Of Practice For Steel Construction And Bridges (Asd &amp; Lrfd), HOUSING AND BUILDING, DAR AL KOTB, 10321, CAIRO, 2001</li> <li>Steel Structures, Ch.G.Salam, S CHAND, 1229:1232, N.DELHI, 1980.</li> <li>Structural Steel Design, Abraham J.R., MCGRAW H., 1152, N.YORK, 1991.</li> <li>Structural Steel Design, Joseph E. Bowles, CONGRESS, 8390, LONDON, 1992.</li> <li>Egyptian Loading Code, HOUSING AND BUILDING, DAR AL KOTB, CAIRO, 2012.</li> </ul> |
|                                                           | Electronic Sources<br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://www.steel.org/">https://www.steel.org/</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                                                                          |                                                    |                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> |                                                    | <ul style="list-style-type: none"> <li><a href="https://www.sciencedirect.com/journal/journal-of-constructional-steel-research">https://www.sciencedirect.com/journal/journal-of-constructional-steel-research</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                        |
|                                                                          | <b>Devices/Instruments</b>                         | Data Show, White Board                                                                                                                                                                                                        |
|                                                                          | <b>Supplies</b>                                    | MS Team                                                                                                                                                                                                                       |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                            |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                            |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                            |
|                                                                          | <b>Other</b> (to be mentioned)                     | --                                                                                                                                                                                                                            |

|                  | <b>Course Coordinator</b>       | <b>Program Coordinator</b>       |
|------------------|---------------------------------|----------------------------------|
| <b>Name</b>      | <b>Dr. Mohammed Fathi Belal</b> | <b>Dr. Ghada Nashaat Mohamed</b> |
| <b>Signature</b> | M. Fathi Belal                  | غادة نشأت                        |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Irrigation and Drainage</b>            |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 155</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Water Resources, Meteorology, Hydrology, Application to Nile Projects, Modern Irrigation Systems. Basin and Perennial Systems of Irrigation. Drainage with Introduction to Underground water.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                              |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------|
| <b>A3, A4, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                              |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                  |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                                                         | The principles of irrigation Structures                                      |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Define old and modern irrigation techniques .                                |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO3</b>                                                         | Select ideas in determining the best irrigation system needed                |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                                                         | Identify irrigation and drainage project designed using different techniques |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            | √                     | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                      | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                          |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                                          |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction and Studying basic definitions on irrigation and drainage science- humid and arid regions.<br>Develop new problem sets and dedicate tutorial sessions to guided problem-solving activities. | 3                  | 2                                     | 0        | 1               |
| 2        | Studying the hydrological cycle- different hydraulic structures on water-ways.<br>The course examination committee will review and update the exam blueprint prior to the next semester.                 | 3                  | 2                                     | 0        | 1               |
| 3        | Studying kinds of soil water- movement of water into and within the soil                                                                                                                                 | 3                  | 2                                     | 0        | 1               |

|       |                                                                                                 |   |   |   |   |
|-------|-------------------------------------------------------------------------------------------------|---|---|---|---|
| 4     | Studying the soil water interaction and soil moisture characteristics-frequency of irrigation.. | 3 | 2 | 0 | 1 |
| 5     | Studying crops consumptive use of water                                                         | 3 | 2 | 0 | 1 |
| 6     | Irrigation efficiency.                                                                          | 3 | 2 | 0 | 1 |
| 7     | <b>Revision and Mid Exam</b>                                                                    |   |   |   |   |
| 8     | Introduction to irrigation methods.                                                             | 3 | 2 | 0 | 1 |
| 9     | Studying sprinkler method..                                                                     | 3 | 2 | 0 | 1 |
| 10    | Studying trickle Method.                                                                        | 3 | 2 | 0 | 1 |
| 11    | Projects to be solved using modern irrigation techniques.                                       | 3 | 2 | 0 | 1 |
| 12    | Introduction to land drainage                                                                   | 3 | 2 | 0 | 1 |
| 13    | Design on drainage systems                                                                      | 3 | 2 | 0 | 1 |
| 14    | Introduction to smart drainage system.                                                          | 3 | 2 | 0 | 1 |
| 15,16 | <b>Final Exam.</b>                                                                              |   |   |   |   |

### **Experiment Topics: (If any)**

| Serial | Experiment           |
|--------|----------------------|
| 1      | Pan evaporation test |
| 2      | Soil moisture test   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 11                              | 10            | 10 %                             |
| 2   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 3   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 4   | Assignments / Report           | Weekly                          | 25            | 25%                              |
| 5   | Final Practical                | 13                              | 5             | 5 %                              |

### **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• Water irrigation management and land developm, abhishek anand, venus book, 12374, India, 2023</li> <li>• Irrigation Engineering and Hydraulic, Dr. S.K.Sharma, S.Chand, 12171, NEW DELHI, 2016</li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | --                                                                                                                                                                                                                                                 |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>• WWW. Irrigation Structures.</li> </ul>                                                                                                                                                                    |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                             |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                             |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                                 |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                 |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                 |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                 |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                                 |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Monitoring &amp; Quality control systems</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MNG 101</b>                                  |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Mechanical Engineering</b>                   |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                              | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>1</b>                                        | <b>--</b>        | <b>--</b>              | <b>1</b>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                      |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                                   |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b>Mechanical Engineering</b>                   |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>           |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Dr.Radwa A. Ghazalla</b>                     |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department       |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | 8/12/2025                                       |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Introduction: history of quality, the dimensions of quality. Quality Control Concepts: quality assurance, total quality management. Control systems: objectives of control systems, quality systems, top management communication. Hazard Analysis: high -quality recommendations, commitment monitoring, follow up Systems, the base line of hazard analysis critical point (HACCP). Sampling and Inspection: Sample size, sampling error, sampling designs and inspection, acceptance sampling plans. Quality Control Tools and Techniques: tools for creating new concepts, tools for organization and analysis of data, tools for determining and solving problems (Control Charts for Variables - Control Charts for Attributes - PRE - control - analysis - flow charts). International Standards Accreditation: Accreditation meaning, ISO requirements and recommendations, Audit program, Certification body. Analyzing Process Capability:

Process capability indices, process performance indices.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                               | <b>Course Learning Outcomes</b>                                    |                                                                                                                       |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>A4, A8, A9</b>                                                                |                                                                                                                                                                               | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                       |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                   | <b>Code</b>                                                        | <b>Text</b>                                                                                                           |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles. | <b>LO1</b>                                                         | Apply appropriate statistical methods to evaluate operational or quality performance according to industry standards. |
| <b>A8</b>                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                                                          | <b>LO2</b>                                                         | Optimize the use of graphical data and visual tools to effectively communicate performance outcomes.                  |
| <b>A9</b>                                                                        | Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations                                 | <b>LO3</b>                                                         | Compare and evaluate different quality management systems to support continuous improvement and innovation.           |
|                                                                                  |                                                                                                                                                                               | <b>LO4</b>                                                         | Apply modern quality theories to optimize resource utilization and enhance organizational effectiveness.              |

### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |

|   |   |   |  |   |  |   |   |  |  |  |  |  |  |  |   |
|---|---|---|--|---|--|---|---|--|--|--|--|--|--|--|---|
| ✓ | ✓ | ✓ |  | ✓ |  | ✓ | ✓ |  |  |  |  |  |  |  | ✓ |
|---|---|---|--|---|--|---|---|--|--|--|--|--|--|--|---|

### **Course Schedule:**

| Week No. | Scientific content of the course<br>(Course Topics)             | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                 |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                 |                    |                                       | Tutorial | Lab / Practical |
| 1        | Introduction, Dimensions, Concepts, Objectives, Characteristics | 2                  | 1                                     | 1        |                 |
| 2        | Leaders of Quality                                              | 2                  | 1                                     | 1        |                 |
| 3        | Quality systems, Costs and measures, Quality assurance          | 2                  | 1                                     | 1        |                 |
| 4        | Quality Control Tools                                           | 2                  | 1                                     | 1        |                 |
| 5        | Total Quality Management                                        | 2                  | 1                                     | 1        |                 |
| 6        | Review                                                          | 2                  | 1                                     | 1        |                 |
| 7        | <b>Revision and Mid Exam</b>                                    |                    |                                       |          |                 |
| 8        | Hazard Analysis                                                 | 2                  | 1                                     | 1        |                 |
| 9        | Hazard Analysis                                                 | 2                  | 1                                     | 1        |                 |
| 10       | Sampling and Inspection                                         | 2                  | 1                                     | 1        |                 |
| 11       | Iso Definitions and tools                                       | 2                  | 1                                     | 1        |                 |
| 12       | Analyzing Process Capability                                    | 2                  | 1                                     | 1        |                 |
| 13       | Case study discussion and submission                            | 2                  | 1                                     | 1        |                 |
| 14       | Review and case study discussion                                | 2                  | 1                                     | 1        |                 |
| 15,16    | <b>Final Exam.</b>                                              |                    |                                       |          |                 |

| No. | Assessment Methods *                   | Assessment Timing<br>(Week Number) | Marks/<br>Scores | Percentage of<br>total course<br>Marks |
|-----|----------------------------------------|------------------------------------|------------------|----------------------------------------|
| 1   | Exam 1 written (Semester work or quiz) | 4                                  | 10               | 10%                                    |
| 2   | Exam 2 written (Semester work or quiz) | 12                                 | 10               | 10%                                    |
| 3   | Midterm exam                           | 7                                  | 20               | 20 %                                   |
| 4   | Final Written Exam                     | 15, 16                             | 40               | 40 %                                   |

|   |                                           |    |    |     |
|---|-------------------------------------------|----|----|-----|
| 5 | Case study                                | 13 | 10 | 10% |
| 6 | Assignments / Project /Portfolio/ Logbook | 9  | 10 | 10% |

### **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | Project Management: a systems approach to planning, scheduling, and controlling. Kerzner, Harold. (2020).                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Other References</b>                                                                                             | <b>Montgomery, D. C., "Introduction to Statistical Quality Control", 8th Edition, Wiley, 2020.</b>                                                                                                                                                                                                                                                                                                                                                            |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | MIT OpenCourseWare – Quality Control and Process Improvement<br><a href="https://ocw.mit.edu">https://ocw.mit.edu</a><br><b>ISO Official Website</b> (Standards & Certification) <a href="https://www.iso.org">https://www.iso.org</a><br>NIST – Process Capability & Quality Metrics <a href="https://www.nist.gov/services-resources/software/process-capability-analysis">https://www.nist.gov/services-resources/software/process-capability-analysis</a> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Supplies</b>                                                                                                     | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Electronic Programs</b>                                                                                          | MS-Teams                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b> |
|------------------|---------------------------|----------------------------|
| <b>Name</b>      | Dr. Radwa A. Ghazalla     | Dr. Mohamed Ashraf         |
| <b>Signature</b> | رضوى غزاله                | محمد اشرف                  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Field Training (2)</b>                 |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>FTR 161</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | --                                        | 18               |                        | 18           |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>JUNIOR</b>                             |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed abd Ellatief                    |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

The student shall be trained on how to execute reinforced concrete and concrete mix design on site; the use of different mixing methods, such as manual, mechanical. Understanding the technique of mix station. Also the student shall be trained to design and construct the shuttering for different concrete elements, and quantity surveying.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A9, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                                                               |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                                                                   |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Uses different materials and construction methods.                                                                                                                                                                            |
| <b>A9</b>                                                                        | Use creative innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Designs concrete mixes, using various methods                                                                                                                                                                                 |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                                                         | Applies a full range of civil engineering concepts and techniques through different construction methods.                                                                                                                     |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO4</b>                                                         | Distinguishes properties technology for construction analysis by construction methods, training on the student's exercise on the work of wooden formwork for the various structural elements and the inventory of quantities. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO5</b>                                                         | Practice calculating all quantities of materials used in construction                                                                                                                                                         |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
|                    |                      |                      |                        |            |                       | √                  |            | √              | √          |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                                                 | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                                                                     |                    |                                       | Tutorial | Practical / Lab |
| 1        | Ability of using different materials and construction methods.                                                                                                                                                                      | 18                 | --                                    | --       | 18              |
| 2        | Choose the creative solution for constructing structures with different surveying devices, training on how to implement buildings using reinforced concrete, designing concrete mixers, using different methods of concrete mixing. | 18                 | --                                    | --       | 18              |
| 3        | <b>Revision and Mid Exam</b>                                                                                                                                                                                                        |                    |                                       |          |                 |
| 4        | Applying a full range of civil engineering concept and techniques by construction methods, training on how to implement buildings using reinforced concrete, designing                                                              | 18                 | --                                    | --       | 18              |

|   |                                                              |    |    |    |    |
|---|--------------------------------------------------------------|----|----|----|----|
|   | concrete mixers, using different methods of concrete mixing. |    |    |    |    |
| 5 | Preparing and planning the site.                             | 18 | -- | -- | 18 |
| 6 | <b>Final Exam.</b>                                           |    |    |    |    |

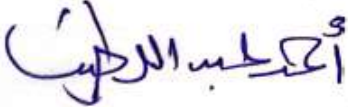
**5- Methods of students' assessment:**

| No. | Assessment Methods *              | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-----------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)    | --                              | --            | --                               |
| 2   | Exam 2 written (Semester work)    | --                              | --            | --                               |
| 3   | Midterm exam                      | <b>3</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 4   | Final Written Exam                | --                              | --            | --                               |
| 5   | Final Practical/Clinical/... Exam | --                              | --            | --                               |
| 6   | Final Oral Exam                   | <b>6</b>                        | <b>30</b>     | <b>30%</b>                       |
| 7   | Assignments / Report /Portfolio   | <b>5</b>                        | <b>25</b>     | <b>25 %</b>                      |
| 8   | Field training                    | <b>Weekly</b>                   | <b>25</b>     | <b>25%</b>                       |

**6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                        |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | • -----                |
|                                                                          | <b>Other References</b>                                                                                             | • -----                |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | • -----                |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          |                        |
|                                                                          | <b>Supplies</b>                                                                                                     |                        |
|                                                                          | <b>Electronic Programs</b>                                                                                          | <b>Auto cade</b>       |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       |                        |
|                                                                          | <b>Virtual Labs</b>                                                                                                 |                        |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      |                        |



|           | Course Coordinator                                                                | Program Coordinator                                                                |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Name      | Dr. Ahmed abd Ellatief                                                            | Dr. Ghada Nashaat Mohamed                                                          |
| Signature |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                                |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Properties and Testing of Materials (1)</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 114</b>                                 |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                             | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <u>2</u>                                       | <u>1</u>         |                        | <u>3</u>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                     |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                               |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                              |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>          |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Sherif H. AL-Tersawy                     |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department      |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                             |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Engineering materials and properties of materials, specifications, building stones, bricks, lime, strain gages, tension test, compression test, bending test, shear test, impact test, metallic materials.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                          | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                             |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A4, A10, B1</b>                                                           |                                                                                                                                                                                                                          | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                             |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                              | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                                 |
| <b>A2</b>                                                                        | <b>Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.</b> | <b>LO1</b>                                                         | <b>Characterize materials from both physical and mechanical points of view.</b>                                                                                                             |
|                                                                                  |                                                                                                                                                                                                                          | <b>LO2</b>                                                         | <b>Characterize the various types of testing machines according to usage and application.</b>                                                                                               |
|                                                                                  |                                                                                                                                                                                                                          | <b>LO3</b>                                                         | <b>Identify the different types of load, strain measures, and understand the methods of calibration made for testing machines.</b>                                                          |
|                                                                                  |                                                                                                                                                                                                                          | <b>LO4</b>                                                         | <b>Estimate the static properties of metals in tension, it's applications related to Civil work and calculation of mechanical properties of metals in tension test.</b>                     |
|                                                                                  |                                                                                                                                                                                                                          | <b>LO5</b>                                                         | <b>Estimate the static properties of materials in compression, its applications related to civil work and calculation of mechanical properties of metals in compression test.</b>           |
| <b>A4</b>                                                                        | <b>Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.</b>                                      | <b>LO6</b>                                                         | <b>Utilize codes to determine the static properties of materials in bending, its applications related to civil work and Calculation of mechanical properties of metals in bending test.</b> |
|                                                                                  |                                                                                                                                                                                                                          | <b>LO7</b>                                                         | <b>Utilize codes to determine the static properties of materials in shear, its applications related to civil work and calculation of mechanical properties of metals in shear test.</b>     |
|                                                                                  |                                                                                                                                                                                                                          | <b>LO8</b>                                                         | <b>Utilize codes to determine the static properties of metals in hardness, fatigue, and calculation of mechanical properties of metals in hardness, and fatigue tests.</b>                  |
| <b>A10</b>                                                                       | <b>Acquire and apply new knowledge; and practice</b>                                                                                                                                                                     | <b>LO9</b>                                                         | <b>Choose the suitable kind of testing machine and strain gauges according to the kind of test to be</b>                                                                                    |

|    |                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                                                                                                                                   |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|    | self, lifelong and other learning strategies.                                                                                                                                                                                                                                                                                                                                                               |      | performed, practice the calibration methods for testing machines and differentiate between instruments according to the sensitivity and accuracy. |
| B1 | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO10 | Compute the mechanical properties of metals and skills considering making charts and other schematic figures.                                     |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       | √                  | √          |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                 | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                     |                    |                                       | Tutorial | Practical / Lab |
| 1        | Types of materials, it's characteristics                                                                                                            | 3                  | 2                                     | 0        | 1               |
| 2        | Types of testing machines according to usage and application.<br><a href="#">Lab Quiz and Feedback</a>                                              | 3                  | 2                                     | 0        | 1               |
| 3        | Methods loads Application and measurement, strain measures, and methods of calibration of testing machines<br><a href="#">Lab Quiz and Feedback</a> | 3                  | 2                                     | 0        | 1               |
| 4        | Static properties of metals in tension<br><a href="#">Lab Quiz and Feedback</a>                                                                     | 3                  | 2                                     | 0        | 1               |
| 5        | Static properties of metals in tension + quiz 1                                                                                                     | 3                  | 2                                     | 0        | 1               |
| 6        | Static properties of metals in tension<br><a href="#">Lab Quiz and Feedback</a>                                                                     | 3                  | 2                                     | 0        | 1               |
| 7        | <b>Revision and Mid Exam</b>                                                                                                                        |                    |                                       |          |                 |
| 8        | Static properties of metals in Compression<br><a href="#">Lab Quiz and Feedback</a>                                                                 | 3                  | 2                                     | 0        | 1               |
| 9        | Static properties of metals in Bending<br><a href="#">Lab Quiz and Feedback</a>                                                                     | 3                  | 2                                     | 0        | 1               |
| 10       | Static properties of metals in Shear + quiz 2                                                                                                       | 3                  | 2                                     | 0        | 1               |
| 11       | Static properties of metals in Shear<br><a href="#">Lab Quiz and Feedback</a>                                                                       | 3                  | 2                                     | 0        | 1               |
| 12       | Hardness of metals<br><a href="#">Lab Quiz and Feedback</a>                                                                                         | 3                  | 2                                     | 0        | 1               |
| 13       | Fatigue of metals<br><a href="#">Lab Quiz and Feedback</a>                                                                                          | 3                  | 2                                     | 0        | 1               |
| 14       | Final Practical exam + oral exam.                                                                                                                   | 3                  | 2                                     | 0        | 1               |
| 15,16    | <b>Final Exam.</b>                                                                                                                                  |                    |                                       |          |                 |

### **Experiment Topics: (If any)**

| Serial | Experiment                         |
|--------|------------------------------------|
| 4th    | Tensile test in the laboratory     |
| 6th    | Compressive test in the laboratory |
| 9th    | Bending test in the laboratory     |
| 11th   | Sheare test in the laboratory      |
| 12th   | Hardness test in the laboratory    |

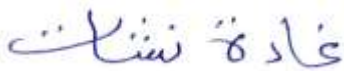
### 5- Methods of students' assessment:

| No. | Assessment Methods *                       | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | quiz 1 written (Semester work)             | 5                               | 10            | 10 %                             |
| 2   | quiz 2 written (Semester work)             | 10                              | 10            | 10%                              |
| 3   | Midterm exam                               | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                         | 15, 16                          | 40            | 40 %                             |
| 5   | Final Practical/Clinical/... Exam          | 14                              | 5             | 5%                               |
| 6   | Final Oral Exam                            | 14                              | 5             | 5%                               |
| 7   | Tutorial and report assessment (Term Work) | weekly                          | 10            | 10%                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li><b>R.S.KHURMI, „ Engineering Mechanics and Strength at Materials“, 5965, 2018</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li><b>Mechanical Behavior of Materials, Norman E. Dowling, International Edition</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://www.scribd.com/document/334600312/%D9%83%D8%AA%D8%A7%D8%A8-%D8%AE%D9%88%D8%A7%D8%B5-%D8%A7%D9%84%D9%85%D9%88%D8%A7%D8%AF-%D9%88%D8%A7%D8%AE%D8%AA%D8%A8%D8%A7%D8%B1%D8%A7%D8%AA%D9%87%D8%A7-%D8%A7%D9%84%D8%AC%D8%B2%D8%A1-%D8%A7%D9%84%D8%A7%D9%88%D9%84">https://www.scribd.com/document/334600312/%D9%83%D8%AA%D8%A7%D8%A8-%D8%AE%D9%88%D8%A7%D8%B5-%D8%A7%D9%84%D9%85%D9%88%D8%A7%D8%AF-%D9%88%D8%A7%D8%AE%D8%AA%D8%A8%D8%A7%D8%B1%D8%A7%D8%AA%D9%87%D8%A7-%D8%A7%D9%84%D8%AC%D8%B2%D8%A1-%D8%A7%D9%84%D8%A7%D9%88%D9%84</a> |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching</b>        | <b>Devices/Instruments</b>                                                                                          | <b>Compression testing machines- strain gages</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                  | <b>Supplies</b>                                                                                                     | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                  | <b>Electronic Programs</b>                                                                                          | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                  | <b>Skill Labs/ Simulators</b>                                                                                       | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                  | <b>Virtual Labs</b>                                                                                                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|                       |                                |   |
|-----------------------|--------------------------------|---|
| <b>and learning *</b> | <b>Other (to be mentioned)</b> | - |
|-----------------------|--------------------------------|---|

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | Prof. Sherif H. AL-Tersawy                                                        | Dr. Ghada Nashaat Mohamed                                                          |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Solid Mechanics</b>                    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>ENG 105</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Centroid. Area moment of inertia. Parallel axes theorem. Polar moment of inertia. Mass moment of inertia. Radius of gyration. Moment of inertia about inclined axes. Product of inertia about inclined axes. Principal axes of inertia (analytical & graphical). Loads, supports and reactions. Motion of Rigid Body, Newton's second law. Energy and momentum methods. Introduction to vibrations.



### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                            |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>A1, A2, A3</b>                                                                |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                            |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics                                                                                                                                                                                    | <b>LO1</b>                                                         | Describe engineering problems by applying engineering fundamentals and basic science of civil engineering. |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                  | <b>LO2</b>                                                         | Associate appropriate simulation and objective civil engineering judgment.                                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO3</b>                                                         | Classify data by applying civil engineering judgment.                                                      |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO4</b>                                                         | Interpret data and assess by using statical analyses to draw conclusions of structure elements.            |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO5</b>                                                         | Apply the design specification requirements to get the most economic cross-sections for floor beams.       |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       | √                  |            |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                                                                                  | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                   |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                                   |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction of center of gravity - center of mass and centroid.<br>Announce review session dates clearly in the course schedule. | 4                  | 2                                     | 2        | ---             |
| 2        | moment area Computing characteristics of composite area.<br>Standardized feedback templates for Teaching Assistants (TAs).        | 4                  | 2                                     | 2        | ----            |
| 3        | Introduction to parallel axes theorem<br>Develop structured presentation materials for case studies.                              | 4                  | 2                                     | 2        | ---             |
| 4        | Introduction to polar moment of area.<br>Coordinate with the IT department to ensure smooth software access.                      | 4                  | 2                                     | 2        | ---             |

|       |                                                                                         |   |   |   |      |
|-------|-----------------------------------------------------------------------------------------|---|---|---|------|
| 5     | Radius of gyration.                                                                     | 4 | 2 | 2 | ---  |
| 6     | Product moment of area                                                                  | 4 | 2 | 2 | ---  |
| 7     | <b>Revision and Mid Exam</b>                                                            |   |   |   |      |
| 8     | Moment area characteristics about inclined axes.                                        | 4 | 2 | 2 | ---  |
| 9     | Principal moment area characteristics                                                   | 4 | 2 | 2 | ---- |
| 10    | Loads – support and reaction.                                                           | 4 | 2 | 2 | ---- |
| 11    | Introduction of internal forces                                                         | 4 | 2 | 2 | ---  |
| 12    | Motion of rigid bodies                                                                  | 4 | 2 | 2 | ---- |
| 13    | Newton second law<br><a href="#">Upload the question bank to the MS Teams platform.</a> | 4 | 2 | 2 | ---  |
| 14    | Introduction to vibration characteristics                                               | 4 | 2 | 2 | ---  |
| 15,16 | <b>Final Exam.</b>                                                                      |   |   |   |      |

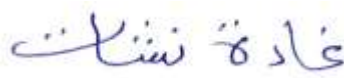
### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 6                               | 10            | 10 %                             |
| 2   | Quiz 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments                    | weekly                          | 20            | 20 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                   |                                                                                                                     |                                                                                                                          |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books,</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Theory of structures Vol. 1, El-Dakhakhni, Dar El-Maaref, Cairo - 2018</li> </ul> |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                              |
|--------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>scientific references, etc.) *</b>                                    |                                                    | <ul style="list-style-type: none"> <li>Engineering Mechanics – Hibbler – 2016 – New Jersey.</li> </ul>       |
|                                                                          | <b>Other References</b>                            | <ul style="list-style-type: none"> <li>Dynamics of structures – Patrick paultr – 2010 – Newdelhi.</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | -                                                                                                            |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                       |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board                                                                                       |
|                                                                          | <b>Supplies</b>                                    | --                                                                                                           |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                           |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                           |
|                                                                          | <b>Virtual Labs</b>                                |                                                                                                              |
|                                                                          | <b>Other (to be mentioned)</b>                     | --                                                                                                           |

|                  | <b>Course Coordinator</b>                                                          | <b>Program Coordinator</b>                                                           |
|------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Morcos Farid Samaan</b>                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |                 |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|-----------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Mathematics 3</b>                      |                  |                        |                 |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MTH 101</b>                            |                  |                        |                 |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |                 |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b>    |
|                                                                                                                 | <b><u>2</u></b>                           | <b><u>2</u></b>  |                        | <b><u>4</u></b> |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |                 |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |                 |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |                 |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |                 |
| <b>Name of Course Coordinator:</b>                                                                              | Dr/ Mahmoud Abu Zeid                      |                  |                        |                 |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |                 |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                  |                        |                 |

## 2. Course Overview (Brief summary of scientific content):

Cartesian – Cylindrical – Spherical Coordinates – Multi integral ( Double integral – Double integral in polar coordinates – Triple integral – Transformation between coordinates - Triple integral in cylindrical and spherical coordinates ) – Position vector – The dot product – Cross product and its applications – Infinite integrals in vector functions – Derivative of vector function – Gradient fields – Conservative vector field – Divergence and Curl of vector field – Line integral – Green theorem in the plane – Surface integral – Flux of vector field – Gauss divergence theorem – Stokes's theorem.

### **3. Course Learning Outcomes CLOs:**

**Matrix of course learning outcomes CLOs with program outcomes Pos (NARS/ARS).**

| <b>Program Outcomes (NARS/ARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                                    |
|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>(A1, A2, A3, A10)</b>                                                             |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                    |
| <b>Code</b>                                                                          | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                                        |
| <b>A1</b>                                                                            | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.                                                                                                                                                                                   | <b>LO1</b>                                                         | Define the main items of the vectors, lines and planes in space.                                                                   |
|                                                                                      |                                                                                                                                                                                                                                                                                                                     | <b>LO2</b>                                                         | Describe the main concepts of vectors and integral operations.                                                                     |
|                                                                                      |                                                                                                                                                                                                                                                                                                                     | <b>LO3</b>                                                         | Explain coordinate systems and the principals of Jacobian transformation and double and triple integrations and surfaces in space. |
| <b>A2</b>                                                                            | Develop and conduct appropriate and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                  | <b>LO4</b>                                                         | Analyze the Green, Gauss, and Stokes theorems to evaluate the applications.                                                        |
|                                                                                      |                                                                                                                                                                                                                                                                                                                     | <b>LO5</b>                                                         | Implement the skills of vectors to estimate some mathematical modeling.                                                            |
| <b>A3</b>                                                                            | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO6</b>                                                         | Analyze the life problem to create the mathematical problem.                                                                       |
|                                                                                      |                                                                                                                                                                                                                                                                                                                     | <b>LO7</b>                                                         | Classify the problems according to the suitable integral's method (line integral, surface integral and volume integral).           |
| <b>A10</b>                                                                           | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.                                                                                                                                                                                                                         | <b>LO8</b>                                                         | Describe and contrast between different lines and planes with sketching solids and planes                                          |
|                                                                                      |                                                                                                                                                                                                                                                                                                                     | <b>LO9</b>                                                         | Evaluate and assess the suitable method of the double and triple integrals in cylindrical and spherical coordinates.               |
|                                                                                      |                                                                                                                                                                                                                                                                                                                     | <b>LO10</b>                                                        | Manage time and apply the skills of Gradient field, divergence and curl of vector field.                                           |

### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                    | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|--------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial/Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                  | √                    |                        |            | √                     | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)      | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                          |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                          |                    |                                       | Tutorial | / Practical Lab |
| 1        | Vectors (The dot product- cross product- triple product) | 4                  | 2                                     | 2        | 0               |
| 2        | The lines in the space                                   | 4                  | 2                                     | 2        | 0               |
| 3        | The plane in the space                                   | 4                  | 2                                     | 2        | 0               |
| 4        | Surfaces in the space                                    | 4                  | 2                                     | 2        | 0               |
| 5        | Coordinates in different systems                         | 4                  | 2                                     | 2        | 0               |
| 6        | Multiple integrals (double and triple integral)          | 4                  | 2                                     | 2        | 0               |
| 7        | Revision and Mid Exam                                    |                    |                                       |          |                 |
| 8        | Triple integral in cylindrical and spherical coordinates | 4                  | 2                                     | 2        | 0               |
| 9        | Gradient field, divergence and curl of vector field      | 4                  | 2                                     | 2        | 0               |
| 10       | Line integral of scalar field                            | 4                  | 2                                     | 2        | 0               |
| 11       | Line integral of vector field                            | 4                  | 2                                     | 2        | 0               |

|       |                       |   |   |   |   |
|-------|-----------------------|---|---|---|---|
| 12    | <b>Green theorem</b>  | 4 | 2 | 2 | 0 |
| 13    | <b>Gauss theorem</b>  | 4 | 2 | 2 | 0 |
| 14    | <b>Stokes theorem</b> | 4 | 2 | 2 | 0 |
| 15,16 | <b>Final Exam.</b>    |   |   |   |   |

### 5- Methods of students' assessment:

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            | 4,5                             | 10            | 10%                              |
| 2   | Exam 2 written (Semester work)            | 10,11                           | 10            | 10%                              |
| 3   | Midterm exam                              | 7                               | 20            | 20%                              |
| 4   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 5   | Final Practical/Clinical/... Exam         |                                 | 0             |                                  |
| 6   | Final Oral Exam                           |                                 | 0             |                                  |
| 7   | Assignments / Project /Portfolio/ Logbook | 8,9                             | 20            | 20%                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | 1- Erwin Kreyszig, Advanced Engineering Mathematics, Tenth Edition, JOHN WILEY & SONS, INC.                                                                                                                                                                                                                                                                                                                                    |
|                                                                  | <b>Other References</b>                                                                                             | 1- Erwin Kreyszig, Advanced Engineering Mathematics<br>2- Advanced Calculus Theory and Practice, John Petrovic 2020<br>3- Advanced Calculus Fundamentals of Mathematics, Carlos Polanco<br>4- Advanced Engineering Mathematics by H. K. Dass.<br>5- Advanced Engineering Mathematics by K. A. Stroud and J. Booth, Fourth Edition.<br>6- Calculus III Jerald Marsden and Alan Weinstein, Springer-Verlag 1985, Second Edition. |



|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li>• <a href="https://math.fandom.com/wiki/Hypermathematics">https://math.fandom.com/wiki/Hypermathematics</a></li> <li>• <a href="https://github.com/AlexCharlton/hypermath">https://github.com/AlexCharlton/hypermath</a></li> <li>• <a href="https://www.britannica.com/science/mathematics">https://www.britannica.com/science/mathematics</a></li> <li>• <a href="https://www.khanacademy.org/math">https://www.khanacademy.org/math</a></li> <li>• <a href="https://animated-mathematics.net/">https://animated-mathematics.net/</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB- Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Supplies</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Electronic Programs</b>                         | <b>MATLAB</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Skill Labs/ Simulators</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Virtual Labs</b>                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Other (to be mentioned)</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

|                  |                            |                                                                                      |
|------------------|----------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>  | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Dr Mahmoud Abu Zeid</b> | Prof. Ahmed Abd El-Gafar                                                             |
| <b>Signature</b> | <i>Mahmoud Abu Zeid</i>    |  |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |      |             |        |                                                                 |
|----------------------------|------|-------------|--------|-----------------------------------------------------------------|
| تربية رياضية 2             |      |             |        | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| PHE 101                    |      |             |        | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |      |             |        | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| نظري                       | عملي | اخرى (تحدد) | إجمالي | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 2                          | 1    |             | 1      |                                                                 |
| اجباري                     |      |             |        | نوع المقرر:                                                     |
| SOPHOMORE                  |      |             |        | المستوى الدراسي الذي قدم فيه المقرر:                            |
| البرامج الهندسية           |      |             |        | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |      |             |        | المعهد:                                                         |
| د/عصماء علي                |      |             |        | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |      |             |        | جهة مناقشة واعتماد تقرير المقرر:                                |
| 7/26/2025                  |      |             |        | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

المقرر يحتوى علي قوانين الحركة . الميكانيكا الحيوية : انواع الروافع، قواعد الدفع، الاجهاد العضلي، التربية البدنية والمجهود البدني، نظم إنتاج الطاقة والمشروبات الرياضية، والظروف البيئية وتأثيرها على الأنشطة الرياضية.

## 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصنوفة في توصيف البرنامج) |                                                                                                                                     | نواتج التعلم للمقرر                            |                                                                                                 |
|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------|
| A2_A4_A5_A7_A8                                                                                          |                                                                                                                                     | عند الانتهاء من المقرر سيكون الطالب قادراً على |                                                                                                 |
| الكود                                                                                                   | النص                                                                                                                                | الكود                                          | النص                                                                                            |
| A2                                                                                                      | تحديد وصياغة وحل المشكلات الهندسية المعقدة من خلال تطبيق الأسس الهندسية والرياضيات والعلوم الأساسية                                 | LO1                                            | توظيف معارف ومهارات التربية الرياضية للتعامل مع إصابات                                          |
|                                                                                                         |                                                                                                                                     | LO2                                            | أهم الإصابات التي يتعرض لها اللاعبون والأفراد العاديين وأهم طرق العلاج                          |
| A4                                                                                                      | لاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر | LO3                                            | التعرف على أهم أسباب الانحرافات القوامية وتجنب حدوثها                                           |
|                                                                                                         |                                                                                                                                     | LO4                                            | شرح مفاهيم التربية والهندسة الرياضية ونظرياتها                                                  |
|                                                                                                         |                                                                                                                                     | LO5                                            | تنمية المعارف والمعلومات حول حقيقة ونطاق الإصابات الرياضية                                      |
| A5                                                                                                      | ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.                                                                        | LO6                                            | تنمية المعارف والمعلومات حول حقيقة ونطاق الإصابات الرياضية                                      |
|                                                                                                         |                                                                                                                                     | LO7                                            | التعرف على مبادئ الإسعافات الأولية والوسائل المستخدمة لإتجاه الإصابات الرياضية.                 |
| A7                                                                                                      | لعمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات                                                                        | LO8                                            | وتنمية المعارف والمعلومات حول الإصابات الرياضية التي يتعرض لها الرياضيين داخل الملاعب وخارجها . |
| A8                                                                                                      | التواصل بفعالية ببنائياً وشفاهه وكتابة مع مجموعات من الجماهير باستخدام الأدوات العصرية.                                             | LO9                                            | توظيف المعارف والمهارات التي حصل عليها في مجال العمل                                            |

#### 4 طرق التعليم والتعلم للمقرر:

| استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                   |                    |                           | التدريس الغير مباشر |               |                    |                  |                  |                         |             |                         | التدريس المباشر                      |              |                           |           |
|------------------------------------------------|-------------------|--------------------|---------------------------|---------------------|---------------|--------------------|------------------|------------------|-------------------------|-------------|-------------------------|--------------------------------------|--------------|---------------------------|-----------|
| النقاء الاصطناعي في التعليم                    | التعلم الإلكتروني | المعامل الافتراضية | برامج المحاكاة أو النمذجة | التعلم بالإكتشاف    | التعلم الذاتي | الزيارات الميدانية | التدريب الميداني | الحوار والمناقشة | كتابة التقارير /الأبحاث | حل المشكلات | استراتيجية دراسة الحالة | التعلم القائم على المشروعات الجماعية | العصف الذهني | التمارين العملية والتجارب | المحاضرات |
|                                                | ✓                 |                    |                           |                     | ✓             |                    |                  | ✓                | ✓                       |             |                         |                                      | ✓            | ✓                         | ✓         |

#### الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي | المحتوى العلمي للمقرر<br>(موضوعات المقرر)                                                               | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |       |
|---------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------|-------|
|                           |                                                                                                         |                                    | تدريس<br>نظري             | تدريب |
|                           |                                                                                                         |                                    |                           |       |
| 1                         | جسم الانسان ( عظمى - عضلى -<br>مفصلى - عصبى ) وما هو تأثير<br>ممارسات المشاركة الرياضية + نشاط<br>رياضي | 2                                  | 1                         | 0     |
| 2                         | تعريف الاصابة- اسبابها -اعراضها -<br>الاسعافات الاولية ومبادئها+ نشاط<br>رياضي                          | 2                                  | 1                         | 0     |
| 3                         | اهداف واعراض الاسعافات الاولية<br>والوسائل المستخدمة فى الاسعافات<br>الاولية + نشاط رياضي               | 2                                  | 1                         | 0     |
| 4                         | اصابات الجلد ( الجروح - الحروق -<br>كدمات الجلد ) + نشاط رياضي                                          | 2                                  | 1                         | 0     |
| 5                         | اصابات العضلات ( الاجهاد العضلى -<br>التقلص العضلى - التمزق العضلى ) +<br>نشاط رياضي                    | 2                                  | 1                         | 0     |
| 6                         | مراجعته عامه + تدريب على التقييم<br>العملي                                                              | 2                                  | 1                         | 0     |
| 7                         | مراجعة وامتحان منتصف الفصل الدراسي                                                                      |                                    |                           |       |
| 8                         | مراجعته عامه + مناقشه ابحاث                                                                             | 2                                  | 1                         | 0     |
| 9                         | اصابات الجهاز العصبي ( الاغماء-<br>الصدمة - كدمات الاعصاب -النزيف)<br>+ تقييم الجزء العملي              | 2                                  | 1                         | 0     |
| 10                        | ماهى القوام - تعريفه - مبادئ<br>المحافظة على القوام + مناقشه الابحاث<br>و التقارير                      | 2                                  | 1                         | 0     |
| 11                        | الانحرافات القوامية ( انواعها - اسبابها                                                                 | 2                                  | 1                         | 0     |
| 12                        | مراجعته عامه                                                                                            | 2                                  | 1                         | 0     |
| 13                        | إختبارات الفصل الدراسي النهائية عملي                                                                    |                                    |                           |       |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *              | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|----------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | بحث تقييمي للعملي          | 8_9                                               | 20            | 20%                                     |
| 2 | امتحان منتصف الفصل الدراسي | 7                                                 | 20            | 20%                                     |
| 3 | امتحان نهائي تحريري        | 14                                                | 30            | 30%                                     |
| 4 | امتحان نهائي عملي          | 13                                                | 30            | 30%                                     |

## 6- مصادر التعلم والتسهيلات المادية:

|                                                                         |                                                                                |                                                         |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------|
| مدخل في التربية الرياضية                                                | المرجع الأساسي للمقرر<br>(لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي) | مصادر التعلم<br>(الكتب والمراجع<br>العلمية وغيرها)<br>* |
| ابو العلا عبد الفتاح : الرياضه و انقاص الوزن ، دار الفكر<br>العربي 2023 | المراجع الأخرى                                                                 |                                                         |
| الهام شلبي : بانورما الصحة العامه للرياضيين القاهرة 2022                | المصادر الالكترونية<br>(لابد من إضافة الروابط)                                 |                                                         |
| EKB - Microsoft office                                                  | المنصة التعليمية<br>(لابد من إضافة الرابط)                                     |                                                         |
| قاعة محاضرات مجهزة والجيم                                               | 1                                                                              | التجهيزات<br>التعليمية<br>المساندة للتعليم<br>والتعلم * |
| المكتبات المركزية والفرعية                                              | 2                                                                              |                                                         |
| الوسائل التعليمية (داتا شو (جهاز كمبيوتر محمول).                        | 3                                                                              |                                                         |
| مذكرة لتدريس المقرر وكشوف متابعة للطلاب                                 | 4                                                                              |                                                         |

| منسق البرنامج                                                                       | منسق المقرر  |         |
|-------------------------------------------------------------------------------------|--------------|---------|
| د.د/ أحمد عبد الغفار                                                                | د. عصماء علي | الإسم   |
|  | عصماء علي    | التوقيع |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                             |      |             |        |                                                                 |
|-----------------------------|------|-------------|--------|-----------------------------------------------------------------|
| مبادئ هندسة التشييد والبناء |      |             |        | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| مدن 101                     |      |             |        | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| قسم الهندسة المدنية         |      |             |        | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| نظري                        | عملي | اخرى (تحدد) | إجمالي | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 2                           | 1    |             | 3      |                                                                 |
| اختياري                     |      |             |        | نوع المقرر:                                                     |
| SOPHOMORE                   |      |             |        | المستوى الدراسي الذي قدم فيه المقرر:                            |
| الهندسة المدنية             |      |             |        | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي    |      |             |        | المعهد:                                                         |
| أ.د / شريف الترساوى         |      |             |        | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج  |      |             |        | جهة مناقشة واعتماد تقرير المقرر:                                |
| مجلس القسم شهر أغسطس        |      |             |        | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

لمحة عن عملية البناء، الأحمال على المباني، مقاومة الأحمال، الخصائص الإنشائية للمواد، الأنظمة الإنشائية، الخصائص الحرارية للمواد، الخصائص المتعلقة بالحريق، مبادئ البناء المستدام. المواد وأنظمة البناء و المواد الإنشائية ، الجير، الأسمنت والخرسانة ، التربة؛ إنشاء الأساسات ، الأسقف، السلالم، أغطية الأرضيات.

### 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                            |                                                                                                 | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج) |                                                                                                                                        |
|------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على |                                                                                                 | (A1, A4, A9, A10)                                                                                       |                                                                                                                                        |
| الكود                                          | النص                                                                                            | الكود                                                                                                   | النص                                                                                                                                   |
| A1                                             | التعرف على أنواع المباني ومبادئ البناء المستدام وأنواع الرسومات المدنية والمعمارية.             | LO1                                                                                                     | تحديد وصياغة وحل المشكلات الهندسية المعقدة من خلال تطبيق أساسيات الهندسة والعلوم الأساسية والرياضيات                                   |
|                                                | التعرف على دور الأساسات السطحية والعميقة، وأساليب فحص التربة وتصريف المياه الجوفية.             | LO2                                                                                                     |                                                                                                                                        |
|                                                | وصف أنواع حديد التسليح وأنواع الأسمنت والخرسانة وأنواع تغطيات الأرضيات.                         | LO3                                                                                                     |                                                                                                                                        |
|                                                | دراسة أنواع البلاطات المختلفة، وحساب الأحمال المؤثرة عليها وسمكها                               | LO4                                                                                                     |                                                                                                                                        |
|                                                | التعرف على أنواع الطوب المختلفة وحساب الكميات المطلوبة للبناء.                                  | LO5                                                                                                     |                                                                                                                                        |
| A4                                             | تطبيق الأكود لاختيار نوع الأساس بناءً على الأحمال ونوع التربة، وتصميم وتنفيذ المنشآت الخرسانية. | LO6                                                                                                     | الاستفادة من التقنيات المعاصرة وقواعد الممارسة والمعايير وإرشادات الجودة ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر |
|                                                | تطبيق الإرشادات المعمارية في تصميم السلالم طبقاً للمواد والمساحات المتاحة.                      | LO7                                                                                                     |                                                                                                                                        |
| A9                                             | تخطيط الموقع وتجهيزه لأعمال التنفيذ ما في ذلك تنفيذ الشدات للعناصر الإنشائية و استلامها         | LO8                                                                                                     | استخدام التفكير الإبداعي والمبتكر والمرن واكتساب مهارات تنظيم المشاريع والقيادة لتوقع المواقف الجديدة والاستجابة لها                   |
| A10                                            | التعامل مع العطاءات والعقود والقضايا المالية للمشروعات                                          | LO9                                                                                                     | اكتساب وتطبيق المعرفة و التعلم الذاتي وغيرها من استراتيجيات التعلم                                                                     |

### 4 طرق التعليم والتعلم للمقرر:

| التدريس المباشر |                  | التدريس الغير مباشر |                                      |                         |             |                         |                  |                  |                    |               |                  | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |               |                             |
|-----------------|------------------|---------------------|--------------------------------------|-------------------------|-------------|-------------------------|------------------|------------------|--------------------|---------------|------------------|------------------------------------------------|--------------------|---------------|-----------------------------|
| المحاضرات       | التمارين العملية | المصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير /الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم بالإكتشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | ميكروسوفت تيم | الذكاء الاصطناعي في التعليم |
| ✓               | ✓                |                     |                                      |                         |             | ✓                       | ✓                |                  |                    |               |                  |                                                |                    | ✓             |                             |

## الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي | المحتوى العلمي للمقرر<br>(موضوعات المقرر)                                                                                                                  | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |                 |             |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------|-----------------|-------------|
|                           |                                                                                                                                                            |                                    | تدريس<br>نظري             | تدريب<br>تمارين | أخرى (تحدد) |
| 1                         | مقدمة                                                                                                                                                      | 3                                  | 2                         | 1               |             |
| 2                         | خطوات البناء والرسومات المدنية والمعمارية<br>والمواد الخرسانية<br>اعداد دليل تدريبي مصور يتناول أنواع الشدات<br>الحديثة وخصائصها الفنية.                   | 3                                  | 2                         | 1               |             |
| 3                         | حساب الكميات وأنواع الرسومات الهندسية                                                                                                                      | 3                                  | 2                         | 1               |             |
| 4                         | الغطاءات والتخطيط والإعداد للموقع<br>تنظيم ورش عمل تطبيقية داخل المعهد بالتعاون<br>مع شركات متخصصة في أنظمة الشدات.                                        | 3                                  | 2                         | 1               |             |
| 5                         | طرق فحص التربة، الأساسات (الأساسات<br>السطحية)                                                                                                             | 3                                  | 2                         | 1               |             |
| 6                         | أنواع الأساسات (الأساسات العميقة)                                                                                                                          | 3                                  | 2                         | 1               |             |
| 7                         | مراجعة وامتحان منتصف الفصل الدراسي                                                                                                                         |                                    |                           |                 |             |
| 8                         | التخلص من المياه الجوفية                                                                                                                                   | 3                                  | 2                         | 1               |             |
| 9                         | الشدات و إستلام الأساسات                                                                                                                                   | 3                                  | 2                         | 1               |             |
| 10                        | الشدات و إستلام الأعمدة                                                                                                                                    | 3                                  | 2                         | 1               |             |
| 11                        | الشدات و إستلام البلاطات                                                                                                                                   | 3                                  | 2                         | 1               |             |
| 12                        | نواع البلاطات وتوزيع الأحمال عليها وحساب<br>السمك                                                                                                          | 3                                  | 2                         | 1               |             |
| 13                        | أنواع الطوب وحساب كميات المواد للبناء<br>استخدام مشاريع حقيقية أو محاكاة رقمية<br>تحتوي على لوحات متعددة التخصصات يتم<br>تحليلها ومناقشتها داخل المحاضرات. | 3                                  | 2                         | 1               |             |
| 14                        | التصميم المعماري للسلالم                                                                                                                                   | 3                                  | 2                         | 1               |             |
| 16-15                     | إختبارات الفصل الدراسي النهائية                                                                                                                            |                                    |                           |                 |             |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *               | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|-----------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة) | 3                                                 | 10            | 10%                                     |
| 2 | امتحان 2 تحريري (أعمال سنة) | 12                                                | 10            | 10%                                     |
| 3 | امتحان منتصف الفصل الدراسي  | 7                                                 | 20            | 20%                                     |
| 4 | امتحان نهائي تحريري         | 15 و 16                                           | 40            | 40%                                     |
| 5 | تمارين و أبحاث              | إسبوعيا                                           | 20            | 20%                                     |



## 6- مصادر التعلم والتسهيلات المادية:

|                                                                                                                                                                                                                                                                                                   |                                                                                        |                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <p>-الكود المصري لميكانيكا التربة، اللجنة الدائمة للكود المصري، مركز بحوث الإسكان والبناء، القاهرة، 2024</p> <p>-الكود المصري لتصميم وتنفيذ المنشآت، اللجنة الدائمة للكود المصري، مركز بحوث الإسكان والبناء القاهرة، 2024</p>                                                                     | <p>المرجع الأساسي للمقرر<br/>(لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)</p> |                                                               |
| <p>-الموسوعة الحديثة في تكنولوجيا تشييد المباني 3م، فاروق عباس حيدر، منشأة المعارف، 2006</p> <p>-موسوعة التنفيذ المعماري والانشائي، حسين محمد جمعة، اللجنة الدائمة، القاهرة، 2005</p>                                                                                                             | <p>المراجع الأخرى</p>                                                                  | <p>مصادر التعلم<br/>(الكتب والمراجع العلمية وغيرها)<br/>*</p> |
| <p><a href="https://books-library.website/files/download-pdf-ebooks.org-1544385031Kk6O6.pdf">https://books-library.website/files/download-pdf-ebooks.org-1544385031Kk6O6.pdf</a></p> <p>-الملحق الثاني للكود المصري</p>                                                                           | <p>المصادر الالكترونية<br/>(لابد من إضافة الروابط)</p>                                 |                                                               |
| <p>EKB - Microsoft office</p> <p><a href="http://www.researchgate.net">www.researchgate.net</a></p> <p><a href="http://www.engineeringcivil.com">www.engineeringcivil.com</a></p> <p><a href="http://ocw.mit.edu/">http://ocw.mit.edu/</a></p> <p>Microsoft Teams   تشيد ترم الصيفي   General</p> | <p>المنصة التعليمية<br/>(لابد من إضافة الرابط)</p>                                     |                                                               |
| <p>سبورة بيضاء<br/>ب- جهاز عرض</p>                                                                                                                                                                                                                                                                | <p>الأجهزة</p>                                                                         | <p>التجهيزات التعليمية<br/>المساندة للتعليم والتعلم<br/>*</p> |

| منسق البرنامج     | منسق المقرر             |       |
|-------------------|-------------------------|-------|
| د. غادة نشأت محمد | أ.د/ شريف حسين الترساوى | الإسم |

|           |                                                                                    |         |
|-----------|------------------------------------------------------------------------------------|---------|
| غادة نشأت |  | التوقيع |
|-----------|------------------------------------------------------------------------------------|---------|

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Engineering Geology</b>                |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 111</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed Nabil                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Sources and processing for both natural and synthetic aggregates are needed for construction, minerals and rock types. Structural geology and influence of geological features on engineering works. Soil Formation, Physical properties; Hydraulic properties and permeability, Stress Distribution; Consolidation; Shear strength; Soil Exploration and Soil Testing.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Course Learning Outcomes</b>                                    |                                                                                                                             |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>A1, A2, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                             |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                | <b>Code</b>                                                        | <b>Text</b>                                                                                                                 |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.                                                                                                                                                                                                                                                                           | <b>LO1</b>                                                         | Discover all the information on the geology of the earth's crust from the engineering standpoint of view.                   |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, Analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                          | <b>LO2</b>                                                         | Conduct laboratory tests on different soil samples and evaluate the gained data to get The physical properties of the soil. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO3</b>                                                         | Relate the relation between the physical and mechanical properties of soil.                                                 |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics | <b>LO4</b>                                                         | Use the physical measurement to identify Stress distribution in soil mass under different types of surface loading.         |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO5</b>                                                         | Infer foundation settlement under the isolated footing.                                                                     |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO6</b>                                                         | Predict the relative compaction of soil using the results of the proctor test and sand cone test                            |

**4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       |                    |            |                |            |               |                    |                                          |              |            |                 |

### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                   | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                       |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                                       |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to soil formation<br>Pre-coordination with the laboratory department to prepare the required soil samples before the start of the semester.                                              | 3                  | 2                                     | --       | 1               |
| 2        | Index properties of soil as Water content, specific gravity.<br>Allocating part of the practical lectures to present these samples and discuss their physical and chemical properties.                | 3                  | 2                                     | --       | 1               |
| 3        | Index properties of soil as particle size distribution.<br>Encouraging students to directly interact with the samples through simple analytical activities (e.g., texture test or permeability test). | 3                  | 2                                     | --       | 1               |
| 4        | Consistency of soil, in. situ density, and examples.                                                                                                                                                  | 3                  | 2                                     | --       | 1               |

|       |                                                                                                                                                                                                                                      |   |   |    |   |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|---|
| 5     | Preliminary definitions and relations of soil like the phase definitions, functional and examples.<br>Dedicating one or more lectures to introduce the basics of using the software, including its interface and key analysis tools. | 3 | 2 | -- | 1 |
| 6     | Continuing of topic in week-5                                                                                                                                                                                                        | 3 | 2 | -- | 1 |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                                                         |   |   |    |   |
| 8     | Types of water in soil and examples                                                                                                                                                                                                  | 3 | 2 | -- | 1 |
| 9     | Stresses in soil.<br><br>Providing short tutorial videos or links to external resources to help students get hands-on familiarity with the software.                                                                                 | 3 | 2 | -- | 1 |
| 10    | Stresses due to concentrated load. Stresses due to line load, vertical stresses under uniformly loaded circular area.                                                                                                                | 3 | 2 | -- | 1 |
| 11    | Consolidation of soil: compression characteristics, coefficient of compressibility, coefficient of volume change, the relation $e$ -log, Terzaghi's theory of consolidation, consolidation test, consolidation settlement            | 3 | 2 | -- | 1 |
| 12    | Continuing of topic in week-11                                                                                                                                                                                                       | 3 | 2 | -- | 1 |
| 13    | Soil Compaction: Definition, Factors affecting soil compaction,                                                                                                                                                                      | 3 | 2 | -- | 1 |
| 14    | Proctor test, Modified Proctor test.                                                                                                                                                                                                 | 3 | 2 | -- | 1 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                                                   |   |   |    |   |

**Experiment Topics: (If any)**

| Serial | Experiment                      |
|--------|---------------------------------|
| 1      | Sieve Analysis                  |
| 2      | Water content- specific gravity |
| 3      | Relative density                |
| 4      | Liquid limit-plastic limit      |
| 5      | Odometer test                   |
| 6      | Proctor test                    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 6                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 10                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Final Practical                | 14                              | 10            | 10 %                             |
| 6   | Final Oral Exam                |                                 | 0             |                                  |
| 7   | Assignments / Project          | weekly                          | 10            | 10 %                             |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                   |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• BERNARDO CAICEDO “GEOTECHNICS OF ROADS FUNDAMENTALS”, CRC PRESS, 12159, LONDON, 2019</li> <li>• SOIL MECHANICS THROUGH PROJECT, IVAN GRATCHEV, CRC PRESS, 12170, LONDON, 2019</li> </ul> |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Amer Radwan. "A course in Soil; Mechanics", Dar El-Maarif, 2007</li> </ul>                                                                                                               |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                            |
| <b>Supportive facilities &amp; equipment</b>                     | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                            |
|                                                                  | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                |
|                                                                  | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                |

|                                                |                                |    |
|------------------------------------------------|--------------------------------|----|
| <b>for<br/>teaching<br/>and<br/>learning *</b> | <b>Skill Labs/ Simulators</b>  | -- |
|                                                | <b>Virtual Labs</b>            | -- |
|                                                | <b>Other (to be mentioned)</b> | -- |

|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Ahmed Nabil</b>                                                            | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Surveying (1)</b>                      |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 112</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Dr. Amr Nada</b>                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Introduction to surveying. Different Types of Scales. Mapping Using Linear Measurements. Compass Surveying and Traverse Computations Area Determination. Levelling: instrumentation, method of calculation, cross and longitudinal sections, contouring earth work.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes Pos (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | Course Learning Outcomes                                    |                                                                                                                      |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| (A1, A2, A6, and B1)                                                      |                                                                                                                                                                                                                                                                                                                                                                                                             | Upon completion of the course, the student will be able to: |                                                                                                                      |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                        | Code                                                        | Text                                                                                                                 |
| A1                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.                                                                                                                                                                                                                                                                            | LO1                                                         | Knowledge of mapping , units, scales and create the scale of mapping.                                                |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO2                                                         | Provide the student how to draw scale, linear and area measurement                                                   |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO3                                                         | Knowledge of measurements, compass, area of cross-section and calculation of linear measurements, horizontal angles. |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | LO4                                                         | Training the student how to measuring horizontal vertical angles and calculation of area of different sections.      |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | LO5                                                         | Definition of bearing using compass.                                                                                 |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO6                                                         | Knowledge of traversing computation, omitted observation and calculation of traverse computations.                   |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO7                                                         | Knowledge of leveling, contour lines, cross-section and volume of earthwork.                                         |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO8                                                         | Transform sets of constraints and requirements into useful quantities representations.                               |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO9                                                         | Provide the students with the use of ICT programs to solve problems.                                                 |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      |            | √                     | √                  | √          |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                  | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                      |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                      |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to surveying, mapping using linear measurement.                         | 4                  | 2                                     | 0        | 2               |
| 2        | Different type of scale.                                                             | 4                  | 2                                     | 0        | 2               |
| 3        | Compass surveying Prismatic and surveying compass, true and magnetic north, bearing. | 4                  | 2                                     | 0        | 2               |
| 4        | Compass surveying Prismatic and surveying compass, true and magnetic north, bearing. | 4                  | 2                                     | 0        | 2               |
| 5        | Local attraction.                                                                    | 4                  | 2                                     | 0        | 2               |
| 6        | Traverse computation.                                                                | 4                  | 2                                     | 0        | 2               |

|       |                                                                                                                                   |   |   |   |   |
|-------|-----------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 7     | <b>Revision and Mid Exam</b>                                                                                                      |   |   |   |   |
| 8     | Traverse computation.                                                                                                             | 4 | 2 | 0 | 2 |
| 9     | Area determination.                                                                                                               | 4 | 2 | 0 | 2 |
| 10    | Leveling: Type of level, Basic principle of the level and its parts.                                                              | 4 | 2 | 0 | 2 |
| 11    | Instrument height, Rise and Fall method.<br><a href="#">Field Training Project on Leveling, Excavation, and Backfilling Works</a> | 4 | 2 | 0 | 2 |
| 12    | Contour map.                                                                                                                      | 4 | 2 | 0 | 2 |
| 13    | Vertical Section: Profile and Cross-section.                                                                                      | 4 | 2 | 0 | 2 |
| 14    | Final Practical exam.                                                                                                             | 4 | 2 | 0 | 2 |
| 15,16 | <b>Final Exam.</b>                                                                                                                |   |   |   |   |

### **Experiment Topics: (If any)**

| Serial | Experiment                                                        |
|--------|-------------------------------------------------------------------|
| 1      | Plan the student in how to use tools and tape.                    |
| 2      | Plan the student in how to use compass.                           |
| 3      | Plan the student in how to use level.                             |
| 4      | Plan the student in how to calculate level for different point.   |
| 5      | Training the student in how to measure angle by level instrument. |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 5                               | 5             | 5 %                              |
| 2   | Quiz 2 written (Semester work) | 11                              | 5             | 5 %                              |
| 3   | Midterm exam                   | 7                               | 30            | 30 %                             |
| 4   | Final Written Exam             | 15, 16                          | 30            | 30 %                             |
| 5   | Final Practical Exam           | 14                              | 10            | 10 %                             |

|   |                                     |                       |    |      |
|---|-------------------------------------|-----------------------|----|------|
| 6 | Assignments / Project / (Term work) | According to schedule | 20 | 20 % |
|---|-------------------------------------|-----------------------|----|------|

### **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | - Duggal, S.K., "Surveying", Volume 2, ISBN-10: 9353167523, MC Graw Hill India, <b>2018</b> .                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Other References</b>                                                                                             | - Bannister, A., Raymond, S. and Baker, R., "Surveying", 6 <sup>th</sup> Edition, ISBN 10: 0582302498, Prentice Hall, 1998.<br><br>- Dr. B. C. Punmia, Ashok, K. J., Arun, K. J.   Laxmi "Surveying Volume 2, 8 <sup>th</sup> Edition, National Institute of Technology Goa Farmagudi, Ponda, Goa – 403 401, 2018.<br><br>- A., M., Chandra, "Plane Surveying", New Age International Publishers, 2 <sup>nd</sup> Edition, 2007. |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://archive.org/details/surveying0000bann_i6o6">https://archive.org/details/surveying0000bann_i6o6</a>                                                                                                                                                                                                                                                                                                              |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB – Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Surveying laboratory: Compass and Levelling                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | <b>Supplies</b>                                                                                                     | Data show                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                               |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Dr. Amr Nada</b>                                                                 | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Civil Engineering Drawing (1)</b>      |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 113</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 |                                           | 4                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Sherif H. AL-Tersawy                |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Structural details drawing for columns and bases, trusses, built up sections, joints, concrete structures, reinforcement details.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                 | Course Learning Outcomes                                    |                                                                                                             |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| A5, A7, A8, A10, B2                                                       |                                                                                                                                                                                                                                                                                                                                                                 | Upon completion of the course, the student will be able to: |                                                                                                             |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                            | Code                                                        | Text                                                                                                        |
| A8                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                                                                                                                                                                                                                                            | LO1                                                         | connect between types of steel cross sections.                                                              |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                 | LO2                                                         | contact projections of steel connection.                                                                    |
| A10                                                                       | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies                                                                                                                                                                                                                                                                      | LO3                                                         | Employ the ability to distinguish between architecture and structural drawings.                             |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                 | LO4                                                         | Adapt the structural details drawing of engineering projects with drawings using AutoCAD program.           |
| A5                                                                        | Practice design techniques and methods of investigation as an inherent part of learning                                                                                                                                                                                                                                                                         | LO5                                                         | Process the structural details drawing of engineering projects                                              |
| A7                                                                        | Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.                                                                                                                                                                                                                                                           | LO6                                                         | Work the steel connections details as well as RC reinforcement details to chime with different applications |
| B2                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline. | LO7                                                         | Choose the computer aided drawing software (AutoCAD) for structural drawing.                                |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                 | LO8                                                         | Produce design drawing necessary for cost estimation.                                                       |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       | √                  |            |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                           | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                               |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                               |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction for Structural drawing for Steel construction projects.<br><a href="#">Basics of Reading Structural Drawings</a> | 4                  | 0                                     | 0        | 4               |
| 2        | Steel Structure: cross-sections<br><a href="#">Analysis of Advanced Structural Drawings</a>                                   | 4                  | 0                                     | 0        | 4               |
| 3        | Steel Structure: beam to beam connections<br><a href="#">Manual Practice in Structural Detailing</a>                          | 4                  | 0                                     | 0        | 4               |
| 4        | Steel Structure: beam to column connections                                                                                   | 4                  | 0                                     | 0        | 4               |
| 5        | Steel Structure: beam to column connections + quiz 1                                                                          | 4                  | 0                                     | 0        | 4               |



|    |                                                                                                                           |   |   |   |   |
|----|---------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|    | Structural Detailing Using AutoCAD                                                                                        |   |   |   |   |
| 6  | Steel Structure: base connections using auto CAD program                                                                  | 4 | 0 | 0 | 4 |
| 7  | <b>Revision and Mid Exam</b>                                                                                              |   |   |   |   |
| 8  | Steel Structure: base connections using auto CAD program                                                                  | 4 | 0 | 0 | 4 |
| 9  | Introduction for Structural drawing for RC construction projects architecture and structural plans using auto CAD program | 4 | 0 | 0 | 4 |
| 10 | RC structure: Beams and RFT details+ quiz 2                                                                               | 4 | 0 | 0 | 4 |
| 11 | RC structure: Beams and RFT details using auto CAD program                                                                | 4 | 0 | 0 | 4 |
| 12 | RC structure: Base and RFT details using auto CAD program                                                                 | 4 | 0 | 0 | 4 |
| 13 | RC structure: Columns and RFT details using auto CAD program                                                              | 4 | 0 | 0 | 4 |
| 14 | <b>Final Exam.</b>                                                                                                        |   |   |   |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *                                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-----------------------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | quiz 1 written (Semester work)                            | 10                              | 10            | 10%                              |
| 2   | Midterm exam                                              | 7                               | 30            | 30 %                             |
| 3   | Final Written Exam                                        | 14                              | 30            | 30 %                             |
| 5   | Tutorial, Class work and home work assessment (Term Work) | weekly                          | 30            | 30%                              |

### **6- Learning Resources and Supportive Facilities \***

|                                              |                                                                                                                     |                                                                                                                                                               |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>AutoCAD Practice Drawings: "CAD Drawings and Projects with Dimensions for Practice" Jaiprakash Pandey; 2018</li> </ul> |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                    |
|--------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>references, etc.) *</b>                                               |                                                    | <ul style="list-style-type: none"> <li>• “Introduction to AutoCAD 2021 for Civil Engineering Applications”; Nighat Yasmin; 2021</li> </ul>                         |
|                                                                          | <b>Other References</b>                            | الكود المصري للتفاصيل الإنشائية (الملحق الثاني).                                                                                                                   |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://www.autodesk.com/10.4">AutoCad Official Site;</a><br><a href="https://www.autodesk.com/10.4">https://www.autodesk.com/10.4.</a> <b>Web Sites:</b> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                             |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | <b>Data show - Computers Lab</b>                                                                                                                                   |
|                                                                          | <b>Supplies</b>                                    | -                                                                                                                                                                  |
|                                                                          | <b>Electronic Programs</b>                         | <b>AutoCad program</b>                                                                                                                                             |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | -                                                                                                                                                                  |
|                                                                          | <b>Virtual Labs</b>                                | -                                                                                                                                                                  |
|                                                                          | <b>Other (to be mentioned)</b>                     | -                                                                                                                                                                  |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Prof. Sherif H. AL-Tersawy</b>                                                   | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Theory of Structures (1)</b>           |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 124</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Stress, strain, Hook's law. Modulus of elasticity, modulus of rigidity and Poisson's ratio. Statically determination of axial force, shear force, bending moment and torque in bars, beams and circular shafts. Load-shear-moment relationship in beams. Section Kinematics; strain and stress distribution and their resultants. Normal and shear stress distributions in beams of different shapes. Transformation of stress and strain, Mohr's circle. Spherical and cylindrical pressure vessels. Elastic buckling of columns.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Course Learning Outcomes</b>                                    |                                                                                                            |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>A1, A2, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                            |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                | <b>Code</b>                                                        | <b>Text</b>                                                                                                |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.                                                                                                                                                                                                                                                                          | <b>LO1</b>                                                         | Describe structural problems by applying engineering fundamentals for loads, members, and supports.        |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                         | <b>LO2</b>                                                         | Apply structural model simulation.                                                                         |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO3</b>                                                         | Classify supports to identify reaction types.                                                              |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO4</b>                                                         | Interpret equilibrium equations to obtain reactions, and assess the results by using check equation.       |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics | <b>LO5</b>                                                         | Discover appropriate technique to develop infinitesimal prism out of model.                                |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO6</b>                                                         | Apply structural principles to obtain stress components.                                                   |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO7</b>                                                         | Distinguish appropriate transformation method to seek maximum stresses either analytically or graphically. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        |            | √                     |                    | √          |                |            |               |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                  | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                      |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                      |                    |                                       | Tutorial | Practical / Lab |
| 1        | Identify Stress, strain, Hook's law. Modulus of elasticity, modulus of rigidity and Poisson's ratio. | 4                  | 2                                     | 2        | ---             |
| 2        | Kinds of loads, supports, and reaction                                                               | 4                  | 2                                     | 2        | ---             |
| 3        | Determination of normal forces at structural element any section of                                  | 4                  | 2                                     | 2        | ---             |
| 4        | Determination of shear forces at any section of structural element.                                  | 4                  | 2                                     | 2        | ---             |
| 5        | Determination of bending moments at any section of structural element.                               | 4                  | 2                                     | 2        | ---             |
| 6        | Load-shear-moment relationship in beams.                                                             | 4                  | 2                                     | 2        | ---             |
| 7        | Revision and Mid Exam                                                                                |                    |                                       |          |                 |

|       |                                                                          |   |   |   |     |
|-------|--------------------------------------------------------------------------|---|---|---|-----|
| 8     | Strain and stress distribution and their resultants.                     | 4 | 2 | 2 | --- |
| 9     | Normal stress distribution in beams of different shapes.                 | 4 | 2 | 2 | --- |
| 10    | Special cases of Normal stress distribution in beams.                    | 4 | 2 | 2 | --- |
| 11    | shear stress distribution in beams of different shapes                   | 4 | 2 | 2 | --- |
| 12    | Special cases of shear stress distribution in beams.                     | 4 | 2 | 2 | --- |
| 13    | Transformation of stress and strain, Mohr's circle                       | 4 | 2 | 2 | --- |
| 14    | Spherical and cylindrical pressure vessels. Elastic buckling of columns. | 4 | 2 | 2 | --- |
| 15,16 | <b>Final Exam.</b>                                                       |   |   |   |     |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing<br>(Week Number) | Marks/<br>Scores | Percentage<br>of<br>total course<br>Marks |
|-----|--------------------------------|------------------------------------|------------------|-------------------------------------------|
| 1   | Exam 1 written (Semester work) | <b>4</b>                           | <b>5</b>         | <b>5%</b>                                 |
| 2   | Exam 2 written (Semester work) | <b>11</b>                          | <b>5</b>         | <b>5%</b>                                 |
| 3   | Midterm exam                   | <b>7</b>                           | <b>20</b>        | <b>20%</b>                                |
| 4   | Final Written Exam             | <b>15, 16</b>                      | <b>40</b>        | <b>40 %</b>                               |
| 6   | Course work                    | <b>Every Week</b>                  | <b>15</b>        | <b>15%</b>                                |
| 7   | Assignments                    | <b>Periodically</b>                | <b>15</b>        | <b>15%</b>                                |

#### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <b>Kassimali, A. (2020). <i>Structural Analysis</i> (6th ed.). Boston, MA: Cengage Learning, 12313</b><br><br><b>Dadeppo, D. A. (2004). <i>Introduction to Structural Mechanics and Analysis</i>. Englewood Cliffs, NJ: Prentice Hall., JOHN WILEY, 10124</b> |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                               |
|--------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|                                                                          | <b>Other References</b>                            | <b>Lecture notes, PDF</b>                                                                                     |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://courses.structure.education/collections">https://courses.structure.education/collections</a> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | Microsoft office                                                                                              |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         |                                                                                                               |
|                                                                          | <b>Supplies</b>                                    | --                                                                                                            |
|                                                                          | <b>Electronic Programs</b>                         | <b>Microsoft Teams</b>                                                                                        |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                            |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                            |
|                                                                          | <b>Other (to be mentioned)</b>                     | --                                                                                                            |

|                  |                                                                                    |                                                                                     |
|------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                          | <b>Program Coordinator</b>                                                          |
| <b>Name</b>      | <b>Ass. Prof. Morcos Farid Samaan</b>                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                    |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                             |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Principles of engineering electrical</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>EEC 101</b>                              |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Electrical Engineering</b>               |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                          | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                    | <b>1</b>         |                        | <b>3</b>     |
| <b>Course Type:</b>                                                                                             | Elective                                    |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                            |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>      |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>       |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr.Eslam Mansour                            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department   |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>8/11/2025</b>                            |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Basic Concepts: Voltage, current, power, and energy, Independent and dependent voltage and current sources. DC Circuits Analysis: Ohms law, Kirchhoff's current and voltage laws. Series and parallel DC circuit's analysis, nodal analysis, and mesh analysis. Superposition, source transformation, and maximum power transfer theorems, Thevenin's and Norton's theorems. Capacitance and Inductance: series and parallel connections of capacitors and inductors. AC Circuits Analysis: Sinusoidal sources, r. m. s. value, phasor representation, complex impedances, Kirchhoff's laws in the phasor domain, parallel and series AC circuits. Experiments will be conducted to support the course including the use of computer software for circuit analysis.



### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                      | Course Learning Outcomes                                    |                                                                                                 |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| (A1, A2, A3)                                                              |                                                                                                                                                                                                                                                                                                                      | Upon completion of the course, the student will be able to: |                                                                                                 |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                 | Code                                                        | Text                                                                                            |
| A1                                                                        | A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.                                                                                                                                                                                | L0.1                                                        | Calculate the voltage difference and current intensity through any device in a complex circuit. |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | L0.2                                                        | Ability to use Spice simulator to calculate the current and voltage drop through any element.   |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | L0.3                                                        | Determine the optimal load of a two-terminal circuit (that absorbs the maximum power).          |
|                                                                           |                                                                                                                                                                                                                                                                                                                      | L0.4                                                        | Choose the suitable load for a predefined phase shift between the AC voltage and current.       |
|                                                                           |                                                                                                                                                                                                                                                                                                                      | L0.5                                                        | Check the ability of a circuit component to be connected in a circuit without be overheated.    |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | ✓                    | ✓                      |            | ✓                     | ✓                  | ✓          |                |            | ✓             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                          | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                              |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                              |                    |                                       | Tutorial | / Practical Lab |
| 1        | Basic Concepts: Voltage, current, power, and energy, Independent and dependent voltage, and current sources. | 3                  | 2                                     | 1        |                 |
| 2        | Ohms law, Kirchhoff's current and voltage laws. Series and parallel DC circuit's analysis.                   | 3                  | 2                                     | 1        |                 |
| 3        | Nodal analysis, and mesh analysis.                                                                           | 3                  | 2                                     | 1        |                 |
| 4        | Superposition, and source transformation.                                                                    | 3                  | 2                                     | 1        |                 |
| 5        | Maximum power transfer theorems, Thevenin's and Norton's theorems.                                           | 3                  | 2                                     | 1        |                 |
| 6        | Capacitance and Inductance: series and parallel connections of capacitors and inductors.                     | 3                  | 2                                     | 1        |                 |
| 7        | Revision and Mid Exam                                                                                        |                    |                                       |          |                 |

|       |                                            |   |   |   |  |
|-------|--------------------------------------------|---|---|---|--|
| 8     | Phasor representation, complex impedances. | 3 | 2 | 1 |  |
| 9     | Kirchhoff's laws in the phasor domain.     | 3 | 2 | 1 |  |
| 10    | Parallel and series AC circuits.           | 3 | 2 | 1 |  |
| 11    | Parallel and series AC circuits.           | 3 | 2 | 1 |  |
| 12    | Parallel and series AC circuits.           | 3 | 2 | 1 |  |
| 13    | Parallel and series AC circuits.           | 3 | 2 | 1 |  |
| 14    | General Revision.                          | 3 | 2 | 1 |  |
| 15,16 | <b>Final Exam.</b>                         |   |   |   |  |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *                              | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|---------------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Final Exam ( <i>written</i> )                     | 15th                            | <b>40</b>     | <b>40 %</b>                      |
| 2   | Midterm written Exam ( <i>Term Work</i> )         | 7th                             | <b>20</b>     | <b>20 %</b>                      |
| 5   | Quizzes/reports/presentation ( <i>Term Work</i> ) | 6th & 11th/ during the semester | <b>40</b>     | <b>40 %</b>                      |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                   |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | Electric Circuits", James W. Nilsson, Susan Riedel, Eleventh edition, Global Edition-Pearson 2019                 |
|                                                                  | <b>Other References</b>                                                                                             | Fundamentals of electric circuits", Charles K. Alexander, Matthew N. O. Sadiku, fifth edition, McGRAW-HILL, 2013. |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  |                                                                                                                   |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                            |
|                                                                  |                                                                                                                     |                                                                                                                   |

|                                                                          |                               |                                              |
|--------------------------------------------------------------------------|-------------------------------|----------------------------------------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Supplies</b>               | White board, Projector and Microsoft teams . |
|                                                                          | <b>Skill Labs/ Simulators</b> |                                              |

|                  |                           |                             |
|------------------|---------------------------|-----------------------------|
|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b>  |
| <b>Name</b>      | Dr. Eslam Mansour         | Ass.Prof.Dr. Taghreed Saied |
| <b>Signature</b> | <i>eslam mansour</i>      | <i>taghreed said</i>        |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Arts and Architecture</b>              |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>ARE 101</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Architectural Engineering</b>          |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  | <b>1</b>         |                        | <b>3</b>     |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Assoc. Prof. Sahar Ezz El Arab Ramadan    |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>8/10/2025</b>                          |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

History of fine arts (ornamental - sculpture - drawing.....) Art movements in the twentieth century: cubism, expressionism, surrealism, art collections such as De Steele and Bauhaus and their new ideas on the interconnectedness of arts, architecture, design, art education and art trends across historical times and architectural and parallel trends, contemporary artistic trends and their effects on architecture, structural values in artwork (contrast, balance, color, rhythm, movement.....) Artistic metrics and design foundations in architecture

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                              | Course Learning Outcomes                                    |                                                                                                         |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| A1, A5, A9, A10                                                           |                                                                                                                                                                              | Upon completion of the course, the student will be able to: |                                                                                                         |
| Code                                                                      | Text                                                                                                                                                                         | Code                                                        | Text                                                                                                    |
| A1                                                                        | Identify, formulate, and solve complex engineering problems by applying basic science and mathematics engineering fundamentals.                                              | LO1                                                         | Identify art and architecture with their concepts throughout the ages                                   |
|                                                                           |                                                                                                                                                                              | LO2                                                         | Solve complex problems in art forms in buildings.                                                       |
| A5                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                   | LO3                                                         | Practice research techniques in painting-sculpture-photography-interior design related to architecture. |
| A9                                                                        | Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner. | LO4                                                         | Express effectively with audiences by different techniques of art direction in various buildings.       |
| A10                                                                       | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies                                                                                   | LO5                                                         | Apply new knowledge from various art schools of architecture and arts.                                  |
|                                                                           |                                                                                                                                                                              | LO6                                                         | Practice design ideas by special application of art forms in different architectural styles.            |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      |            | √                     | √                  | √          |                |            | √             | √                  |                                          |              | √          |                 |

## Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                               | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                   |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                   |                    |                                       | Tutorial | Lab / Practical |
| 1        | Trends of art and architecture across different historical eras.                                                  | 3                  | 2                                     | 1        | 0               |
| 2        | Fine Arts (Sculpture - Drawing - Photography - Interior Design.....) Its relationship to architecture             | 3                  | 2                                     | 1        | 0               |
| 3        | Artistic movements of the twentieth century and their influence on architecture art                               | 3                  | 2                                     | 1        | 0               |
| 4        | Modern School Trends (De Steel - Bauhaus _ and Their Impact on Architecture Arts).                                | 3                  | 2                                     | 1        | 0               |
| 5        | <b>Quiz 1</b> & practicing of analyze School Trends (De Steel - Bauhaus _ and Their Impact on Architecture Arts). | 3                  | 2                                     | 1        | 0               |
| 6        | Aesthetic features in architectural art formations that complement different design ideas                         | 3                  | 2                                     | 1        | 0               |
| 7        | <b>Revision and Mid Exam</b>                                                                                      |                    |                                       |          |                 |
| 8        | The foundations of the aesthetics of artistic architectural formations of (variation, poise, rhythm.....)         | 3                  | 2                                     | 1        | 0               |
| 9        | Analyze horizontal projection of formations of architectural forms that fulfill the principle of design           | 3                  | 2                                     | 1        | 0               |
| 10       | The relationship between creativity in arts and architectural design                                              | 3                  | 2                                     | 1        | 0               |
| 11       | Aesthetic features in contemporary and future architecture arts                                                   | 3                  | 2                                     | 1        | 0               |
| 12       | Revision.                                                                                                         | 3                  | 2                                     | 1        | 0               |
| 13       | semi final                                                                                                        | 3                  | 2                                     | 1        | 0               |
| 14       | Final project+general discussion                                                                                  | 3                  | 2                                     | 1        | 0               |
| 15,16    | <b>Final Exam.</b>                                                                                                |                    |                                       |          |                 |

## 5- Methods of students' assessment:

| No. | Assessment Methods *                         | Assessment Timing<br>(Week Number) | Marks/<br>Scores | Percentage<br>of<br>total<br>course<br>Marks |
|-----|----------------------------------------------|------------------------------------|------------------|----------------------------------------------|
| 1   | Quiz 1 written<br>(Semester work)            | 5                                  | 10               | 10 %                                         |
| 2   | Midterm exam                                 | 7                                  | 20               | 20 %                                         |
| 3   | Final Written Exam                           | 15, 16                             | 40               | 40 %                                         |
| 4   | Final Oral Exam                              | 14                                 | 5                | 5 %                                          |
| 5   | Assignments / Project<br>/Portfolio/ Logbook | 1,2,3,4,5,6,8,9,10,11,12,13,14     | 25               | 25 %                                         |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning<br>resources<br>(books,<br>scientific<br>references,<br>etc.) * | The main (essential) reference<br>(must be written in full according to<br>the scientific documentation method) | <p>Abdel-Gawad, T. A. (1955). <i>History of Architecture and Arts in the</i></p> <p><i>Early Ages (in Arabic)</i>. Cairo: Supreme Council of Antiquities</p> <p>Cruikshank, D. (1999). <i>A History of Architecture</i>. New Delhi: CBS Publisher</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                          | Other References                                                                                                | <ul style="list-style-type: none"> <li>• White, Edward T (1975): A Vocabulary of Architectural Forms, Architectural Media.</li> <li>• William (Author) (2010): The Art of Drawings, Madison Books; Revised ed. Edition.</li> <li>• Architecture, Form, Space, and Order by Frank Ching</li> <li>• Francis D.K. Ching (2007): Architecture: Form. Space &amp; Order, Van Nostrand</li> <li>• Reinhold, New York. Paul Zelenski, Mary Pat Fisher (2006): Shaping Space: The Dynamics of Three-Dimensional Design, (3rd edition).<br/>www.amazon.com</li> <li>• Stephen Luecking (2002): Principles of Three-Dimensional Design: Objects, Space and Meaning, www.amazon.com</li> <li>• Wucius Wong (1977): Principles of Three-Dimensional Design, Van Nostrand Reinhold Company, New York</li> <li>• "The Architecture of Happiness" by Alain de Botton (2006): Examines the relationship between architecture and human well-being, combining philosophy and design.</li> <li>• "The Future of Architecture in 100 Buildings" by Marc Kushner</li> </ul> |



|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <p>(2015): Explores innovative and groundbreaking architectural designs from around the world.</p> <ul style="list-style-type: none"> <li>• <b>Bauhaus: A Conceptual Model" by Boris Friedewald (2019):</b><br/>A comprehensive look at the Bauhaus movement and its impact on architecture and design</li> <li>• <b>The Art of Looking Up" by Catherine McCormack (2019):</b> A visual feast exploring the diverse world of ceilings in significant buildings worldwide.</li> <li>• <b>The Hare with Amber Eyes" by Edmund de Waal (2010):</b> Though not the latest, it's a notable work exploring the history of a collection of Japanese netsuke through generations.</li> <li>• <b>Norman, D. (2023). <i>Design for a better world:</i></b> Meaningful, sustainable, humanity centered. The MIT Press.</li> <li>• <b>Peters, S. (2024). <i>Architectural material systems:</i></b> Conceptual design strategies. Birkhäuser.</li> <li>• <b>Fowkes, M., &amp; Fowkes, R. (2023). <i>Art and climate change:</i></b> A concise <i>history</i>. Thames &amp; Hudson.</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li>• <a href="http://www.sagradafamilia.org/en/">http://www.sagradafamilia.org/en/</a></li> <li>• <a href="https://www.skyscrapercity.com/">https://www.skyscrapercity.com/</a></li> <li>• <a href="http://www.design-theory.com/">http://www.design-theory.com/</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | <p>Data show (projector)</p> <p>Laptop or desktop computer</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b> |
|------------------|-------------------------------------------------------------------------------------|----------------------------|
| <b>Name</b>      | Assoc. Prof. Sahar Ezz El Arab Ramadan                                              | <b>Dr.Maysa Ali Selim</b>  |
| <b>Signature</b> |  | <i>maysa selim</i>         |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Mathematics 4</b>                      |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MTH 102</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  | <b>2</b>         |                        | <b>4</b>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Afaf Hatem Syam                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Differential Equation of the first order (Separable differential equations – Homogeneous differential equations – Exact differential equations – Integrating factor – Linear differential equations) Higher order differential equations – The differential operators – The complementary solution – Evolution of particular solution (Inverse operator Lagrange's method Reduction of order – Cauchy Euler Type differential equations) - system of Differential equations - Special Functions ( Gamma – Beta – Lagender- Bessel ) –Laplace Transform – Solution of ordinary differential equations using Laplace methods.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

| Program Outcomes (NARS/ARS)<br>(according to the matrix in the program specs) |                                                                                                             | Course Learning Outcomes                                    |                                                                                       |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------|
| A1, A5, A10                                                                   |                                                                                                             | Upon completion of the course, the student will be able to: |                                                                                       |
| Code                                                                          | Text                                                                                                        | Code                                                        | Text                                                                                  |
| A1                                                                            | A1. Identify, formulate, and solve complex engineering problems by using differential equations techniques. | LO1                                                         | Apply the the technique which is appropriate the given problem.                       |
|                                                                               |                                                                                                             | LO2                                                         | Describe the required conditions for solving the D.E. by the given method.            |
|                                                                               |                                                                                                             | LO3                                                         | Solve D.E. by available methods.                                                      |
| A5                                                                            | Practice research techniques and methods of investigation as an inherent part of learning.                  | LO5                                                         | Distinguish the type of the given one which with constants or variables coefficients. |
|                                                                               |                                                                                                             | LO4                                                         | Identify the number of solutions according to the given equation.                     |
| A10                                                                           | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.                 | LO6                                                         | Assess the special functions for solving problems.                                    |
|                                                                               |                                                                                                             | LO7                                                         | Access the special functions for solving some integrations.                           |
|                                                                               |                                                                                                             | LO8                                                         | Evaluate the laplace transform for solving engineering problems.                      |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        | √          |                       | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)  | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                      |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                      |                    |                                       | Tutorial | / Practical Lab |
| 1        | Types and order of the differential equations (D.Es) | 4                  | 2                                     | 2        | 0               |
| 2        | First D.Es                                           | 4                  | 2                                     | 2        | 0               |
| 3        | Separation and Homogenous D.Es                       | 4                  | 2                                     | 2        | 0               |
| 4        | Exact and not Exact D.Es                             | 4                  | 2                                     | 2        | 0               |
| 5        | Linear and Bernoulli D.Es                            | 4                  | 2                                     | 2        | 0               |
| 6        | Homogenous Higher order D.Es                         | 4                  | 2                                     | 2        | 0               |
| 7        | Revision and Mid Exam                                |                    |                                       |          |                 |
| 8        | Lagrange method for D.Es                             | 4                  | 2                                     | 2        | 0               |
| 9        | Cauchy Euler for D.Es with Variable coefficients     | 4                  | 2                                     | 2        | 0               |

|       |                                                   |   |   |   |   |
|-------|---------------------------------------------------|---|---|---|---|
| 10    | Laplace transform for D.Es                        | 4 | 2 | 2 | 0 |
| 11    | Gamma function                                    | 4 | 2 | 2 | 0 |
| 12    | Betta function                                    | 4 | 2 | 2 | 0 |
| 13    | Applications of Gamma function and Betta function | 4 | 2 | 2 | 0 |
| 14    | Lagrange method for D.Es                          | 4 | 2 | 2 | 0 |
| 15,16 | Final Exam.                                       |   |   |   |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 3                               | 10            | 10%                              |
| 2   | Exam 2 written (Semester work) | 12                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 7   | Assignments                    | 13,14                           | 20            | 20%                              |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ol style="list-style-type: none"> <li>1. Schaum's Outline of Differential Equations, 5th Edition, ISBN: 9781264258826, 2022McGraw Hill.</li> <li>2. Erwin Kreyszig, Advanced Engineering Mathematics, Edition 10 (2011), Wiley.</li> <li>3. Earl W. Swokowski, "Calculus".</li> <li>4. Thomas' Calculus: Early Transcendentals</li> <li>5. Richard Bronson (Author), Gabriel B. Costa, Schaum's Outline of Differential Equations, Fifth Edition</li> <li>6. Erwin Kreyszig, Advanced Engineering Mathematics</li> </ol> |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                    |                                                                                                                                                                                                                                                                                                                        |
|--|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                    | <p>7. Richard Bronson, Schaum's Outline of Differential Equations</p> <p>8. <i>Lawrence Perkom</i> ' Differential Equations and Dynamical Systems', Third Edition</p>                                                                                                                                                  |
|  | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://www.cuemath.com/trigonometry/inverse-trigonometric-functions/">https://www.cuemath.com/trigonometry/inverse-trigonometric-functions/</a><br><a href="https://www.cuemath.com/trigonometry/inverse-trigonometric-functions/">https://www.cuemath.com/trigonometry/inverse-trigonometric-functions/</a> |
|  | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                 |

|                  | Course Coordinator  | Program Coordinator                                                                |
|------------------|---------------------|------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr. Afaf Hatem Syam | Prof. Ahmed Abd El-Gafar                                                           |
| <b>Signature</b> | <i>AH Syam</i>      |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Statistics and Probability Theory</b>  |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MTH 105</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 |                                           |                  |                        |              |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Tarek Nassar                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Probability, conditional probabilities, Bayes' theorem. Tendency and Dispersion Measures: Introduction, different types of data, tendency measures, variability measures, frequency distributions. Random Variables: Discrete random variables, the Hyper - geometric distribution, Binomial distribution, the Poisson distribution, Poisson approximation of binomial probabilities, continuous random variables. Moments: central moments, Skewness measures, kurtosis measures, moment generating function. Sampling Theory and Inferences: the concept Of a sampling distribution, sampling distribution of the mean, central limit theorem, tests of hypothesis and Confidence intervals for the mean, tests of hypothesis and confidence intervals for the difference between two means, tests of hypothesis and confidence intervals for the population proportion, tests of hypothesis and confidence intervals for the difference between two proportions, tests of hypothesis and confidence intervals of sample variance, tests of hypothesis and confidence interval for ratio of sample variances. Simple regression and correlation: Simple linear regression by least square method, validation of the model, correlation coefficient.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

| Program Outcomes (NARS/ARS)<br>(according to the matrix in the program specs) |                                                                                                                                   | Course Learning Outcomes                                    |                                                                                                                        |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| (A1, A2, A4, A5, A6)                                                          |                                                                                                                                   | Upon completion of the course, the student will be able to: |                                                                                                                        |
| Code                                                                          | Text                                                                                                                              | Code                                                        | Text                                                                                                                   |
| A1                                                                            | Identify and apply the different statistical measurements for analyzing data. Recognize the axioms of the probability             | L01                                                         | Apply the different statistical measurements for analyzing grouped and ungrouped data.                                 |
|                                                                               |                                                                                                                                   | L02                                                         | Recognize the axioms of the probability to calculate the probability for any event.                                    |
| A2                                                                            | Apply techniques for calculate probabilities, expectation, and variance.                                                          | L03                                                         | Apply several techniques of counting and calculus to calculate probabilities, mean, and variance for random variable.  |
| A4                                                                            | Represent the data and compute the strength of relation between variables and estimate the regression equation                    | L04                                                         | Represent: box plot, stem&leaf, histogram, frequency polygon, and scatter diagram.                                     |
|                                                                               |                                                                                                                                   | L05                                                         | Compute the relation strength between two variables, and predict one variable by another with the regression equation. |
| A5                                                                            | Classify random variables and density function.                                                                                   | L06                                                         | Connect between a random variable and density function.                                                                |
|                                                                               |                                                                                                                                   | L07                                                         | Apply different type of probability distributions to solve probability problem.                                        |
| A6                                                                            | Utilize engineering probability, problems, for safety requirements and apply codes of practice and standards, quality guidelines. | L08                                                         | Use the confidence interval method to compute the mean interval.                                                       |
|                                                                               |                                                                                                                                   | L09                                                         | Use the test of hypothesis method to predict the mean interval.                                                        |



#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        |            | √                     |                    | √          |                |            | √             | √                  |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                    |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                    |                    |                                       | Tutorial | Lab / Practical |
| 1        | Introduction of statistics - Organized and represent of ungrouped data                             | 4                  | 2                                     | 2        |                 |
| 2        | Organized and represent of grouped data                                                            | 4                  | 2                                     | 2        |                 |
| 3        | Determine the Spearman's and Pearson's coefficient correlation and compute the regression equation | 4                  | 2                                     | 2        |                 |
| 4        | General revision and quiz (1)                                                                      | 4                  | 2                                     | 2        |                 |
| 5        | Introduction of probability: Sample space and Events – Counting Techniques                         | 4                  | 2                                     | 2        |                 |
| 6        | Random variables Discrete and continuous and their probability distribution                        | 4                  | 2                                     | 2        |                 |

|       |                                                                                                   |   |   |   |  |
|-------|---------------------------------------------------------------------------------------------------|---|---|---|--|
| 7     | <b>Mid Exam</b>                                                                                   |   |   |   |  |
| 8     | <b>Probability distribution: Binomial , Poisson</b>                                               | 4 | 2 | 2 |  |
| 9     | <b>Probability distribution: normal, standard, student</b>                                        | 4 | 2 | 2 |  |
| 10    | <b>Relation between distributions</b>                                                             | 4 | 2 | 2 |  |
| 11    | <b>Confidence interval to find the mean interval of the mean population</b>                       | 4 | 2 | 2 |  |
| 12    | <b>Hypothesis Testing (The structure of a hypothesis test and testing the mean of population)</b> | 4 | 2 | 2 |  |
| 13    | <b>General revision and quiz (2)</b>                                                              | 4 | 2 | 2 |  |
| 14    | <b>Sheet and report</b>                                                                           | 4 | 2 | 2 |  |
| 15,16 | <b>Final Exam.</b>                                                                                |   |   |   |  |

### 5- Methods of students' assessment:

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work)            | 4                               | 15            | 15%                              |
| 2   | Quiz 2 written (Semester work)            | 13                              | 15            | 15%                              |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 5   | Final Practical/Clinical/... Exam         |                                 | 0             |                                  |
| 6   | Final Oral Exam                           |                                 | 0             |                                  |
| 7   | Assignments / Project /Portfolio/ Logbook | 14                              | 0             | 10%                              |
| 8   | Field training                            |                                 | 0             |                                  |
| 9   | Other (Mention)                           |                                 | 0             |                                  |

### 6- Learning Resources and Supportive Facilities \*

|                           |                                                                                                                     |                                                                                        |
|---------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>Learning resources</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | Introduction to Probability and Statistics for Engineers and Scientists, By Sheldon M. |
|---------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                             |
|--------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(books, scientific references, etc.) *</b>                            |                                                    | Ross, 2021 Elsevier, ISN: 978-0-12-824346-6, <b>6<sup>th</sup> edition.</b>                                                                 |
|                                                                          | <b>Other References</b>                            | Probability and Statistics for STEM: A Course in One Semester, By E.N. Barron, J.G. Del Greco, 2022 Springer series, ISN: 978-3-031-02427-6 |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) |                                                                                                                                             |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                      |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | White board                                                                                                                                 |
|                                                                          | <b>Supplies</b>                                    | Teaching aids and power point                                                                                                               |
|                                                                          | <b>Electronic Programs</b>                         |                                                                                                                                             |
|                                                                          | <b>Skill Labs/ Simulators</b>                      |                                                                                                                                             |
|                                                                          | <b>Virtual Labs</b>                                |                                                                                                                                             |
|                                                                          | <b>Other</b> (to be mentioned)                     |                                                                                                                                             |

|                  | <b>Course Coordinator</b>      | <b>Program Coordinator</b>                                                          |
|------------------|--------------------------------|-------------------------------------------------------------------------------------|
| <b>Name</b>      | Ass. Prof. Tarek Nassar        | Prof. Ahmed Abd El-Gafar                                                            |
| <b>Signature</b> | <i>Ass. Prof. Tarek Nassar</i> |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Fluid Mechanics</b>                    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 121</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Properties of Fluids: Statics of Fluids, Equation of One Dimension. Flow over Notches and weirs, Rotary Motion of Fluids, Flow of Viscous Flow of Fluids. Surface Resistance; Introduction to the Boundary Layer Theory; Resistance in Pipes and Conduits to fluid flow.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | Course Learning Outcomes                                    |                                                                            |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------|
| A1, A2, A5, B1                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | Upon completion of the course, the student will be able to: |                                                                            |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                        | Code                                                        | Text                                                                       |
| <b>A1</b>                                                                 | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic Science and mathematics.                                                                                                                                                                                                                                                                            | <b>LO1</b>                                                  | Describe the properties of fluid mechanics and solve engineering problems. |
| <b>A2</b>                                                                 | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                            | <b>LO2</b>                                                  | conduct appropriate experimentation of Notch and venturimeter              |
| <b>A5</b>                                                                 | Practice research techniques and methods of investigation as an inherent part of learning                                                                                                                                                                                                                                                                                                                   | <b>LO3</b>                                                  | Practice research techniques                                               |
| <b>B1</b>                                                                 | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                                                  | Study the physical measurements.                                           |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       | √                  |            |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                              | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                  |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                  |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to fluid mechanics)                                                 | 3                  | 2                                     | 0        | 1               |
| 2        | Fluid properties of matter                                                       | 3                  | 2                                     | 0        | 1               |
| 3        | Fluid pressure and its measurements                                              | 3                  | 2                                     | 0        | 1               |
| 4        | Total pressure on a horizontally immersed surface – an inclined immersed surface | 3                  | 2                                     | 0        | 1               |
| 5        | Hydrostatic forces on Horizontal and vertical plates                             | 3                  | 2                                     | 0        | 1               |
| 6        | Hydrostatic forces on curved plates                                              | 3                  | 2                                     | 0        | 1               |
| 7        | Revision and Mid Exam                                                            |                    |                                       |          |                 |

|       |                                                                                                                                                                                                        |   |   |   |   |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 8     | Equilibrium of Floating Bodies ( Introduction – Buoyancy – Center of buoyancy – Meta-centre – Meta-centric height–Conditions of equilibrium of a floating body )                                       | 3 | 2 | 0 | 1 |
| 9     | Fluid masses subjected to Acceleration                                                                                                                                                                 | 3 | 2 | 0 | 1 |
| 10    | Vortex Flow ( introduction – Forced vortex flow – Equation of forced vortex flow x flow                                                                                                                | 3 | 2 | 0 | 1 |
| 11    | Hydro-kinematics ( introduction – rate of discharge – equation of continuity of a liquid flow – motion of fluid particle – types of flow lines – path lines – stream lines – types of flow in motion ) | 3 | 2 | 0 | 1 |
| 12    | Bernoulli's Equation and its                                                                                                                                                                           | 3 | 2 | 0 | 1 |
| 13    | Momentum Equations and its applications                                                                                                                                                                | 3 | 2 | 0 | 1 |
| 14    | Revision                                                                                                                                                                                               | 3 | 2 | 0 | 1 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                     |   |   |   |   |

### **Experiment Topics: (If any)**

| Serial | Experiment                                  |
|--------|---------------------------------------------|
| 1      | Expermental work for open channel hydraulic |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 6                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments                    | weekly                          | 15            | 15 %                             |
| 6   | Final Practical                | 14                              | 5             | 5 %                              |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Fluid Mechanics and Hydraulic Machines labort, S.k.panigrahi, S.k. Kataria, 12376, INDIA, 2024</li> <li>S.K. Sharma, Hydraulic Structures Design of Irrigation Structures, RSM Press, ISBN-13: 978-9352533770, January 2017.</li> <li></li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>C. Nalluri, Martin Marriott, Civil Engineering Hydraulics, Wiley – Blackwell, 5th. Ed., 2009.</li> <li>Fluid Mechanics by Streeter &amp; Wylie, Tata McGraw Hill.</li> </ul>                                                                      |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://www.Fluidmechanics.org/">https://www.Fluidmechanics.org/</a></li> </ul>                                                                                                                                                          |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                   |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Hydraulic laboratory                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Supplies</b>                                                                                                     | Data Show, White Board                                                                                                                                                                                                                                                                   |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                       |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Civil Engineering Drawing II</b>       |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 122</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 0                                         | 4                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b>Civil Engineering</b>                  |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Civil and Irrigation Detail Drawing structures: Earth slopes, Retaining walls, Some Civil and Irrigation Structures, Introduction to Computer aided Drafting.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                          |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A8, B1, B2</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                          |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                              |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                            | <b>LO1</b>                                                         | Identify earth works.                                                                                                                                                                    |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>LO2</b>                                                         | Classify different water structures.                                                                                                                                                     |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>LO3</b>                                                         | Develop simulation using civil engineering drawing.                                                                                                                                      |
| <b>A8</b>                                                                        | Communicate effectively – graphically, verbally and in writing – with range of audiences using contemporary tools.                                                                                                                                                                                                                                                                                           | <b>LO4</b>                                                         | Produce drawing schedules that accompany their design projects, describing the project's scope, design criteria, in a clear, well-structured, and professional manner                    |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Simulate water structures using AutoCAD program.                                                                                                                                         |
| <b>B2</b>                                                                        | Achieve an optimum design of irrigation Structures and the following civil engineering topics such as Water relevant to the discipline.                                                                                                                                                                                                                                                                      | <b>LO6</b>                                                         | Ensure their designs and drawings comply with relevant local and international standards for irrigation and hydraulic structures to guarantee safety, functionality, and sustainability. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       |                    | √          |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics) | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                     |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction for irrigation structures drawing      | 4                  | 0                                     | 0        | 4               |
| 2        | Canal cross section                                 | 4                  | 0                                     | 0        | 4               |
| 3        | Change in levels                                    | 4                  | 0                                     | 0        | 4               |
| 4        | Upstream wing walls using AutoCAD program           | 4                  | 0                                     | 0        | 4               |
| 5        | Down Stream wing walls using AutoCAD program        | 4                  | 0                                     | 0        | 4               |
| 6        | Quiz                                                | 4                  | 0                                     | 0        | 4               |
| 7        | Revision and Mid Exam                               |                    |                                       |          |                 |

|    |                                                                 |   |   |   |   |
|----|-----------------------------------------------------------------|---|---|---|---|
| 8  | Drawing of bridge structure on streams using AutoCAD program    | 4 | 0 | 0 | 4 |
| 9  | Drawing of Culverts structures on streams using AutoCAD program | 4 | 0 | 0 | 4 |
| 10 | Drawing of Syphons structures on streams using AutoCAD program  | 4 | 0 | 0 | 4 |
| 11 | Quiz                                                            | 4 | 0 | 0 | 4 |
| 12 | Drawing of weirs structures on streams using AutoCAD program    | 4 | 0 | 0 | 4 |
| 13 | Drawing of Locks Structures on streams using AutoCAD program    | 4 | 0 | 0 | 4 |
| 14 | <b>Final Exam.</b>                                              |   |   |   |   |

5- Methods of students' assessment:

| No. | Assessment Methods *         | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Assignments (Semester work)  | All Weeks                       | 15            | 15 %                             |
| 2   | Exam 1 (Semester work)       | 6                               | 10            | 10 %                             |
| 3   | Midterm exam                 | 7                               | 30            | 30 %                             |
| 4   | Final Written/Practical Exam | 14                              | 30            | 30 %                             |
| 5   | Assignments / Project        | 13                              | 15            | 15%                              |

6- Learning Resources and Supportive Facilities \*

|                                                                  |                                                                                                                     |                                  |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | •                                |
|                                                                  | <b>Other References</b>                                                                                             | •                                |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | •                                |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office           |
| <b>Supportive facilities &amp; equipment for teaching</b>        | <b>Devices/Instruments</b>                                                                                          | computer laboratory              |
|                                                                  | <b>Supplies</b>                                                                                                     | Data Show, White Board – MS Team |
|                                                                  | <b>Electronic Programs</b>                                                                                          | --                               |
|                                                                  | <b>Skill Labs/ Simulators</b>                                                                                       | --                               |
|                                                                  | <b>Virtual Labs</b>                                                                                                 | --                               |

|                   |  |  |
|-------------------|--|--|
| and<br>learning * |  |  |
|-------------------|--|--|

|           | Course Coordinator                                                                | Program Coordinator                                                                |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Name      | Ass. Prof. Samah Hassan                                                           | Dr. Ghada Nashaat Mohamed                                                          |
| Signature |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                                |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Properties and Testing of Materials (2)</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 123</b>                                 |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                             | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                              | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | <b>Compulsory</b>                              |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                               |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                              |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>          |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Sherif H. Al-Tersawy                     |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department      |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                             |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Aggregates for concrete: types, properties, grading tests. Cement: manufacturing, properties, special types of cement, tests. Concrete: constituents, admixtures, proportioning, manufacturing-fresh concrete, hardening, stage-hardening concrete, tests, special concrete, concrete mix design.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | Course Learning Outcomes                                    |                                                                                                                |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| A2, A4, A10, B1                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | Upon completion of the course, the student will be able to: |                                                                                                                |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                        | Code                                                        | Text                                                                                                           |
| A2.                                                                       | Develop and conduct appropriate experimentation and/or simulation, analyse and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | LO1                                                         | Identify fundamentals                                                                                          |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO2                                                         | Formulate and understand mix design equations                                                                  |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO3                                                         | Conduct experiments for Aggregates, cement, fresh and hardened concrete                                        |
| A4.                                                                       | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles                                                                                                                                                                                                                                | LO4                                                         | Utilize codes and standards in choice concrete ingredients and manufacturing process                           |
| A10                                                                       | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies                                                                                                                                                                                                                                                                                                                  | LO5                                                         | Select material properties according to design requirements and field conditions.                              |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO6                                                         | Use admixtures or industrial wastes as admixtures for Special concretes.                                       |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO7                                                         | Use testing of aggregates, cement, fresh concrete, and hard concrete as a requirement of selected of materials |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |                |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|----------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | MICROSOFT TEAM | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  |            |                |            |               |                    |                                          |              | √              |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)          | Total Weekly Hours | Expected number of the Learning Hours |          |                |
|----------|--------------------------------------------------------------|--------------------|---------------------------------------|----------|----------------|
|          |                                                              |                    | Theoretical teaching<br>(lectures)    | Training |                |
|          |                                                              |                    |                                       | Tutorial | Practical /Lab |
| 1        | Types of materials, their characteristics                    | 3                  | 2                                     | -        | 1              |
| 2        | Physical and mechanical properties of aggregate              | 3                  | 2                                     | -        | 1              |
| 3        | Testing of physical and mechanical properties of aggregates. | 3                  | 2                                     | -        | 1              |
| 4        | Manufacturing and composition of Ordinary Portland Cement.   | 3                  | 2                                     | -        | 1              |
| 5        | Types of cement and tests of cement                          | 3                  | 2                                     | -        | 1              |
| 6        | Mixing water quality and quantity.                           | 3                  | 2                                     | -        | 1              |
| 7        | <b>Revision and Mid Exam</b>                                 |                    |                                       |          |                |
| 8        | Concrete Admixtures and waste recycle                        | 3                  | 2                                     | -        | 1              |
| 9        | Admixtures and Special concretes.                            | 3                  | 2                                     | -        | 1              |



|       |                                                                                                       |   |   |   |   |
|-------|-------------------------------------------------------------------------------------------------------|---|---|---|---|
|       | Introduction to Chemical Admixtures and Their Applications                                            |   |   |   |   |
| 10    | Manufacturing of concrete                                                                             | 3 | 2 | - | 1 |
| 11    | Fresh concrete and tests.                                                                             | 3 | 2 | - | 1 |
| 12    | Hard concrete and tests.<br>Mix Design Fundamentals and International Code Comparisons (ACI, BS, ECP) | 3 | 2 | - | 1 |
| 13    | absolute volume mix design.                                                                           | 3 | 2 | - | 1 |
| 14    | ACI method for mix design<br>Case Studies on Mix Design and Admixture Applications in Industry        | 3 | 2 | - | 1 |
| 15,16 | <b>Final Exam.</b>                                                                                    |   |   |   |   |

### **Experiment Topics: (If any)**

| Serial | Experiment                                                                           |
|--------|--------------------------------------------------------------------------------------|
| 1      | Sieve analysis, physical , and mechanical tests of aggregates                        |
| 2      | Tests of cements.                                                                    |
| 3      | Effects of admixtures, fresh concrete tests, and compressive strength test sampling. |
| 4      | Hard concrete testing (compression, indirect tension, flexure)                       |

### **5- Methods of students' assessment:**

| No. | Assessment Methods * | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz (1)             | 6                               | 7             | 7%                               |
| 2   | Quiz (2)             | 13                              | 8             | 8%                               |
| 3   | Midterm exam         | 7                               | 20            | 20 %                             |
| 4   | Assignments          | 5,12                            | 10            | 10%                              |
| 5   | Lab. Reports         | Every lab.                      | 10            | 10%                              |
| 6   | Final Practical Exam | 13                              | 5             | 5%                               |
| 7   | Final Written Exam   | 15, 16                          | 40            | 40 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                               |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | -BASIC CIVIL ENGINEERING, B.C.PUNMIA, LAXMI PUBLICATI, INDIA, 2023<br>الملحق الثالث للكود المصرى-                             |
|                                                                          | <b>Other References</b>                                                                                             | CIVIL ENGINEERING:BUILDING MATERIALS PROPERTI, CAYSON CARTER , MURPHY & MOORE, NEW YORK, 2023                                 |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  |                                                                                                                               |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office<br><a href="#">General</a>   <a href="#">CIV 123 - 3rd Term 2024</a>   <a href="#">Microsoft Teams</a> |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          |                                                                                                                               |
|                                                                          | <b>Supplies</b>                                                                                                     |                                                                                                                               |
|                                                                          | Data Show                                                                                                           | √                                                                                                                             |
|                                                                          | - Materials Lab                                                                                                     | √                                                                                                                             |
|                                                                          | <b>MS teams</b>                                                                                                     | √                                                                                                                             |
|                                                                          |                                                                                                                     |                                                                                                                               |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Prof. Sherif H. Al-Tersawy</b>                                                   | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Field Training (1)</b>                 |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>FTR 131</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | --                                        | 18               |                        | 18           |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SOPHOMORE</b>                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed abd Ellatief                    |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Training shall concentrate on traditional site works, using different types of materials and different techniques. The student shall try to apply such techniques manually if possible. The student shall be trained to use the surveying equipment, which he studied at the in-situ tutorial, to prepare and plan the site.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                     |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>A2, A9, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                     |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                         |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Uses different materials and construction methods.                                                  |
| <b>A9</b>                                                                        | Use creative innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Choose the creative solution for constructing structures with different surveying devices.          |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                                                         | Detects many construction methods.to apply a full range of civil engineering concept and techniques |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO4</b>                                                         | Distinguishes properties technology for construction analysis by construction methods               |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
|                    |                      |                      |                        |            |                       | √                  |            | √              | √          |               |                    |                                          |              |            |                 |

#### Course Schedule:

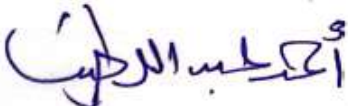
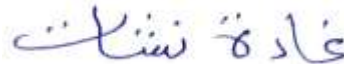
| Week No. | Scientific content of the course<br>(Course Topics)                                                                        | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                            |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                            |                    |                                       | Tutorial | Practical / Lab |
| 1        | Ability of using different materials and construction methods.<br>ورشة الحدادة – ورشة النجارة المسلحة                      | 18                 | --                                    | --       | 18              |
| 2        | Choose the creative solution for constructing structures with different surveying devices.<br>ورشة البياض – ورشة الدهان    | 18                 | --                                    | --       | 18              |
| 3        | Revision and Mid Exam                                                                                                      |                    |                                       |          |                 |
| 4        | Applying a full range of civil engineering concept and techniques by construction methods.<br>ورشة السباكة – ورشة الكهرباء | 18                 | --                                    | --       | 18              |
| 5        | Preparing and planning the site.<br>ورشة النجارة عمارة – ورشة المباني                                                      | 18                 | --                                    | --       | 18              |
| 6        | Final Exam.                                                                                                                |                    |                                       |          |                 |

**5- Methods of students' assessment:**

| No. | Assessment Methods *              | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-----------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)    | --                              | --            | --                               |
| 2   | Exam 2 written (Semester work)    | --                              | --            | --                               |
| 3   | Midterm exam                      | 3                               | 20            | 20 %                             |
| 4   | Final Written Exam                | --                              | --            | --                               |
| 5   | Final Practical/Clinical/... Exam | --                              | --            | --                               |
| 6   | Final Oral Exam                   | 6                               | 30            | 30%                              |
| 7   | Assignments / Report /Portfolio   | 5                               | 25            | 25 %                             |
| 8   | Field training                    | Weekly                          | 25            | 25%                              |

**6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                    |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | • -----                                                                                                                            |
|                                                                          | <b>Other References</b>                                                                                             | • -----                                                                                                                            |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | • -----                                                                                                                            |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                             |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | ورشة الحدادة – ورشة النجارة المسلحة – ورشة البياض – ورشة الدهان – ورشة السباكة – ورشة الكهرباء – ورشة النجارة عمارة – ورشة المباني |
|                                                                          | <b>Supplies</b>                                                                                                     | ---                                                                                                                                |
|                                                                          | <b>Electronic Programs</b>                                                                                          | ---                                                                                                                                |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | ---                                                                                                                                |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | ---                                                                                                                                |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | ---                                                                                                                                |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | Dr. Ahmed abd Ellatief                                                              | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Entrepreneurship</b>                   |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>Hum 206</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Mechanical Engineering</b>             |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  | <b>--</b>        | <b>--</b>              | <b>2</b>     |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b>Mechanical Engineering</b>             |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Dr.Moataz Mohamed Abd El-Raouf</b>     |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | 8/12/2025                                 |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Preparation of students to consider his own small business project: Introduction to entrepreneurship, Definition of different project scales, characteristics of small project, planning of small project, small project organization, small project control, performance evaluation. application course project.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                | Course Learning Outcomes                                    |                                                                                                                                        |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| (A6, A8, A9, A10)                                                         |                                                                                                                                                | Upon completion of the course, the student will be able to: |                                                                                                                                        |
| Code                                                                      | Text                                                                                                                                           | Code                                                        | Text                                                                                                                                   |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                       | LO.1                                                        | Design thinking and process tools to evaluate real-world problems and projects.                                                        |
| A8                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                           | LO.2                                                        | Create presentations and business plans that articulate and apply financial, operational, organizational, market, and sales knowledge. |
|                                                                           |                                                                                                                                                | LO.3                                                        | Mobilize people and resources.                                                                                                         |
| A9                                                                        | Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations. | LO4.                                                        | Elaborate on students to consider their own small business project.                                                                    |
|                                                                           |                                                                                                                                                | LO5.                                                        | Analyze methodologies to Sell themselves and their ideas.                                                                              |
| A10                                                                       | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.                                                    | LO6.                                                        | Cultivate endurance to foster self-efficacy through improved communication and problem-solving skills                                  |

### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brainstorming        | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    |                        |            |                       | √                  |            |                |            |               |                    |                                          |              | √          | √               |



### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                     | Total<br>Weekly<br>Hours | Expected number of the<br>Learning Hours |          |                    |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------|----------|--------------------|
|          |                                                                                                                                                                                                         |                          | Theoretical<br>teaching<br>(lectures)    | Training |                    |
|          |                                                                                                                                                                                                         |                          |                                          | Tutorial | Practical<br>Lab / |
| 1        | *Definition of Entrepreneurship.<br>*What is meant by: Entrepreneur?<br>* Competencies of entrepreneur.                                                                                                 | 2                        | 2                                        | -        | -                  |
| 2        | *Main processes of Entrepreneurship.<br>*The difference between entrepreneurship projects and small enterprises.<br>*Inspiring Entrepreneurs Story of KINGINE Founders.                                 | 2                        | 2                                        | -        | -                  |
| 3        | *The role of entrepreneurship and small enterprises in the development of the economy of countries.<br>*Classification of different types of pilot projects.                                            | 2                        | 2                                        | -        | -                  |
| 4        | *Entrepreneurship between science and talent.<br>*Success story of an entrepreneur (jewellery designer Azza Fahmi).                                                                                     | 2                        | 2                                        | -        | -                  |
| 5        | Stages of Entrepreneurship Process:<br>*Identify and evaluate the opportunity.<br>*Develop business plans.<br>*Resources required.<br>*Manage the enterprise.<br>Success story of an entrepreneur: Nike | 2                        | 2                                        | -        | -                  |
| 6        | -Entrepreneurial problems.<br>-Why do so many small projects fail? +<br>Online Quiz                                                                                                                     | 2                        | 2                                        | -        | -                  |
| 7        | <b>Revision and Mid Exam</b>                                                                                                                                                                            |                          |                                          |          |                    |
| 8        | -Success stories of Ingvar Kaber: IKEA Founder.<br>-Definition of: Business incubators including its Importance.                                                                                        | 2                        | 2                                        | -        | -                  |
| 9        | -Basic services provided by business incubators.<br>-Classification of Business incubators.<br>-Proportions of services provided by business incubators.                                                | 2                        | 2                                        | -        | -                  |
| 10       | -Examples Global and local Business incubators<br>-success stories of El Araby Group.                                                                                                                   | 2                        | 2                                        | -        | -                  |

|       |                                       |   |   |   |   |
|-------|---------------------------------------|---|---|---|---|
|       | + Online Quiz                         |   |   |   |   |
| 11    | Entrepreneurial Project Presentations | 2 | 2 | - | - |
| 12    | Entrepreneurial Project Presentations | 2 | 2 | - | - |
| 13    | Entrepreneurial Project Presentations | 2 | 2 | - | - |
| 14    | Revision                              | 2 | 2 | - | - |
| 15,16 | <b>Final Exam.</b>                    |   |   |   |   |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work or quiz)    | 6                               | 15            | 15%                              |
| 2   | Exam 2 written (Semester work or quiz)    | 10                              | 15            | 15%                              |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 7   | Assignments / Project /Portfolio/ Logbook | 11,12,13                        | 10            | 10%                              |

#### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                              |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Nieuwenhuizen, C. <i>Basics of entrepreneurship</i>. Juta and Company Ltd. (2004).</li> <li>Kuratko, D. F. <i>Entrepreneurship: Theory, process, and practice</i>. Cengage learning.(2016)</li> </ul> |
|                                                                  | <b>Other References</b>                                                                                             | Singh, S. K., and Sanjay Gupta. <i>Entrepreneurship: E-book</i> . SBPD Publications, 2016.                                                                                                                                                   |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://guides.erau.edu/entrepreneurship/websites">https://guides.erau.edu/entrepreneurship/websites</a>                                                                                                                            |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                       |
|                                                                  | <b>Devices/Instruments</b>                                                                                          | Data-show and Laptop                                                                                                                                                                                                                         |

|                                                                          |                                |                 |
|--------------------------------------------------------------------------|--------------------------------|-----------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Supplies</b>                | White board     |
|                                                                          | <b>Electronic Programs</b>     | Microsoft teams |
|                                                                          | <b>Skill Labs/ Simulators</b>  | <b>NA</b>       |
|                                                                          | <b>Virtual Labs</b>            | <b>NA</b>       |
|                                                                          | <b>Other (to be mentioned)</b> | <b>NA</b>       |

|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                          |
|------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr. Moataz Mohamed Abd El-Raouf                                                   | <b>Dr. Mohamed Ashraf</b>                                                           |
| <b>Signature</b> |  |  |

|                                                                               |                                                                                     |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Higher Technological Institute (HTI) – 10<sup>th</sup> of Ramadan City</b> |  |
| <b>Course Specification</b>                                                   |                                                                                     |

## 1. Basic Information

|                                                                                                                 |                                                                                                                                                                                                        |                  |                         |              |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Environmental Impacts of Projects</b>                                                                                                                                                               |                  |                         |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MNG 202</b>                                                                                                                                                                                         |                  |                         |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Chemical Engineering Dept.</b>                                                                                                                                                                      |                  |                         |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw): <b>1</b>                        | <b>Theoretical</b>                                                                                                                                                                                     | <b>Practical</b> | <b>Other (Tutorial)</b> | <b>Total</b> |
|                                                                                                                 | <b>1</b>                                                                                                                                                                                               | <b>-</b>         | <b>-</b>                | <b>1</b>     |
| <b>Course Type:</b>                                                                                             | <b>Compulsory</b>                                                                                                                                                                                      |                  |                         |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                                                                                                                                                                                        |                  |                         |              |
| <b>Academic Program:</b>                                                                                        | <b>All Programs</b>                                                                                                                                                                                    |                  |                         |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>                                                                                                                                                                  |                  |                         |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Ass Prof / Soad Abdel Aziz El Metwaly</b>                                                                                                                                                           |                  |                         |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The updated course specification has been reviewed and approved by the chemical Engineering department council No. (11). Please find attached the corresponding minute confirming the course approval. |                  |                         |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>8/5/2025</b>                                                                                                                                                                                        |                  |                         |              |

## 2. Course Overview (Brief summary of scientific content):

Introduction: Availability of natural resources, Natural cycles of some basic elements (carbon, oxygen, nitrogen, sulfur, Phosphorous) Conflicts between developments, Economics and environments. Defining emissions sources, impacts, standards and precautions. Water, air and soil pollution and measurements. Historical development for recognizing the need for environmental impact assessment. Assessing the impacts on health, social, cultural and economic activities. Procedures of the environmental impact assessment: screening, scoping, defining impacts, comparing alternatives, plans for mitigation and alleviation, environmental auditing and public participation. Environmental impact statement and reporting, contents and forms. Examples for assessing the impacts of water resources projects on the environment and impacts of different activities on the water environment

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                    | Course Learning Outcomes                                    |                                                                                                                        |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| (A3, A4, A6)                                                              |                                                                                                                                                                                                                                                                                                                    | Upon completion of the course, the student will be able to: |                                                                                                                        |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                               | Code                                                        | Text                                                                                                                   |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development | LO1                                                         | Define the steps of EIA study and its objectives, also the structure of the final EIA report                           |
|                                                                           |                                                                                                                                                                                                                                                                                                                    | LO2                                                         | Explain the different types of pollution and environmental component analysis                                          |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles                                                                                                                                        | LO3                                                         | Realize the natural cycles of essential elements and the conflicts between development, economics, and the environment |
|                                                                           |                                                                                                                                                                                                                                                                                                                    | LO4                                                         | Recognize qualitative and quantitative methods of impact analysis.                                                     |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                           | LO5                                                         | Predict EIA for different projects                                                                                     |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology- Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|-------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                       | Virtual labs | E-Learning | AI in Education |
| √                  |                      |                      |                        | √          |                       | √                  | √          |                |            |               |                    |                                           |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)    | Total Weekly Hours | Expected number of the Learning Hours |          |                 |                                           |
|----------|--------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|-------------------------------------------|
|          |                                                        |                    | Theoretical teaching (lectures)       | Training |                 | Other (Tasks/ Assignments/ Projects/ ...) |
|          |                                                        |                    |                                       | Tutorial | Practical / Lab |                                           |
| 1        | Course Introduction<br>Natural cycles of some elements | 1                  | 1                                     | -        | -               |                                           |
| 2        | Types of pollution and measurements.                   | 1                  | 1                                     | -        | -               |                                           |
| 3        | Emissions sources                                      | 1                  | 1                                     | -        | -               |                                           |
| 4        | EIA process                                            | 1                  | 1                                     | -        | -               |                                           |
| 5        | Quiz 1- EIA Report                                     | 1                  | 1                                     | -        | -               |                                           |
| 6        | EIA Report (continued)                                 | 1                  | 1                                     | -        | -               |                                           |
| 7        | Revision and Mid Exam                                  |                    |                                       |          |                 |                                           |
| 8        | Impact Identification                                  | 1                  | 1                                     | -        | -               |                                           |
| 9        | Impact Identification                                  | 1                  | 1                                     | -        | -               |                                           |

|              |                                           |   |   |   |   |  |
|--------------|-------------------------------------------|---|---|---|---|--|
| <b>10</b>    | Review and licensing                      | 1 | 1 | - | - |  |
| <b>11</b>    | Quiz 2 - Review and licensing (continued) | 1 | 1 | - | - |  |
| <b>12</b>    | Monitoring and Auditing                   | 1 | 1 | - | - |  |
| <b>13</b>    | Monitoring and Auditing (continued)       | 1 | 1 | - | - |  |
| <b>14</b>    | Case Study                                | 1 | 1 | - | - |  |
| <b>15,16</b> | <b>Final Exam.</b>                        |   |   |   |   |  |

## 5. Methods of Students' Assessment

| <b>No.</b> | <b>Assessment Methods *</b>       | <b>Assessment Timing (Week Number)</b> | <b>Marks/ Scores</b> | <b>Percentage of total course Marks</b> |
|------------|-----------------------------------|----------------------------------------|----------------------|-----------------------------------------|
| <b>1</b>   | Exam 1 written (Semester work)    | According to schedule                  | 15                   | 15%                                     |
| <b>2</b>   | Exam 2 written (Semester work)    | According to schedule                  | 15                   | 15%                                     |
| <b>3</b>   | Midterm exam                      | 7                                      | 20                   | 20%                                     |
| <b>4</b>   | Final Written Exam                | 15, 16                                 | 40                   | 40%                                     |
| <b>5</b>   | Assignments / Reports /case study | According to schedule                  | 10                   | 10%                                     |

## 6. Learning Resources and Supportive Facilities: \*

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>John Glasson, Riki Therivel and Andrew Chadwick, Introduction to Environmental Impact Assessment, 4th edition, 2012.</li> </ul>                                                                                                                                                                                                                                                  |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Thom B. Fischer, "Strategic Environmental Assessment in Transport and Land Use Planning", 1<sup>st</sup> edition, 2023,</li> <li>Barbara Carroll, Josh Fothergill, Jo Murphy, and Trevor Turpin, "Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities", Third edition, 2019</li> <li>Peter Morris and Riki Therivel,</li> </ul> |

|                                                                          |                                                    |                                                                        |
|--------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------|
|                                                                          |                                                    | <b>Methods of Environmental Impact Assessment, Third edition, 2009</b> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | --                                                                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | <b>EKB - Microsoft Office</b>                                          |
|                                                                          |                                                    |                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | <b>Data show, laptop,</b>                                              |
|                                                                          | <b>Supplies</b>                                    | <b>Essential Supplies</b>                                              |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                     |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                     |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                     |
|                                                                          | <b>Other (to be mentioned)</b>                     | <b>Library Usage</b>                                                   |

|                  |                                         |                              |
|------------------|-----------------------------------------|------------------------------|
|                  | <b>Course Coordinator</b>               | <b>Program Coordinator</b>   |
| <b>Name</b>      | Ass. Prof. Soad Abd El.aziz El Metwally | Dr. Noha Fawzy M. El Hussein |
| <b>Signature</b> | <i>Soad Abdel Aziz Awad</i>             | <i>Noha El Hussein</i>       |



|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |             |      |      |                                                                 |
|----------------------------|-------------|------|------|-----------------------------------------------------------------|
| اخلاقيات مهنية             |             |      |      | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| MNG 203                    |             |      |      | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| الهندسة الطبية             |             |      |      | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| إجمالي                     | أخرى (تحدد) | عملي | نظري | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 1                          |             |      | 1    |                                                                 |
| اجباري                     |             |      |      | نوع المقرر:                                                     |
| SENIOR 1                   |             |      |      | المستوى الدراسي الذي قدم فيه المقرر:                            |
| البرامج الهندسية           |             |      |      | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |             |      |      | المعهد:                                                         |
| ا.م.د/ امل الدسوقي         |             |      |      | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |             |      |      | جهة مناقشة واعتماد تقرير المقرر:                                |
| 8/12/2025                  |             |      |      | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

رؤية عالمية حول علم الهندسة ووظيفة المهندس: لطالما كان علم الهندسة نبزاً أساسياً لأي حضارة. - تُعد مهنة الهندسة من أرقى وأسمى المهن (وظيفة هندسية قائمة على الإبداع والابتكار والتطوير من وحي خيال المهندس - خدمة البشرية جمعاء والسعي إلى الجودة في حياة الإنسان). مسؤولية المهندس على الصعيدين الوطني والدولي: الدور الحيوي للمهندس وفقاً لعقود الهندسة الدولية (فيديك). - مسؤولية المهندس وفقاً للقوانين المصرية. أخلاقيات وآداب المهنة: رؤية عالمية حول قانون نقابة المهندسين رقم 66.

## 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| مخرجات البرنامج / المعايير الأكاديمية المتنبئة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج) |                                                                                                                                                                                                                                            | نواتج التعلم للمقرر                            |                                                                                                          |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| A9, A10                                                                                                 |                                                                                                                                                                                                                                            | عند الانتهاء من المقرر سيكون الطالب قادراً على |                                                                                                          |
| الكود                                                                                                   | النص                                                                                                                                                                                                                                       | الكود                                          | النص                                                                                                     |
| A9                                                                                                      | استخدم التفكير الإبداعي والمبتكر والمرن، واكتسب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها.<br>استخدم التفكير الإبداعي والمبتكر والمرن، واكتسب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها. | LO1                                            | يوضح طبيعة وظيفة المهندس كدور مهني يجمع بين الإبداع والمسؤولية الاجتماعية.                               |
| A10                                                                                                     | اكتسب وطبق معارف جديدة، ومارس استراتيجيات التعلم الذاتي، والتعلم مدى الحياة، وغيرها.                                                                                                                                                       | LO2                                            | يميز بين المسؤوليات المهنية للمهندس في السياق المحلي والدولي، بما في ذلك عقود الفيديك والقوانين المصرية. |

#### 4 طرق التعليم والتعلم للمقرر:

| استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                   |                    |                           | التدريس الغير مباشر |               |                    |                  |                  |                         |             |                         | التدريس المباشر                      |              |                           |           |
|------------------------------------------------|-------------------|--------------------|---------------------------|---------------------|---------------|--------------------|------------------|------------------|-------------------------|-------------|-------------------------|--------------------------------------|--------------|---------------------------|-----------|
| النقاء الإصطناعي في التعليم                    | التعلم الإلكتروني | المعامل الافتراضية | برامج المحاكاة أو النمذجة | التعلم بالإنكتشاف   | التعلم الذاتي | الزيارات الميدانية | التدريب الميداني | الحوار والمناقشة | كتابة التقارير /الأبحاث | حل المشكلات | استراتيجية دراسة الحالة | التعلم القائم على المشروعات الجماعية | العصف الذهني | التمارين العملية والتجارب | المحاضرات |
|                                                | ✓                 |                    |                           |                     | ✓             |                    |                  | ✓                | ✓                       | ✓           |                         | ✓                                    | ✓            |                           | ✓         |

## الجدول الدراسي المقرر:

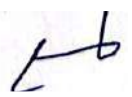
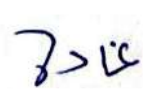
| عدد ساعات التعلم المتوقعة          |        | إجمالي عدد<br>الساعات<br>الأسبوعية | المحتوى العلمي للمقرر<br>(موضوعات المقرر) | رقم<br>الاسبوع<br>الدراسي |                                                                                        |
|------------------------------------|--------|------------------------------------|-------------------------------------------|---------------------------|----------------------------------------------------------------------------------------|
| تدريب                              |        |                                    |                                           |                           |                                                                                        |
| عملي                               | تمارين |                                    |                                           |                           |                                                                                        |
| 0                                  | 0      | 1                                  | 1                                         | 1                         | رؤية عالمية حول علوم الهندسة ومهنة المهندس.                                            |
| 0                                  | 0      | 1                                  | 1                                         | 2                         | رؤية عالمية حول مهنة المهندس.                                                          |
| 0                                  | 0      | 1                                  | 1                                         | 3                         | وظيفة هندسية قائمة على الإبداع والابتكار.                                              |
| 0                                  | 0      | 1                                  | 1                                         | 4                         | وظيفة هندسية قائمة على التطوير.                                                        |
| 0                                  | 0      | 1                                  | 1                                         | 5                         | دور المهندس الحيوي في العقود الهندسية الدولية.                                         |
| 0                                  | 0      | 1                                  | 1                                         | 6                         | مسؤولية المهندس في القوانين المصرية.                                                   |
| مراجعة وامتحان منتصف الفصل الدراسي |        |                                    |                                           |                           | 7                                                                                      |
| 0                                  | 0      | 1                                  | 1                                         | 8                         | معرفة بالاتحاد الدولي للمهندسين الاستشاريين (فيديك).                                   |
| 0                                  | 0      | 1                                  | 1                                         | 9                         | أخلاقيات وآداب المهنة: رؤية عالمية حول قانون نقابة المهندسين رقم 66 لسنة 1974 - تأكيد. |
| 0                                  | 0      | 1                                  | 1                                         | 10                        | مراجعة واختبار قصير.                                                                   |
| 0                                  | 0      | 1                                  | 1                                         | 11                        | معرفة بالاتحاد الدولي للمهندسين الاستشاريين (فيديك).                                   |
| 0                                  | 0      | 1                                  | 1                                         | 12                        | أخلاقيات وآداب المهنة: رؤية عالمية حول قانون نقابة المهندسين رقم 66 لسنة 1974 - تأكيد. |
| 0                                  | 0      | 1                                  | 1                                         | 13                        | مناقشة التقارير                                                                        |
| 0                                  | 0      | 1                                  | 1                                         | 14                        |                                                                                        |
| إختبارات الفصل الدراسي النهائية    |        |                                    |                                           |                           | 16-15                                                                                  |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *                                | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|----------------------------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة)                  | 10                                                | 20            | 20 %                                    |
| 3 | امتحان منتصف الفصل الدراسي                   | 7                                                 | 20            | 20 %                                    |
| 4 | امتحان نهائي تحريري                          | 15 و 16                                           | 40            | 40 %                                    |
| 7 | تكاليفات / مشروع / ملف الإنجاز /كتيب الانشطة | 13 و 14                                           | 20            | 20 %                                    |

## 6- مصادر التعلم والتسهيلات المادية:

|                                                                              |                                                                                 |                                                         |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|
| Mappes, Thomas A. Biomedical Ethics. 1st ed.,<br>Butterworth, 1999           | المرجع الأساسي للمقرر<br>(لابد من كتابة البيانات كاملة وفقاً لطريقة توثيق علمي) | مصادر التعلم<br>(الكتب والمراجع<br>العلمية وغيرها)<br>* |
| السامرائي، مهدي صالح مهدي. أخلاقيات العمل. دار صفاء<br>للنشر والتوزيع، 2021. | المراجع الأخرى                                                                  |                                                         |
| <a href="#">اخلاقيات العمل - د. مهدي صالح مهدي السامرائي - Google Books</a>  | المصادر الإلكترونية<br>(لابد من إضافة الروابط)                                  |                                                         |
| EKB - Microsoft office                                                       | المنصة التعليمية<br>(لابد من إضافة الرابط)                                      |                                                         |
| Data show                                                                    | الأجهزة                                                                         | التجهيزات<br>التعليمية<br>المساندة للتعليم<br>والتعلم * |
|                                                                              | المستلزمات                                                                      |                                                         |
|                                                                              | البرامج الإلكترونية                                                             |                                                         |
|                                                                              | معامل المهارات/ المحاكيات                                                       |                                                         |
|                                                                              | المعامل الافتراضية                                                              |                                                         |
|                                                                              | أخرى (تذكر)                                                                     |                                                         |

| منسق المقرر                                                                          | منسق البرنامج                                                                       |         |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|
| أ.م.د/ أمل الدسوقي                                                                   | د/ غادة كريم                                                                        | الإسم   |
|  |  | التوقيع |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |                 |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|-----------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Scientific Thinking</b>                |                  |                        |                 |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b><u>HUM 207</u></b>                     |                  |                        |                 |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |                 |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b>    |
|                                                                                                                 | <b><u>2</u></b>                           |                  |                        | <b><u>2</u></b> |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |                 |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |                 |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |                 |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |                 |
| <b>Name of Course Coordinator:</b>                                                                              | Dr./ Mustafa Muhammad Fadel               |                  |                        |                 |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |                 |
| <b>Course Specification Approval Date:</b>                                                                      | <b><u>7/26/2025</u></b>                   |                  |                        |                 |

## 2. Course Overview (Brief summary of scientific content):

The course trains students to think logically and critically and helps them to adapt and integrate in an academic environment. The student is familiarized with methods of researching and accessing information through the library or the Internet and is trained to assess the content and sources of information, reporting, and citing scientific literature, and how to maintain high ethical standards.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                               | Course Learning Outcomes                                    |                                                                                                         |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| (A1, A4, A5, A7, A8)                                                      |                                                                                                                                                                               | Upon completion of the course, the student will be able to: |                                                                                                         |
| Code                                                                      | Text                                                                                                                                                                          | Code                                                        | Text                                                                                                    |
| A1                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.                                             | LO 1                                                        | Identify the main steps of logically and critically scientific thinking.                                |
|                                                                           |                                                                                                                                                                               | LO 2                                                        | Formulate the principal methods of researching and accessing                                            |
|                                                                           |                                                                                                                                                                               | LO 3                                                        | Rationalize the logic scientific thinking and unlogic scientific thinking.                              |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles. | LO 4                                                        | Utilize the principal methods of researching and accessing information through the library.             |
|                                                                           |                                                                                                                                                                               | LO 5                                                        | Evaluate the environmental issues, and risk management principles.                                      |
|                                                                           |                                                                                                                                                                               | LO 6                                                        | Assess the standard rules of researching and its quality guidelines for health and safety requirements. |
| A5                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                    | LO 7                                                        | Implement scientific reports depending on the scientific foundations of his study.                      |
|                                                                           |                                                                                                                                                                               | LO 8                                                        | Control the time planning and team integration.                                                         |
| A7                                                                        | Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.                                                                         | LO 9                                                        | Transfer the gained knowledge orally, written, and graphically.                                         |
|                                                                           |                                                                                                                                                                               | LO 10                                                       | Acquire the ability to self-learn in engineering applications related to scientific thinking.           |
| A8                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                                                          | LO 1                                                        | Obtain the steps of logically and critically scientific thinking.                                       |
|                                                                           |                                                                                                                                                                               | LO 2                                                        | acquaint the methods of researching and accessing information through the library or the Internet.      |
|                                                                           |                                                                                                                                                                               | LO 3                                                        | assess the content and sources of information, reporting, and citing scientific literature              |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    |                        | √          | √                     | √                  | √          | √              | √          | √             | √                  |                                          |              | √          | √               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                          | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                              |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                              |                    |                                       | Tutorial | / Practical Lab |
| 1        | The main steps of logically and critically scientific thinking                               | 2                  | 2                                     | 0        | 0               |
| 2        | Factors that affect scientific and innovative thinking, such as the surrounding environment. | 2                  | 2                                     | 0        | 0               |
| 3        | The principal methods of researching and accessing information through the library.          | 2                  | 2                                     | 0        | 0               |
| 4        | The techniques of researching through the Internet.                                          | 2                  | 2                                     | 0        | 0               |
| 5        | Evaluating the information and results with academic environment research.                   | 2                  | 2                                     | 0        | 0               |
| 6        | The methods of presentations to show the findings of scientific research                     | 2                  | 2                                     | 0        | 0               |

|    |                                                                                               |   |   |   |   |
|----|-----------------------------------------------------------------------------------------------|---|---|---|---|
| 7  | <b>Revision and Mid Exam</b>                                                                  |   |   |   |   |
| 8  | <b>Scientific analysis and linking between variables</b>                                      | 2 | 2 | 0 | 0 |
| 9  | <b>Suggest scientific solutions to practical problems</b>                                     | 2 | 2 | 0 | 0 |
| 10 | <b>levels of thinking and scientific thinking techniques</b>                                  | 2 | 2 | 0 | 0 |
| 11 | <b>Ethical standards of scientific research.</b>                                              | 2 | 2 | 0 | 0 |
| 12 | <b>The impact of innovative thinking on management in organizations and change management</b> | 2 | 2 | 0 | 0 |
| 13 | <b>Final Exam.</b>                                                                            |   |   |   |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            |                                 | <b>10</b>     | <b>10 %</b>                      |
| 2   | Exam 2 written (Semester work)            |                                 | <b>10</b>     | <b>10 %</b>                      |
| 3   | Midterm exam                              |                                 | <b>20</b>     | <b>20 %</b>                      |
| 4   | Final Written Exam                        |                                 | <b>40</b>     | <b>40 %</b>                      |
| 5   | Final Oral Exam                           |                                 | <b>10</b>     | <b>10 %</b>                      |
| 6   | Assignments / Project /Portfolio/ Logbook |                                 | <b>10</b>     | <b>10 %</b>                      |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <b>Available Presentation (handed to students' part by part).</b>                                                                                                                                                                                                                                                                                                                                                  |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Michael E Gorman; "Scientific and Technological Thinking" 2005 by Lawrence Erlbaum Associates</li> <li>• Richard Paul, Linda Elder: The Miniature Guide to Scientific Thinking; 2023</li> </ul>                                                                                                                                                                           |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>• <a href="https://www.youtube.com/watch?v=pOb_jKqy_s0&amp;ab_channel=Flippin%27ScienceVideos">https://www.youtube.com/watch?v=pOb_jKqy_s0&amp;ab_channel=Flippin%27ScienceVideos</a></li> <li>• <a href="https://study.com/learn/lesson/scientific-thinking-process-examples.html">https://study.com/learn/lesson/scientific-thinking-process-examples.html</a></li> </ul> |



|                                                                          |                                                    |                        |
|--------------------------------------------------------------------------|----------------------------------------------------|------------------------|
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | --                     |
|                                                                          | <b>Supplies</b>                                    |                        |
|                                                                          | <b>Electronic Programs</b>                         |                        |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | x                      |
|                                                                          | <b>Virtual Labs</b>                                | x                      |
|                                                                          | <b>Other</b> (to be mentioned)                     | x                      |

|                  | <b>Course Coordinator</b>     | <b>Program Coordinator</b>                                                          |
|------------------|-------------------------------|-------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr./ Mustafa Muhammad Fadel   | Prof. Ahmed Abd El-Gafar                                                            |
| <b>Signature</b> | <i>Mustafa Muhammad Fadel</i> |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Business Administration</b>            |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>HUM 208</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  |                  |                        | <b>2</b>     |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b><u>Prof. Eid Abd El-Baset Eid</u></b>  |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Nature, scope, importance & characteristics of business administration, development of the managerial thought, business external & internal environments, types of institutions, the managerial process. Functions of management: planning: planning concepts & importance, types of plans, characteristics & contents of the plan, planning stages, budgeting for planning. Organization: organization concepts & importance, characteristics of good & effective organization, types of organization structures, centralization & decentralization, span of supervision, delegation of authority, integration among the different units in the organization. Direction & supervision: Motivation, communications leadership & its different types. Control: concept & importance of control, control steps, objectives, actual performance, the deviation,

reasons of the deviation, the corrective actions, types of control, internal & external control. Decision - Making: Types of administrative decisions, decision -making process & steps, importance of information of decision making. Major functions in different companies: production, marketing, finance, human resources.

### **3. Course Learning Outcomes CLOs :**

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

| <b>Program Outcomes (NARS/ARS)</b><br>(according to the matrix in the program specs) |                                                                                                                      | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(A7, A8, A10)</b>                                                                 |                                                                                                                      | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                                                                                                                                                                         |
| <b>Code</b>                                                                          | <b>Text</b>                                                                                                          | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                                                                                                                                                                             |
| <b>A7</b>                                                                            | Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.                | <b>LO1</b>                                                         | <b>Describe the main steps of strategic plans using marketing information</b>                                                                                                                                                                                                                                                           |
|                                                                                      |                                                                                                                      | <b>LO2</b>                                                         | <b>Understand the role of information technology systems (IT) in supporting business operations..</b>                                                                                                                                                                                                                                   |
| <b>A8</b>                                                                            | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools. | <b>LO3</b>                                                         | <b>Elucidate the principal of Functions of management: planning: planning concepts &amp; importance, types of plans, characteristics &amp; contents of the plan, planning stages, budgeting for planning.</b>                                                                                                                           |
|                                                                                      |                                                                                                                      | <b>LO4</b>                                                         | <b>Explicate the fundamentals of organization work: organization concepts &amp; importance, characteristics of good &amp; effective organization, types of organization structures, centralization &amp; decentralization, span of supervision, delegation of authority, integration among the different units in the organization.</b> |
|                                                                                      |                                                                                                                      | <b>LO5</b>                                                         | <b>Evaluating between Direction &amp; supervision: Motivation, communications leadership &amp; its different types.</b>                                                                                                                                                                                                                 |
| <b>A10</b>                                                                           | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies..                         | <b>LO6</b>                                                         | <b>Assess the Control: concept &amp; importance of control, control steps, objectives, actual performance, the deviation, reasons of the deviation, the corrective actions, types of control, internal &amp; external control.</b>                                                                                                      |
|                                                                                      |                                                                                                                      | <b>LO7</b>                                                         | <b>Evaluate the decision Making: Types of administrative decisions, decision -making process &amp; steps, importance of information of decision making.</b>                                                                                                                                                                             |
|                                                                                      |                                                                                                                      | <b>LO8</b>                                                         | <b>Identify the major functions in different companies: production, marketing, finance, human resources.</b>                                                                                                                                                                                                                            |
|                                                                                      |                                                                                                                      | <b>LO9</b>                                                         | <b>Maintain the high ethical standards of business work.</b>                                                                                                                                                                                                                                                                            |

|  |  |      |                                      |
|--|--|------|--------------------------------------|
|  |  | LO10 | Explain the gained knowledge orally. |
|--|--|------|--------------------------------------|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)         | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                             |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                             |                    |                                       | Tutorial | / Practical Lab |
| 1        | An overview of the administrative process.                  | 2                  | 2                                     | 0        | 0               |
| 2        | The nature of the projects and their objectives             | 2                  | 2                                     | 0        | 0               |
| 3        | An overview of management functions and facility functions. | 2                  | 2                                     | 0        | 0               |
| 4        | Factors affecting the performance of the facility.          | 2                  | 2                                     | 0        | 0               |
| 5        | Planning function                                           | 2                  | 2                                     | 0        | 0               |
| 6        | Regulation function                                         | 2                  | 2                                     | 0        | 0               |
| 7        | Revision and Mid Exam                                       |                    |                                       |          |                 |
| 8        | Orientation function                                        | 2                  | 2                                     | 0        | 0               |

|    |                                                              |   |   |   |   |
|----|--------------------------------------------------------------|---|---|---|---|
| 9  | <b>Control function.</b>                                     | 2 | 2 | 0 | 0 |
| 10 | <b>Management levels and skills required for each level.</b> | 2 | 2 | 0 | 0 |
| 11 | <b>Administrative communication process.</b>                 | 2 | 2 | 0 | 0 |
| 12 | <b>Supplementary materials and Quiz</b>                      | 2 | 2 | 0 | 0 |
| 13 | <b>Presentations</b>                                         | 2 | 2 | 0 | 0 |
| 14 | <b>Final Exam.</b>                                           |   |   |   |   |

### 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | QUIZ 1 written (Semester work) | 4                               | 10            | 10%                              |
| 2   | QUIZ 2 written (Semester work) | 11                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15                              | 40            | 40 %                             |
| 5   | Assignments (Report & Sheet)   | 10,12                           | 20            | 20%                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <b>Available Presentation (handed to students' part by part).</b>                                                                                                                                                                                                                                                                  |
|                                                                  | <b>Other References</b>                                                                                             | 1-Mohamed Abdallah Abd El Rehim, Fundamental of Management & Organization, Cairo University.2022<br>2-El Desouky Hamed Abou Zeid, the Scientific Fundamentals of Management, Cairo University.2022                                                                                                                                 |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://www.ecpi.edu/blog/what-is-business-administration-all-about">https://www.ecpi.edu/blog/what-is-business-administration-all-about</a></li> <li><a href="https://www.edx.org/learn/business-administration">https://www.edx.org/learn/business-administration</a></li> </ul> |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                             |
| <b>Supportive facilities &amp;</b>                               | <b>Devices/Instruments</b>                                                                                          | <b>Notebook and data show equipped lecture room.</b>                                                                                                                                                                                                                                                                               |

|                                                   |                                |                                                      |
|---------------------------------------------------|--------------------------------|------------------------------------------------------|
| equipment<br>for<br>teaching<br>and<br>learning * | <b>Supplies</b>                | <b>Teaching aids and computers.</b>                  |
|                                                   | <b>Skill Labs/ Simulators</b>  |                                                      |
|                                                   | <b>Other</b> (to be mentioned) | <b>Notebook and data show equipped lecture room.</b> |

|                  |                            |                                                                                     |
|------------------|----------------------------|-------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>  | <b>Program Coordinator</b>                                                          |
| <b>Name</b>      | Prof. Eid Abd El-Baset Eid | Prof. Ahmed Abd El-Gafar                                                            |
| <b>Signature</b> | Prof. Eid Abd El-Baset Eid |  |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |             |      |      |                                                                 |
|----------------------------|-------------|------|------|-----------------------------------------------------------------|
| تربية رياضية 3             |             |      |      | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| PHE 201                    |             |      |      | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |             |      |      | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| إجمالي                     | أخرى (تحدد) | عملي | نظري | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 1                          |             | 1    | 2    |                                                                 |
| اجباري                     |             |      |      | نوع المقرر:                                                     |
| SENIOR 1                   |             |      |      | المستوى الدراسي الذي قدم فيه المقرر:                            |
| البرامج الهندسية           |             |      |      | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |             |      |      | المعهد:                                                         |
| د/ خلود فاروق حامد         |             |      |      | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |             |      |      | جهة مناقشة واعتماد تقرير المقرر:                                |
| 7/26/2025                  |             |      |      | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

الهندسة الرياضية: المعدات الحديثة للتربية البدنية وعلاقتها باختيار الرياضيين، تحليل الحركة والتقييم والقياس الفسيولوجي، المعدات الحديثة وعلاقتها باختيار الرياضيين، معالجة مياه حمامات السباحة، أبعاد الملاعب، الاختلافات الفسيولوجية خلال مزاولة الرياضة وتأثيرها على الملابس الرياضية. مقدمة في علم النفس الرياضي، تعريف علم النفس الرياضي، والدافع، والقلق، والتدريب العقلي، والاسترخاء، التصور العقلي، واستخدام أجهزة الكمبيوتر في قياس الحالة النفسية، العلاقة بين علم النفس الرياضي والهندسة الرياضية

## 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج) |                                                                                                                                       | نواتج التعلم للمقرر                            |                                                            |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------|
| A4, A5, A7, A8, A9                                                                                      |                                                                                                                                       | عند الانتهاء من المقرر سيكون الطالب قادراً على |                                                            |
| الكود                                                                                                   | النص                                                                                                                                  | الكود                                          | النص                                                       |
| A4                                                                                                      | الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر. | LO1                                            | التعرف على الكفاءة الهوائية وقدراتها وأنواعها              |
|                                                                                                         |                                                                                                                                       | LO2                                            | معرفة بعض الأسس الخاصة بالكفاءة الهوائية                   |
|                                                                                                         |                                                                                                                                       | LO3                                            | تنمية المعرفة ببعض المصطلحات الخاصة بالهندسة والرياضة      |
| A5                                                                                                      | ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.                                                                          | LO4                                            | معرفة الاختبارات والمعايير الخاصة بالكفاءة الهوائية        |
|                                                                                                         |                                                                                                                                       | LO5                                            | التعرف على العمل العضلي اللاهوائي وأنواع القدرات الخاصة به |
| A7                                                                                                      | العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعدد الثقافات                                                                         | LO6                                            | التعرف على العجز الأكسجيني والدين الأكسجيني وأنواعهما      |
|                                                                                                         |                                                                                                                                       | LO7                                            | التعرف على الهندسة الرياضية وأهميتها وأهدافها              |
| A8                                                                                                      | لتواصل بفعالية ببياناً وشفاهة وكتابة مع مجموعات من الجماهير باستخدام الأدوات العصرية.                                                 | LO8                                            | تنمية معرفته بأنواع العضلات والانقباض العضلي               |
| A9                                                                                                      | إستخدام التفكير الإبداعي والمبتكر والمرن واكتساب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها                   | LO9                                            | زيادة معرفة الطالب بالأجهزة الرياضية الحديثة واستخداماتها  |
|                                                                                                         |                                                                                                                                       | LO10                                           | تطوير الأجهزة بما يتناسب مع التقنيات الحديثة               |

#### 4 طرق التعليم والتعلم للمقرر:

| استراتيجيات التعلم بمساعدة تكنو<br>لوجيا المعلومات |                   |                    |                           | التدريس الغير مباشر |               |                    |                  |                  |                         |             |                         | التدريس<br>المباشر                   |              |                           |           |
|----------------------------------------------------|-------------------|--------------------|---------------------------|---------------------|---------------|--------------------|------------------|------------------|-------------------------|-------------|-------------------------|--------------------------------------|--------------|---------------------------|-----------|
| النماء الإصطناعي في التعليم                        | التعلم الالكتروني | المعامل الافتراضية | برامج المحاكاة أو النمذجة | التعلم بالإكتشاف    | التعلم الذاتي | الزيارات الميدانية | التدريب الميداني | الحوار والمناقشة | كتابة التقارير /الأبحاث | حل المشكلات | استراتيجية دراسة الحالة | التعلم القائم على المشروعات الجماعية | العصف الذهني | التمارين العملية والتجارب | المحاضرات |
|                                                    | ✓                 |                    |                           |                     | ✓             |                    |                  | ✓                | ✓                       |             |                         |                                      | ✓            | ✓                         | ✓         |



## الجدول الدراسي للمقرر:

| رقم<br>الأسبوع<br>الدراسي | المحتوى العلمي للمقرر<br>(موضوعات المقرر)                                                                          | إجمالي<br>عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم<br>المتوقعة |       |
|---------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------|-------|
|                           |                                                                                                                    |                                       | تدريس<br>نظري                | تدريب |
|                           |                                                                                                                    |                                       |                              |       |
| 1                         | المقدمة ومفهوم عن علم الهندسة الرياضية /هدفها /اهميتها<br>+ تدريبات على اللياقة البدنية                            | 2                                     | 1                            | 0     |
| 2                         | الكفاءة الهوائية واختباراتها + تدريبات على اللياقة البدنية                                                         | 2                                     | 1                            | 0     |
| 3                         | اسس تنمية الكفاءة الهوائية + تدريبات على اللياقة البدنية                                                           | 2                                     | 1                            | 0     |
| 4                         | الكفاءة اللاهوائية واختباراتها + تدريبات على اللياقة البدنية                                                       | 2                                     | 1                            | 0     |
| 5                         | شروط تنمية التحمل اللاهوائي + تدريبات على اللياقة البدنية                                                          | 2                                     | 1                            | 0     |
| 6                         | علم البيوميكانيك(البيوميكانيك الرياضي بعض المفاهيم<br>والمصطلحات الخاصة بالحركة) + التدريب على<br>اختبارات اللياقة | 2                                     | 1                            | 0     |
| 7                         | مراجعة وامتحان منتصف الفصل الدراسي                                                                                 |                                       |                              |       |
| 8                         | الجهاز الحركي(تركيب العضلة/انواع العضلات)+<br>تدريبات على اللياقة البدنية                                          | 2                                     | 1                            | 0     |
| 9                         | الاعتبارات الخاصة باختيار الموقع (المنشأة الرياضية) +<br>تدريبات على اختبارات اللياقة البدنية                      | 2                                     | 1                            | 0     |
| 10                        | الاشتراطات العامة لتصميم المنشآت الرياضية + تدريبات<br>على اختبارات اللياقة البدنية                                | 2                                     | 1                            | 0     |
| 11                        | التقنيات الحديثة في معالجة المياه + تدريبات على اللياقة<br>البدنية                                                 | 2                                     | 1                            | 0     |
| 12                        | علم النفس الرياضي (الاجهزة الحديثة للتدريب العقلي) +<br>تدريبات على اللياقة البدنية                                | 2                                     | 1                            | 0     |
| 13                        | إختبارات الفصل الدراسي النهائية عملي                                                                               |                                       |                              |       |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *              | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|----------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | بحث تقييمي للشق العملي     | 4                                                 | 20            | 20%                                     |
| 2 | امتحان منتصف الفصل الدراسي | 7                                                 | 20            | 20 %                                    |
| 3 | امتحان نهائي تحريري        | 13_14                                             | 30            | 30 %                                    |
| 4 | امتحان نهائي عملي          | 13                                                | 30            | 30%                                     |

## 6- مصادر التعلم والتسهيلات المادية:

|                                                                                                                                                                                                                    |                                                                                 |                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|
| التطور التقني ودوره في المجال الرياضي صبري عمر_زكي<br>حسن دار المعرفة 2020م                                                                                                                                        | المرجع الأساسي للمقرر<br>(لا بد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي) | مصادر التعلم<br>(الكتب والمراجع<br>العلمية وغيرها)<br>* |
| طببيقات البيوميكانيك في التدريب والاداء صريح عبد الكريم دار<br>دجلة الطبعة الاولى 2019م                                                                                                                            | المراجع الأخرى                                                                  |                                                         |
| <ul style="list-style-type: none"> <li>• <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a></li> <li>• <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a></li> </ul> | المصادر الالكترونية<br>(لا بد من إضافة الروابط)                                 |                                                         |
| EKB - Microsoft office                                                                                                                                                                                             | المنصة التعليمية<br>(لا بد من إضافة الرابط)                                     |                                                         |
| قاعة محاضرات مجهزة .                                                                                                                                                                                               | 1                                                                               | التجهيزات<br>التعليمية<br>المساندة للتعليم<br>والتعلم * |
| المكتبات المركزية والفرعية.                                                                                                                                                                                        | 2                                                                               |                                                         |
| الوسائل التعليمية (داتا شو) وجهاز كمبيوتر محمول.                                                                                                                                                                   | 3                                                                               |                                                         |
| مذكرة لتدريس المقرر وكشوف متابعة للطلاب                                                                                                                                                                            | 4                                                                               |                                                         |

| منسق البرنامج                                                                      | منسق المقرر       |         |
|------------------------------------------------------------------------------------|-------------------|---------|
| إ.د/ أحمد عبد الغفار                                                               | د.خلود فاروق حامد | الإسم   |
|  | خلود فاروق حامد   | التوقيع |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Introduction to Accounting</b>         |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>HUM 201</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Basic Sciences</b>                     |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <u>2</u>                                  |                  |                        | <u>2</u>     |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <u><b>ALL ENGINEERING PROGRAMS</b></u>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              |                                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <u><b>7/26/2025</b></u>                   |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

The scientific frame of accounting: accounting concept & objectives, acceptable principles of accounting, accounting branches, types of institutions - financial statement: balance sheet, income statement, ownership proprietary statement, cash flows statement - double entry & analysis of financial transactions: accounting continuous balance of the financial position formula, debit & credit items financial position formula – the accounting cycle: business documents, the journals the ledgers' commercial documents according to the Egyptian laws. Journalizing & recording the commercial transactions of the firm, transactions of the owner of the firm, commercial papers & documents different types of revenues & expenditure. Trail Balance: Trail balance concept & objectives, its balance & imbalance corrections in the imbalance cases. A brief presentations of accounting in the types of companies as partnerships, limited partnerships & corporation.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).

| Program Outcomes (NARS/ARS)<br>(according to the matrix in the program specs) |                                                                                                                                               | Course Learning Outcomes                                    |                                                                                                                                                                        |
|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(A6,A8, A9, A10)</b>                                                       |                                                                                                                                               | Upon completion of the course, the student will be able to: |                                                                                                                                                                        |
| Code                                                                          | Text                                                                                                                                          | Code                                                        | Text                                                                                                                                                                   |
| A6                                                                            | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                      | LO1                                                         | Design the presentations of accounting in she types of companies as partnerships, limited partnerships & corporation.                                                  |
| A8                                                                            | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                          | LO2                                                         | Interpret the main concepts of basic financial accounting.                                                                                                             |
|                                                                               |                                                                                                                                               | LO3                                                         | Infer the main principle of basic financial statements.                                                                                                                |
|                                                                               |                                                                                                                                               | LO4                                                         | Elucidate the principal of balance sheet, income statement, ownership proprietary statement, cash flows statement - double entry & analysis of financial transactions. |
| A9                                                                            | Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations. | LO5                                                         | Clarify the accounting continuous balance of the financial position formula, debit & credit items financial position formula.                                          |
|                                                                               |                                                                                                                                               | LO6                                                         | Evaluate the accounting cycle: business documents, the journals the ledgers' commercial documents according to the Egyptian laws.                                      |
| A10                                                                           | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies..                                                  | LO7                                                         | Assess the trail balance concept & imbalance corrections in the imbalance cases.                                                                                       |
|                                                                               |                                                                                                                                               | LO8                                                         | Record the commercial transactions of the firm, transactions of the owner of the firm, commercial papers & documents different types of revenues & expenditure.        |
|                                                                               |                                                                                                                                               | LO9                                                         | Mange as member in a teamwork .                                                                                                                                        |
|                                                                               |                                                                                                                                               | LO10                                                        | Illustrate the gained knowledge orally.                                                                                                                                |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                          | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                              |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                              |                    |                                       | Tutorial | / Practical Lab |
| 1        | Basic concepts of financial accounting in individual projects.                                                               | 2                  | 2                                     | 0        | 0               |
| 2        | Budget equation.                                                                                                             | 2                  | 2                                     | 0        | 0               |
| 3        | Basic financial statements.                                                                                                  | 2                  | 2                                     | 0        | 0               |
| 4        | Double cod theory.                                                                                                           | 2                  | 2                                     | 0        | 0               |
| 5        | Posting for the ledger                                                                                                       | 2                  | 2                                     | 0        | 0               |
| 6        | Inventory adjustments                                                                                                        | 2                  | 2                                     | 0        | 0               |
| 7        | Revision and Mid Exam                                                                                                        |                    |                                       |          |                 |
| 8        | Journalizing & recording the commercial transactions of the firm, transactions of the owner of the firm, commercial papers & | 2                  | 2                                     | 0        | 0               |

|    |                                                                                                                  |   |   |   |   |
|----|------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|    | documents different types of revenues & expenditure                                                              |   |   |   |   |
| 9  | Preparing financial statements (final accounts and budget).                                                      | 2 | 2 | 0 | 0 |
| 10 | Trail Balance: Trail balance concept & objectives, its balance & imbalance corrections in the imbalance cases.   | 2 | 2 | 0 | 0 |
| 11 | A brief presentation of accounting in the types of companies as partnerships, limited partnerships & corporation | 2 | 2 | 0 | 0 |
| 12 | Supplementary Material and Quiz                                                                                  | 2 | 2 | 0 | 0 |
| 13 | Presentations                                                                                                    | 2 | 2 | 0 | 0 |
| 14 | <b>Final Exam.</b>                                                                                               |   |   |   |   |

### 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | QUIZ 1 written (Semester work) | 4                               | 10            | 10%                              |
| 2   | QUIZ 2 written (Semester work) | 11                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15                              | 40            | 40 %                             |
| 5   | Assignments (Report & Sheet)   | 10,12                           | 20            | 20%                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                                  |                                                                                                                     |                                                                                                                                |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <b>Available Presentation (handed to students' part by part).</b>                                                              |
|                                                                  | <b>Other References</b>                                                                                             | <b>Mohamed Sabri El Attar, Mansoura Hamed &amp; Ahmed El-Sabagh, Principles of financial Accounting, Cairo University.2020</b> |

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li>• <a href="https://www.oreilly.com/library/view/financial-accounting-in/9780470635292/ch03sec3.html">https://www.oreilly.com/library/view/financial-accounting-in/9780470635292/ch03sec3.html</a></li> <li>• <a href="https://www.coursera.org/learn/financial-accounting">https://www.coursera.org/learn/financial-accounting</a></li> <li>• <a href="https://open.umn.edu/opentextbooks/textbooks/640/">https://open.umn.edu/opentextbooks/textbooks/640/</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | <b>Notebook and data show equipped lecture room.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                          | <b>Supplies</b>                                    | <b>Teaching aids and computers.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Skill Labs/ Simulators</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                          | <b>Other (to be mentioned)</b>                     | <b>Notebook and data show equipped lecture room.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|                  |                           |                                                                                     |
|------------------|---------------------------|-------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b>                                                          |
| <b>Name</b>      |                           | Prof. Ahmed Abd El-Gafar                                                            |
| <b>Signature</b> |                           |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>English Literature</b>                 |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>HUM 202</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  |                  |                        | <b>2</b>     |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Mai Abouzaid                          |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | <b>7/26/2025</b>                          |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Introduction to the forms of literature, short story, novel, drama and poetry. Developing students' critical ability through carefully selected sample literary texts.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**



| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                              | Course Learning Outcomes                                    |                                                                                                               |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| (A8, A9, A10)                                                             |                                                                                                                                                              | Upon completion of the course, the student will be able to: |                                                                                                               |
| Code                                                                      | Text                                                                                                                                                         | Code                                                        | Text                                                                                                          |
| <b>A8</b>                                                                 | Enhance and Develop the students' abilities and awareness for appropriate analysis and interpretation to all the scientific topics written in English words. | <b>LO1</b>                                                  | Enhance students' abilities in reading English Literature                                                     |
|                                                                           |                                                                                                                                                              | <b>LO2</b>                                                  | Developing reading strategies for different purposes.                                                         |
|                                                                           |                                                                                                                                                              | <b>LO3</b>                                                  | Study different types and genres of English Literature(poetry, novel, drama and short stories).               |
|                                                                           |                                                                                                                                                              | <b>LO4</b>                                                  | Work effectively in team of multi-disciplinary or multi-culture.                                              |
| <b>A9</b>                                                                 | Communicate effectively, verbally and in writing with a range of audiences.                                                                                  | <b>LO5</b>                                                  | Apply the four skills of language freely with particular emphasis on dealing with literary works.             |
| <b>A10</b>                                                                | Acquire and apply new knowledge and practice through English language.                                                                                       | <b>LO6</b>                                                  | Express themselves in English with confidence, especially while evaluating and criticizing the literary work. |
|                                                                           |                                                                                                                                                              | <b>LO7</b>                                                  | Comprehending various texts, including literary and informational materials.                                  |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)  | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                      |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                      |                    |                                       | Tutorial | / Practical Lab |
| 1        | Introduction to Literature, Poetry and Short Stories | 2                  | 2                                     | 0        | 0               |
| 2        | The Necklace by Guy de Maupassant                    | 2                  | 2                                     | 0        | 0               |
| 3        | Nice Girl by Sherwood Anderson                       | 2                  | 2                                     | 0        | 0               |
| 4        | Anton Chekov's Small Fry.                            | 2                  | 2                                     | 0        | 0               |
| 5        | Earnest Hemingway's The Old Man at the Bridge        | 2                  | 2                                     | 0        | 0               |
| 6        | Vendetta by Guy de Maupassant                        | 2                  | 2                                     | 0        | 0               |
| 7        | Revision and Mid Exam                                |                    |                                       |          |                 |
| 8        | Sir Walter Raleigh's poems.                          | 2                  | 2                                     | 0        | 0               |

|    |                                        |   |   |   |   |
|----|----------------------------------------|---|---|---|---|
| 9  | <b>Shakespeare's Poems</b>             | 2 | 2 | 0 | 0 |
| 10 | <b>Christopher Marlowe's Poems</b>     | 2 | 2 | 0 | 0 |
| 11 | <b>Supplementary Material and Quiz</b> | 2 | 2 | 0 | 0 |
| 12 | <b>Supplementary Material and Quiz</b> | 2 | 2 | 0 | 0 |
| 13 | <b>Presentations</b>                   | 2 | 2 | 0 | 0 |
| 14 | <b>Final Exam.</b>                     |   |   |   |   |

### **5- Methods of students' assessment:**

| <b>No.</b> | <b>Assessment Methods *</b>    | <b>Assessment Timing (Week Number)</b> | <b>Marks/ Scores</b> | <b>Percentage of total course Marks</b> |
|------------|--------------------------------|----------------------------------------|----------------------|-----------------------------------------|
| 1          | QUIZ 1 written (Semester work) | <b>4</b>                               | <b>10</b>            | <b>10%</b>                              |
| 2          | QUIZ 2 written (Semester work) | <b>11</b>                              | <b>10</b>            | <b>10%</b>                              |
| 3          | Midterm exam                   | <b>7</b>                               | <b>20</b>            | <b>20 %</b>                             |
| 4          | Final Written Exam             | <b>15</b>                              | <b>40</b>            | <b>40 %</b>                             |
| 5          | Assignments (Report & Sheet)   | <b>10,12</b>                           | <b>20</b>            | <b>20%</b>                              |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                 |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <b>"English Literature"; HTI; Available Hard copy.<br/>Available Presentation (handed to students' part by part).</b>                                                           |
|                                                                  | <b>Other References</b>                                                                                             | <b>1- History of English Literature by Edward Albert. London: Routledge, 2019.<br/><br/>2- Arabic Literature in Translation. Cairo: The American University in Cairo, 2022.</b> |

|                                                                          |                                                    |                                                                                                                                                                         |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <b>3-The Complete Works of William Shakespeare. London: Canterbury Classics, 2023.</b><br><br><b>4- The Norton Anthology of World Literature. London: Norton, 2023.</b> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://englishworld.com/">https://englishworld.com/</a>                                                                                                       |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                  |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | <b>Notebook and data show equipped lecture room.</b>                                                                                                                    |
|                                                                          | <b>Supplies</b>                                    | <b>Teaching aids and computers.</b>                                                                                                                                     |
|                                                                          | <b>Other</b> (to be mentioned)                     | <b>Notebook and data show equipped lecture room.</b>                                                                                                                    |

|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b>                                                           |
|------------------|---------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr. Mai Abouzaid          | Prof. Ahmed Abd El-Gafar                                                             |
| <b>Signature</b> | <i>Mai Abouzaid</i>       |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |                 |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|-----------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Trade Law</b>                          |                  |                        |                 |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b><u>HUM 203</u></b>                     |                  |                        |                 |
| <b>Department/s that participated in the teaching:</b>                                                          | <b><u>BASIC SCIENCES</u></b>              |                  |                        |                 |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b>    |
|                                                                                                                 | <b><u>2</u></b>                           |                  |                        | <b><u>2</u></b> |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |                 |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |                 |
| <b>Academic Program:</b>                                                                                        | <b><u>ALL ENGINEERING PROGRAMS</u></b>    |                  |                        |                 |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |                 |
| <b>Name of Course Coordinator:</b>                                                                              |                                           |                  |                        |                 |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |                 |
| <b>Course Specification Approval Date:</b>                                                                      | <b><u>7/26/2025</u></b>                   |                  |                        |                 |

### 2. Course Overview (Brief summary of scientific content):

Kinds of contracts, contract constituents, contract administration, the limitations as imposed by law, disputes, claims, arbitration, the legal variables encountered in business and commercial transactions.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS).**

| <b>Program Outcomes (NARS/ARS)</b><br>(according to the matrix in the program specs) |                                                                                                                      | <b>Course Learning Outcomes</b>                                    |                                                                                                                                 |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>(A7, A8, A10)</b>                                                                 |                                                                                                                      | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                 |
| <b>Code</b>                                                                          | <b>Text</b>                                                                                                          | <b>Code</b>                                                        | <b>Text</b>                                                                                                                     |
| <b>A7</b>                                                                            | Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.                | <b>LO1</b>                                                         | <b>Assess issues of the latest knowledge about the concepts, characteristics, and types of contracts, contract constituents</b> |
|                                                                                      |                                                                                                                      | <b>LO2</b>                                                         | <b>Explain the main principle of Role of contracts: concept, attributes, and principles</b>                                     |
| <b>A8</b>                                                                            | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools. | <b>LO3</b>                                                         | <b>Elucidate the main principal Dynamic nature of contract administration,</b>                                                  |
|                                                                                      |                                                                                                                      | <b>LO4</b>                                                         | <b>Clarify the main principal-of limitations as imposed by law,</b>                                                             |
|                                                                                      |                                                                                                                      | <b>LO5</b>                                                         | <b>Design the , the legal variables encountered in business</b>                                                                 |
| <b>A10</b>                                                                           | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies..                         | <b>LO6</b>                                                         | <b>Solving problems related to commercial transactions.</b>                                                                     |
|                                                                                      |                                                                                                                      | <b>LO7</b>                                                         | <b>Evaluating search results, the limitations as imposed by law,</b>                                                            |
|                                                                                      |                                                                                                                      | <b>LO8</b>                                                         | <b>Describe the main concepts of the basics of the legal variables encountered in business and commercial transactions.</b>     |
|                                                                                      |                                                                                                                      | <b>LO9</b>                                                         | <b>Working in a team group</b>                                                                                                  |
|                                                                                      |                                                                                                                      | <b>LO10</b>                                                        | <b>Presentation techniques in performance and dealing with others and outside the organization</b>                              |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                          | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                              |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                              |                    |                                       | Tutorial | / Practical Lab |
| 1        | Fundamental of definition concepts, characteristics <b>Trade Law</b> - Dynamic nature and Kinds of contracts | 2                  | 2                                     | 0        | 0               |
| 2        | Continued...                                                                                                 | 2                  | 2                                     | 0        | 0               |
| 3        | Concepts and requirement of contract constituents,- concepts and requirement of contract administration      | 2                  | 2                                     | 0        | 0               |
| 4        | Continued                                                                                                    | 2                  | 2                                     | 0        | 0               |
| 5        | Cooperative and competitive negotiations- how to use the limitations as imposed by law                       | 2                  | 2                                     | 0        | 0               |
| 6        | Continued...                                                                                                 | 2                  | 2                                     | 0        | 0               |

|    |                                                                                                         |   |   |   |   |
|----|---------------------------------------------------------------------------------------------------------|---|---|---|---|
| 7  | <b>Revision and Mid Exam</b>                                                                            |   |   |   |   |
| 8  | Good preparation of disputes, claims- the legal variables - the legal variables encountered in business | 2 | 2 | 0 | 0 |
| 9  | Continued...                                                                                            | 2 | 2 | 0 | 0 |
| 10 | Commercial transactions- the legal variables encountered in commercial transactions                     | 2 | 2 | 0 | 0 |
| 11 | Continued...                                                                                            | 2 | 2 | 0 | 0 |
| 12 | The limitations as imposed by, disputes, claims, arbitration                                            | 2 | 2 | 0 | 0 |
| 13 | <b>Supplementary materials and Quiz</b>                                                                 | 2 | 2 | 0 | 0 |
| 14 | <b>Final Exam.</b>                                                                                      |   |   |   |   |

### 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | QUIZ 1 written (Semester work) | 4                               | 10            | 10%                              |
| 2   | QUIZ 2 written (Semester work) | 11                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15                              | 40            | 40 %                             |
| 5   | Assignments (Report & Sheet)   | 10,12                           | 20            | 20%                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                                  |                                                                                                                     |                                                                                                                   |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <b>Available Presentation (handed to students' part by part).</b>                                                 |
|                                                                  | <b>Other References</b>                                                                                             | محمد عبد الكريم يوسف- "الصياغة القانونية للعقود التجارية, 2021                                                    |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://www.edx.org/learn/business-administration">https://www.edx.org/learn/business-administration</a> |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                            |



|                                                                          |                                |                                                      |
|--------------------------------------------------------------------------|--------------------------------|------------------------------------------------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>     | <b>Notebook and data show equipped lecture room.</b> |
|                                                                          | <b>Supplies</b>                | <b>Teaching aids and computers.</b>                  |
|                                                                          | <b>Skill Labs/ Simulators</b>  |                                                      |
|                                                                          | <b>Other (to be mentioned)</b> | <b>Notebook and data show equipped lecture room.</b> |

|                  |                           |                                                                                     |
|------------------|---------------------------|-------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b>                                                          |
| <b>Name</b>      |                           | Prof. Ahmed Abd El-Gafar                                                            |
| <b>Signature</b> |                           |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                                        |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Transportation Planning and Traffic Engineering</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 211</b>                                         |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                      |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                                     | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                      | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                             |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                                        |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                      |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>                  |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr nada                                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department              |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                                     |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Principles of transportation planning And traffic engineering, Road user and vehicle characteristics. Travel time, speed and volume studies, highway capacity pedestrian parking and accident studies, traffic control devices, grade separations and / or interchange.

### **3. Course Learning Outcomes CLOs :**

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                | Course Learning Outcomes                                    |                                                                                            |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| A2, A3, A5, B2                                                            |                                                                                                                                                                                                                                                                                                                                                                | Upon completion of the course, the student will be able to: |                                                                                            |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                           | Code                                                        | Text                                                                                       |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                              | LO1                                                         | Use statistical analyses and objective engineering judgment to draw conclusions.           |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                            | LO 2                                                        | Apply engineering design processes to produce cost-effective solutions.                    |
| A5                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                                                                                                                                                                                                     | LO 3.                                                       | Practice research techniques and methods of investigation as an inherent part of learning. |
| B2                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | LO 4                                                        | Achieve an optimum planning of transportation networks.                                    |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                | LO5                                                         | Forecasting travel demand.                                                                 |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                | LO 6                                                        | Making balance between traffic demand and supply.                                          |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                | LO 7                                                        | Achieve traffic safety.                                                                    |

|  |  |      |                                              |
|--|--|------|----------------------------------------------|
|  |  | LO 8 | Analyses road capacity and level of service. |
|--|--|------|----------------------------------------------|

#### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        | √          |                       | √                  | √          |                | √          |               |                    |                                          |              |            |                 |

#### **Course Schedule:**

| Week No. | Scientific content of the course<br>(Course Topics)        | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                            |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                            |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction and Transportation planning elements          | 3                  | 2                                     | 1        | ...             |
| 2        | Transportation systems and organization                    | 3                  | 2                                     | 1        | ...             |
| 3        | Transportation models for travel demand forecasting stages | 3                  | 2                                     | 1        | ...             |
| 4        | Transportation models for trip generation                  | 3                  | 2                                     | 1        | ...             |
| 5        | Transportation models for trip distribution                | 3                  | 2                                     | 1        | ...             |
| 6        | Transportation models for trip assignment and model split  | 3                  | 2                                     | 1        | ...             |

|       |                                                                            |   |   |   |     |
|-------|----------------------------------------------------------------------------|---|---|---|-----|
| 7     | <b>Revision and Mid Exam</b>                                               |   |   |   |     |
| 8     | Traffic engineering scope and approaches Human and vehicle characteristics | 3 | 2 | 1 | ... |
| 9     | Traffic Engineering studies                                                | 3 | 2 | 1 | ... |
| 10    | Traffic Engineering studies                                                | 3 | 2 | 1 | ... |
| 11    | Traffic stream characteristics                                             | 3 | 2 | 1 | ... |
| 12    | Traffic operation and control<br>Accident analysis                         | 3 | 2 | 1 | ... |
| 13    | Traffic signals design                                                     | 3 | 2 | 1 | ... |
| 14    | Capacity analysis and level of service                                     | 3 | 2 | 1 | ... |
| 15,16 | <b>Final Exam.</b>                                                         |   |   |   |     |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 5                               | 10            | 10%                              |
| 2   | Exam 2 written (Semester work) | 10                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Final Oral Exam                | 14                              | 5             | 5%                               |
| 6   | Assignments / Project          | Weekly                          | 15            | 15%                              |

#### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                           |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | TRANSPORTATION ENGINEERING<br>BEVERLY T.KUHN 2019. 12309                                                                                                                                                                  |
|                                                                  | <b>Other References</b>                                                                                             | Traffic Engineering Handbook“,McShane, Willium R., Roess, Roger P., Prentice-Hall, Inc., Englewood Cliffs, New Gersey, USA,1990.<br>Highway Traffic Analysis and Design", Salter, R. J., The Macmillan Press, Ltd., 1992. |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | Highway Capacity Manual",<br>Transportation Research Board, ,<br>2000                                                                                                                                                     |

|                                                                          |                                                    |                        |
|--------------------------------------------------------------------------|----------------------------------------------------|------------------------|
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board |
|                                                                          | <b>Supplies</b>                                    | -----                  |
|                                                                          | <b>Electronic Programs</b>                         | -----                  |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | -----                  |
|                                                                          | <b>Virtual Labs</b>                                | -----                  |
|                                                                          | <b>Other</b> (to be mentioned)                     | -----                  |

|                  |                           |                            |
|------------------|---------------------------|----------------------------|
|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b> |
| <b>Name</b>      | Dr. Amr nada              | Dr. Ghada Nashaat Mohamed  |
| <b>Signature</b> | د/ عمرو عبدالغنى          | غادة نشأت                  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Specification, Bids and Contracts</b>  |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 212</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 1                                         | 1                |                        | 2            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Dr. Asmaa Ahmed Soliman</b>            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Introduction to the legal and contractual aspects of the construction industry. Techniques for coordinating decisions and actions in the design and construction of engineering projects. Bidding strategies and procedures. Different types of Specifications. Contract documents. Quantity surveying principals – Claims – Disputes – Contract types.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | Course Learning Outcomes                                    |                                                                                                  |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| A2, A3, A4, A5, A6, A8, B3, B4                                            |                                                                                                                                                                                                                                                                                                                     | Upon completion of the course, the student will be able to: |                                                                                                  |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                | Code                                                        | Text                                                                                             |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | LO1                                                         | Identify Bidding strategies and procedures                                                       |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO2                                                         | Identify the different types of Specifications                                                   |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | LO3                                                         | Apply the different solutions of expected and unexpected technical Quantity surveying principals |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | LO4                                                         | Describe the engineering projects                                                                |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO5                                                         | State the Claims, Disputes, and Contact types.                                                   |
| A5                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                                                                                                                                                          | LO6                                                         | Illustrate the Different types of Specifications.                                                |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                            | LO7                                                         | Plan construction of engineering projects documentation.                                         |
| A8                                                                        | Communicate effectively – graphically, verbally and in writing-with arrange of audiences using contemporary tools                                                                                                                                                                                                   | LO8                                                         | State the tender price of construction projects and estimate the contractor tender               |
| B3                                                                        | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and                                                                                                                                                   | LO9                                                         | Develop the Knowledge of construction contracts and process                                      |



|    |                                                                                               |      |                                                  |
|----|-----------------------------------------------------------------------------------------------|------|--------------------------------------------------|
|    | assess environmental impacts of projects.                                                     |      |                                                  |
| B4 | Deal with biddings, contracts and financial issues including project insurance and guarantees | LO10 | Develop the Knowledge of construction contracts. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | -                    | ✓                      | -          | -                     | -                  | -          | -              | -          | -             | -                  | -                                        | -            | -          | -               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                      | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                          |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                          |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to the legal and contractual aspects of the construction industry                           | 2                  | 1                                     | 1        | 0               |
| 2        | Introduction to the legal and contractual aspects of the construction industry                           | 2                  | 1                                     | 1        | 0               |
| 3        | Techniques for coordinating decisions and actions in the design and construction of engineering projects | 2                  | 1                                     | 1        | 0               |
| 4        | Techniques for coordinating decisions and actions in the design                                          | 2                  | 1                                     | 1        | 0               |

|       |                                                                                                               |   |   |   |   |
|-------|---------------------------------------------------------------------------------------------------------------|---|---|---|---|
|       | and construction of engineering projects.<br><a href="#">Types of Contracts in Civil Engineering Projects</a> |   |   |   |   |
| 5     | Techniques for coordinating decisions and actions in the design and construction of engineering projects.     | 2 | 1 | 1 | 0 |
| 6     | Bidding strategies and procedures.<br><a href="#">Workshop on Analyzing Real Engineering Contracts</a>        | 2 | 1 | 1 | 0 |
| 7     | <b>Revision and Mid Exam</b>                                                                                  |   |   |   |   |
| 8     | Different types of Specifications. Contract documents<br><a href="#">FIDIC Contracts and Their Types</a>      | 2 | 1 | 1 | 0 |
| 9     | Different types of Specifications. Contract documents                                                         | 2 | 1 | 1 | 0 |
| 10    | Quantity surveying principals.                                                                                | 2 | 1 | 1 | 0 |
| 11    | Quantity surveying principals.<br><a href="#">Comparative Study: FIDIC Contract vs. Local Contract</a>        | 2 | 1 | 1 | 0 |
| 12    | Claims- Disputes – Contract types.                                                                            | 2 | 1 | 1 | 0 |
| 13    | Claims- Disputes – Contract types.                                                                            | 2 | 1 | 1 | 0 |
| 14    | Revision                                                                                                      |   |   |   |   |
| 15,16 | <b>Final Exam.</b>                                                                                            |   |   |   |   |

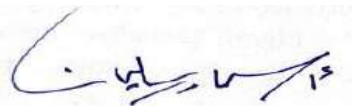
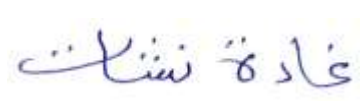
#### **5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            | 2                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work)            | 6                               | 10            | 10 %                             |
| 3   | Exam 3 written (Semester work)            | 12                              | 10            | 10 %                             |
| 4   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 5   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 6   | Assignments / Project /Portfolio/ Logbook | 10                              | 10            | 10 %                             |

## 6- Learning Resources and Supportive Facilities \*

|                                                           |                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning resources (books, scientific references, etc.) * | <p><b>The main (essential) reference</b><br/>(must be written in full according to the scientific documentation method)</p> | <ul style="list-style-type: none"> <li>• Civil Engineering: Building Materials Properties, Cayson Carter, Murphy &amp; Moore Library, 12375, New York, 2023.</li> <li>• Richard H. Clough, et al., "Construction Contracting A Practical Guide to Company Management". Publisher Wiley, ISBN: (978-1-118-69321-6), 2015</li> <li>• قانون رقم ١٨٢ لسنة ٢٠١٨ تنظيم التعاقدات وتعديلاته ولائحته التنفيذية. بإصدار قانون تنظيم التعاقدات التي تبرمها الجهات العامة</li> <li>• القانون المدني المصري قانون رقم ١٣١ لسنة ١٩٤٨ بإصدار القانون المدني وفقاً لآخر تعديل صادر في ١٣ أكتوبر عام ٢٠٢١.</li> <li>• قانون رقم ١٠٤ لسنة ١٩٩٢ بإنشاء الاتحاد المصري لمقاولي التشييد والبناء</li> </ul>                                                                  |
|                                                           | <p><b>Other References</b></p>                                                                                              | <ul style="list-style-type: none"> <li>• Lukas Klee; 2018, "International Construction Contract Law ". Publisher Wiley-Blackwell , ISBN: (9781119430384)</li> <li>• Donald Charrett; 2018 "The Application of Contracts in Engineering and Construction Projects". Publisher Informa Law from Routledge, ISBN: (9781351006347)</li> <li>• The Law of Construction Disputes; Cyril Chern; 2019 The Europa Directory of International Organizations 2021, Informa Law from Routledge, ISBN: (9781032176932)</li> <li>• The Europa Directory of International Organizations 2021; Europa Publications; 2021</li> <li>• أ.د. سامي محمد فريج- موسوعة إدارة العقود الهندسية وعقود التشييد- الثلاث الأجزاء -الناشر : دار الرضا للنشر والتوزيع - مصر</li> </ul> |
|                                                           | <p><b>Electronic Sources</b><br/>(Links must be added)</p>                                                                  | <ul style="list-style-type: none"> <li>• International Federation of Consulting Engineers <a href="https://fidic.org/">https://fidic.org/</a></li> <li>• Construction Management <b>Association</b> of America; <a href="https://www.cmaanet.org/">https://www.cmaanet.org/</a> (1982-now)</li> <li>•</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <ul style="list-style-type: none"> <li>Project Management <u>Institute</u>; <a href="https://www.pmi.org/">https://www.pmi.org/</a> (1969- now)</li> <li>American Society of Civil Engineers; <a href="https://www.Asce.org/">https://www.Asce.org/</a> (1852 to now)</li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                           |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Projector- White board- Personal Computer- Microsoft Team                                                                                                                                                                                                                        |
|                                                                          | <b>Supplies</b>                                    | Lecture notes                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Other</b> (to be mentioned)                     | --                                                                                                                                                                                                                                                                               |

|                  |                                                                                    |                                                                                     |
|------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                          | <b>Program Coordinator</b>                                                          |
| <b>Name</b>      | <b>Dr. Asmaa Ahmed Soliman</b>                                                     | <b>Dr. Ghada Nashaat Mohamed</b>                                                    |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Reinforced Concrete (2)</b>            |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 213</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 3                |                        | 5            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Design of floor systems, one way, two ways, ribbed, hollow and flat slabs. Design for torsion, combined shear and torsion by the strength method. Design of continuous beams. Moment redistribution for minimum rotation capacity. Design of columns under axial and eccentric loading, short and long columns, Staircases, and Footings.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                                          |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A4, A10<br/>B1, B2</b>                                                |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                          |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                                              |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | <b>LO1</b>                                                         | Identify the concrete properties of flexure, and torsion members to solve engineering-based design problems by applying design formulas. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO2</b>                                                         | Conduct design parameters of flexure, torsion, shear, and normal members.                                                                |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO3</b>                                                         | Employ the Egyptian code in the design of flexure, torsion, shear, and normal members.                                                   |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO4</b>                                                         | List the design methodologies for the design of columns.                                                                                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO5</b>                                                         | Describe the different types of stairs.                                                                                                  |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.contexts of sustainable design and development                                                                                          | <b>LO6</b>                                                         | Apply the design process of reinforced concrete flat and hollow block slabs system to produce a cost-effective design.                   |
| <b>A10</b>                                                                       | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.                                                                                                                                                                                                                         | <b>LO7</b>                                                         | Utilize code practices and standards to design appropriate solid slab systems.                                                           |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical                                                                                                                                                  | <b>LO8</b>                                                         | Calculate the axial loads acting on columns.                                                                                             |

|           |                                                                                                                                                                                                                                                                                                                                                                 |             |                                                                                             |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------|
|           | measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                        | <b>LO9</b>  | Utilize the Egyptian code in the design and construction of reinforced concrete structures. |
|           |                                                                                                                                                                                                                                                                                                                                                                 | <b>LO10</b> | Select the appropriate structural system.                                                   |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources, and Harbors; or any other emerging field relevant to the discipline. | <b>LO11</b> | Achieve optimum design of special slab-system and flexure, torsion members.                 |
|           |                                                                                                                                                                                                                                                                                                                                                                 | <b>L12</b>  | Analysis of concrete shear and torsion strength and the safe design of beam elements.       |

#### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

**Course Schedule:**

| <i>Week No.</i> | <i>Topic</i>                                                                                                                                                                                                                                                  | <i>Total Hours</i> | <i>Contact hrs</i> |             |             |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|-------------|-------------|
|                 |                                                                                                                                                                                                                                                               |                    | <b>Lec.</b>        | <b>Tut.</b> | <b>Lab.</b> |
| <i>Week -1</i>  | Special slabs – introduction – ribbed slabs – hollow block slabs. Determine the axial compression load for standard blocks 400x200x200.                                                                                                                       | 5                  | 2                  | 2           | 1           |
| <i>Week-2</i>   | Analysis and design of hollow block slabs. Preparation of detailed drawings.                                                                                                                                                                                  | 5                  | 2                  | 2           | 1           |
| <i>Week-3</i>   | Analysis and design of hidden beams. Term project 1 for Hollow block slab.                                                                                                                                                                                    | 5                  | 2                  | 2           | 1           |
| <i>Week-4</i>   | Introduction on Flat slab, minimum dimensions. Equivalent frame method empirical method for solving flat slabs.                                                                                                                                               | 5                  | 2                  | 2           | 1           |
| <i>Week5</i>    | Check for punching shear and reinforcement details for flat slab Term project 2 for a flat slab.                                                                                                                                                              | 5                  | 2                  | 2           | 1           |
| <i>Week-6</i>   | Stair design – slab type stairs – cantilever type stairs – reinforcement details of stairs and ensure that graduates possess practical, code literate design capabilities.                                                                                    | 5                  | 2                  | 2           | 1           |
| <i>Week-7</i>   | <b>Revision and Midterm Exam.</b>                                                                                                                                                                                                                             |                    |                    |             |             |
| <i>Week-8</i>   | Design of sections subjected to torsion moment accompanied with shear force – code requirement details. Crack pattern for reinforced concrete beams failed in shear, and torsion and link the manual with the program by project application on sap software. | 5                  | 2                  | 2           | 1           |
| <i>Week-9</i>   | Introduction Columns, design of tied short columns and design of spiral short columns. Test small scales of short and spiral under axial compression load                                                                                                     | 5                  | 2                  | 2           | 1           |
| <i>Week-10</i>  | Loads on columns using actual reactions of beams or using area served method, the effective height of columns, cylinder-ness ratio. Test prototype of columns to determine the buckling effect.                                                               | 5                  | 2                  | 2           | 1           |
| <i>Week-11</i>  | Check whether the building is braced or un-braced                                                                                                                                                                                                             | 5                  | 2                  | 2           | 1           |



|                   |                                                                                                                                                   |   |   |   |   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| <i>Week-12</i>    | Check on long columns (braced and un-braced)                                                                                                      | 5 | 2 | 2 | 1 |
| <i>Week-13</i>    | Design of sections subjected to axial compression and uniaxial bending.                                                                           | 5 | 2 | 2 | 1 |
| <i>Week-14</i>    | Design of sections subjected to biaxial bending. Term project 3 for columns <b>and emphasis on submitting a report on experimental lab tests.</b> | 5 | 2 | 2 | 1 |
| <i>Week 15,16</i> | <b>Final Exam.</b>                                                                                                                                |   |   |   |   |

### **Experiment Topics:**

| <b>Serial</b> | <b>Experiment</b>                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1             | <ul style="list-style-type: none"> <li>Axial compression load for standard hollow block 400x200x200.</li> </ul>                                                  |
| 2             | <ul style="list-style-type: none"> <li>Test small scales of short and spiral under axial compression load to determine the effect of spiral stirrups.</li> </ul> |
| 3             | <ul style="list-style-type: none"> <li>Axial compression load for small scale of columns to determine the buckling effect.</li> </ul>                            |
|               | <ul style="list-style-type: none"> <li>Test prototype of RC beams under shear and torsion.</li> </ul>                                                            |

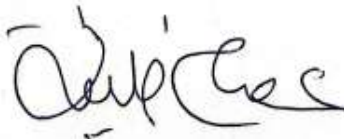
### **5- Methods of students' assessment:**

| <b>No.</b> | <b>Assessment Methods *</b> | <b>Assessment Timing (Week Number)</b> | <b>Marks/ Scores</b> | <b>Percentage of total course Marks</b> |
|------------|-----------------------------|----------------------------------------|----------------------|-----------------------------------------|
| 1          | Research Report             | <b>1,2</b>                             | <b>10</b>            | <b>10%</b>                              |
| 3          | Midterm exam                | <b>7</b>                               | <b>20</b>            | <b>20 %</b>                             |
| 4          | Project + (Lab sap 200)     | <b>5,8,10,12</b>                       | <b>30</b>            | <b>30%</b>                              |
| 5          | Final Written Exam          | <b>15, 16</b>                          | <b>40</b>            | <b>40 %</b>                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                         |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>DESIGN OF CONCRETE STRUCTURES DAVID DARWIN 2016</li> <li>Design of reinforced concrete structures: Dr. M. Goneem 2019</li> </ul> |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                          | <ul style="list-style-type: none"> <li>Design and construction of reinforced concrete structures ECP-203-2018</li> <li>Loads applied on building ECP-208</li> </ul>                                                                                                                                                                                                                                                                                                     |
|  | <b>Other References</b>                                                  | <ul style="list-style-type: none"> <li>ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>ASCE: American society of civil Engineering.</li> <li>BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                                                                  |
|  | <b>Electronic Sources</b><br>(Links must be added)                       | <ul style="list-style-type: none"> <li><a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html</a></li> <li><a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li><a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |
|  | <b>Learning Platforms</b><br>(Links must be added)                       | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  | <b>Supportive facilities &amp; equipment for teaching and learning *</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|  | <b>Devices/Instruments</b>                                               | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|  | <b>Supplies</b>                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|  | <b>Electronic Programs</b>                                               | AutoCAD program<br>CSI programs (SAP 2000)                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  | <b>Skill Labs/ Simulators</b>                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|  | <b>Virtual Labs</b>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Prof. Essam Khalifa</b>                                                          | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                              |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Structural Analysis and Mechanics (3)</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 214</b>                               |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                            |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                           | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                            | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                   |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                              |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                            |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>        |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan               |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department    |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                           |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Structural deformations and deflections due to axial force, bending moment, shear force and torsion. Energy and complementary energy concepts. Virtual work method; linear and nonlinear systems. Castiglione's theorem. Principle of minimum potential energy. Differential equations of beams and beam-columns in static and dynamic equilibrium. Finite difference and Rayleigh-Ritz method of solution; approximate methods of structural analysis; portal and cantilever

methods; sketching of deflected shapes. Influence lines of indeterminate structures; trusses and beams.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                     |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A9, B1</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                     |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                         |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Develop the suitable technique to calculate the deflection and analyze results to draw elastic curves.              |
| <b>A3</b>                                                                        | Apply engineering design process to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, and ethical and aspects as appropriate to discipline and within the principles and contexts of sustainable design and development.                                                                                                 | <b>LO2</b>                                                         | Apply to solve environmental problems and its effect on structures as loss of support                               |
| <b>A9</b>                                                                        | Use creative innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                                | <b>LO3</b>                                                         | Examine the creative solution for deflections and moving loads with flexible thinking and respond to new situations |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                                                         | Apply a full range of civil engineering concept and techniques by structure analysis.                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO5</b>                                                         | Apply a full range of civil engineering concept and techniques by structure analysis.                               |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      |            |                       | √                  | √          |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                       | Total Weekly Hours | Expected number of the Learning Hours |          |                |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|----------------|
|          |                                                                                                                                           |                    | Theoretical teaching (lectures)       | Training |                |
|          |                                                                                                                                           |                    |                                       | Tutorial | Practical /Lab |
| 1        | Beam's deflections using the double <b>integration</b> method.                                                                            | 4                  | 2                                     | 2        | -              |
| 2        | Beam's deflections using the double <b>integration</b> method, and quiz                                                                   | 4                  | 2                                     | 2        | -              |
| 3        | Beam's deflection using conjugate <b>beam</b> method.                                                                                     | 4                  | 2                                     | 2        | -              |
| 4        | Beam's deflections using the virtual work method and include a case study of an actual building with load analysis and structural design. | 4                  | 2                                     | 2        | -              |
| 5        | Frame's deflections using the virtual work method.                                                                                        | 4                  | 2                                     | 2        | -              |
| 6        | Truss's deflections using the virtual work method, quiz and organize a workshop in collaboration with a structural engineer               | 4                  | 2                                     | 2        | -              |

|       |                                                                                                                                                                                                                                                                                                                     |   |   |   |   |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|       | from a contracting company to present a real-life project                                                                                                                                                                                                                                                           |   |   |   |   |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                                                                                                                                        |   |   |   |   |
| 8     | Truss's deflections using the virtual work method. Effect of temperature and settlement and assign students a group project to analyze a real-life facility using engineering software.                                                                                                                             | 4 | 2 | 2 | - |
| 9     | on deflection. Influence lines for statically determine simple beams.                                                                                                                                                                                                                                               | 4 | 2 | 2 | - |
| 10    | Influence lines for statically determine continues beams and involve students in mini-projects that simulate the analysis of real structures using structural analysis software such as SAP2000 or ETABS. Assessment: Part of the final assessment will be devoted to practical application on a real-life project. | 4 | 2 | 2 | - |
| 11    | Influence lines for statically determine frames.                                                                                                                                                                                                                                                                    | 4 | 2 | 2 | - |
| 12    | Influence lines for statically determine frames.                                                                                                                                                                                                                                                                    | 4 | 2 | 2 | - |
| 13    | Influence lines for statically determine trusses.                                                                                                                                                                                                                                                                   | 4 | 2 | 2 | - |
| 14    | revision.                                                                                                                                                                                                                                                                                                           | 4 | 2 | 2 | - |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                                                                                                                                  |   |   |   |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 4                               | 10            | 10                               |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10                               |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments                    | 13                              | 20            | 20                               |

## **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Generative Structural Design Integrating BIM and Diffusion, Zhili He, Yu-Hsing Wang, Jian Zhang, <b>2023</b></li> <li>“Performance-Based Optimization of 2D Reinforced Concrete Moment Frames through Pushover Analysis and ABC Optimization Algorithm”, Saba Faghirnejad, <b>2023</b></li> <li>Theory of structures Vol. 1, W.M.El-Dakhakhni, Dar El-Maaref, Cairo &amp; Civil Engineering Department Library, H.T.I. of 10th of Ramadan, <b>2018</b></li> <li>Advanced Theory of Structure, V.N.VAZIRAMI, Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Analysis of Structures, V.N.VAZIRAMI, Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> <li>Structural Analysis, J.C.MCCO., Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> <li>Theory of Structures, R.S.KHURMI, Civil Engineering Department Library, H.T.I. of 10th of Ramadan.</li> <li>Lecture notes available (handed to students part by part).</li> </ul>                                                                                                                                                                             |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|  |                           |                            |
|--|---------------------------|----------------------------|
|  | <b>Course Coordinator</b> | <b>Program Coordinator</b> |
|--|---------------------------|----------------------------|

| Name      | Ass.Prof. Morcos Farid Samaan                                                     | Dr. Ghada Nashaat Mohamed                                                           |
|-----------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Signature |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Hydraulic Structures</b>               |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 301</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Provide an introduction to hydraulic structures. Design of inlet & outlet structures for irrigation canals. Hydraulic design of irrigation structures.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                         |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>A5, B1, B2</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                         |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                             |
| <b>A5</b>                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                                                                                                                                                                                                                                                  | <b>LO1</b>                                                         | Solve ideas in structural and mathematical terms. Solving problem and obtaining solutions in the field of Hydraulic structures design.. |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO2</b>                                                         | Design of inlet and outlet structures for irrigation canals. Hydraulic design of irrigation structures.                                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | Definition and designing of Hydrograph.                                                                                                 |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.                                              | <b>LO4</b>                                                         | Hydraulic design of irrigation structures.                                                                                              |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            | √                     | √                  | √          |                |            | √             |                    | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)          | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                              |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                              |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to Hydraulic Structures.                        | 3                  | 2                                     | 1        | ---             |
| 2        | Design of inlet and outlet structures for irrigation canals. | 3                  | 2                                     | 1        | ---             |
| 3        | Introduction to Cross structures.                            | 3                  | 2                                     | 1        | ---             |
| 4        | Hydraulic design for Culvert structure                       | 3                  | 2                                     | 1        | ---             |
| 5        | Hydraulic design for Culvert structure (Cont.)               | 3                  | 2                                     | 1        | ---             |
| 6        | Hydraulic design for Siphons structure.                      | 3                  | 2                                     | 1        | ---             |
| 7        | Revision and Mid Exam                                        |                    |                                       |          |                 |

|       |                                                  |   |   |   |     |
|-------|--------------------------------------------------|---|---|---|-----|
| 8     | Hydraulic design for Aqueducts structure.        | 3 | 2 | 1 | --- |
| 9     | Hydraulic design for Aqueducts structure (Cont.) | 3 | 2 | 1 | --- |
| 10    | Hydraulic design for Spillways structure.        | 3 | 2 | 1 | --- |
| 11    | Hydraulic design for Dams structure.             | 3 | 2 | 1 | --- |
| 12    | Hydraulic design for Dams structure (Cont.)      | 3 | 2 | 1 | --- |
| 13    | Energy dissipation below hydraulic structures.   | 3 | 2 | 1 | --- |
| 14    | Hydraulic design for Aqueducts structure.        | 3 | 2 | 1 | --- |
| 15,16 | <b>Final Exam.</b>                               |   |   |   |     |

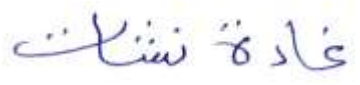
### **5- Methods of students' assessment:**

| No. | Assessment Methods *             | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)   | <b>11</b>                       | <b>10</b>     | <b>10 %</b>                      |
| 2   | Midterm exam                     | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 3   | Final Written Exam               | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 4   | Assignments / Project /Portfolio | <b>weekly</b>                   | <b>30</b>     | <b>30 %</b>                      |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <p><b>The main (essential) reference</b><br/>(must be written in full according to the scientific documentation method)</p> <ul style="list-style-type: none"> <li>• S.K. Sharma, Hydraulic Structures Design of Irrigation Structures, RSM Press, ISBN-13: 978-9352533770, January 2017.</li> <li>• Irrigation Engineering and Hydraulic, Dr. S.K.Sharma, S.Chand PUBLISHING, 12171, NEW DELHI, 2016</li> <li>• Civil Engineering Hydraulics: Essential Theory with Worked Examples, Martin Marriott, May 2, 2016.</li> </ul> |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          | <b>Other References</b>                            | <ul style="list-style-type: none"> <li>• C. Nalluri, Martin Marriott, Civil Engineering Hydraulics, Wiley – Blackwell, 5th. Ed., 2009.</li> <li>• Lecturer Notes in Hydraulics (Dr. Osama Khairy, Dr. Yasser Khairy)</li> <li>• A Text Book of Hydrology Open Channel Hydraulics DESIGN by Terry W.</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li>• <a href="https://www.hydraulics.org/">https://www.hydraulics.org/</a></li> </ul>                                                                                                                                                                                      |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                         |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Supplies</b>                                    | MS Team                                                                                                                                                                                                                                                                                                        |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                                                             |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Coastal and Harbour Engineering</b>    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 303</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Define water waves, wave refraction, diffraction, refraction. Measurements of waves. Coastal currents and tides. Motion of sediment along coast. Design of harbor elements.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                      |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, B1, B2, B3</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                      |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                          |
| <b>A2</b>                                                                        | Develop appropriate experimentation or simulation and interpret data, assess and evaluate findings, and use statistical analysis and objective engineering judgment to draw conclusions                                                                                                                                                                                                                     | <b>LO1</b>                                                         | Understanding the dimensions of complex Coastal and Harbor Engineering problems and challenges by applying basic scientific principles and engineering fundamentals. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Evaluate the coastal engineering design.                                                                                                                             |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                                                         | Select appropriate sustainable coastal engineering design and management approaches.                                                                                 |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.                                              | <b>LO4</b>                                                         | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; in coastal engineering structures                 |
| <b>B3</b>                                                                        | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.                                                                                                                                                                                                 | <b>LO5</b>                                                         | Obtained results both individually or as a part of team. Illustrate the main phenomena which affecting on the coastal engineering.                                   |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  | √          |                |            | √             |                    | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)  | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                      |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                      |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to Coastal and Harbor Engineering       | 3                  | 2                                     | 1        | ---             |
| 2        | Definition of water waves, its analysis.             | 3                  | 2                                     | 1        | ---             |
| 3        | Water waves refraction, diffraction, and reflection. | 3                  | 2                                     | 1        | ---             |
| 4        | Costal currents and tides                            | 3                  | 2                                     | 1        | ---             |
| 5        | Motion of sediment along the coast, and its effects. | 3                  | 2                                     | 1        | ---             |
| 6        | Surveying of coastal areas & collection of data.     | 3                  | 2                                     | 1        | ---             |
| 7        | Revision and Mid Exam                                |                    |                                       |          |                 |



|       |                                                                                     |   |   |   |     |
|-------|-------------------------------------------------------------------------------------|---|---|---|-----|
| 8     | Harbors type, selection of sites, and its constituents for various purposes (cont). | 3 | 2 | 1 | --- |
| 9     | Design and maintenance of breakwaters and jetties. Q                                | 3 | 2 | 1 | --- |
| 10    | Design of wharf, shipway.                                                           | 3 | 2 | 1 | --- |
| 11    | Design of dry docks.                                                                | 3 | 2 | 1 | --- |
| 12    | Shore protection 1                                                                  | 3 | 2 | 1 | --- |
| 13    | Shore protection 2                                                                  | 3 | 2 | 1 | --- |
| 14    | Harbors type, selection of sites, and its constituents for various purposes.        | 3 | 2 | 1 | --- |
| 15,16 | <b>Final Exam.</b>                                                                  |   |   |   |     |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *             | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)   | <b>11</b>                       | <b>10</b>     | <b>10 %</b>                      |
| 2   | Midterm exam                     | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 3   | Final Written Exam               | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 4   | Assignments / Project /Portfolio | <b>weekly</b>                   | <b>30</b>     | <b>30 %</b>                      |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <p><b>The main (essential) reference</b><br/>(must be written in full according to the scientific documentation method)</p> <ul style="list-style-type: none"> <li>• Agerschou, H., Lundgren, H., and Sorensen, T. (1983) "Planning and Design of Ports and Marine Terminals"</li> <li>• Dean, R. and Dalrymple, R. A. (1984) "Wave Mechanics for Engineers and Scientists"</li> <li>• Abou Seida, M. M. (2002) "Introduction to Coastal and Harbor Engineering" Faculty of Engineering, Cairo University.</li> </ul> |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                          |                                                                                                                                                                                                                                                                                                                            |
|--|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                          | <ul style="list-style-type: none"> <li>• El Mongy, A. (1994) “Natural Phenomena Affecting Harbor and Coastal Process” Faculty of Engineering, Ain Shams University</li> <li>• Heikal, E. M. (2003) “Lectures Notes on Harbor Engineering and Marine Structures” Faculty of Engineering, Zagazig University</li> </ul>      |
|  | <b>Other References</b>                                                  | <ul style="list-style-type: none"> <li>• A Text Book of harbour engineering of (Dr. Ibrahim Abido) Part (1) &amp; Part (2)</li> <li>• A. Pecher and J.P. Kofoed (2017.), Handbook of Ocean Wave Energy, Ocean Engineering &amp; Oceanography 7, DOI 10.1007/978-3-319-39889-1_4 , SBN 978-3-319-39889-1 (eBook)</li> </ul> |
|  | <b>Electronic Sources</b><br>(Links must be added)                       | --                                                                                                                                                                                                                                                                                                                         |
|  | <b>Learning Platforms</b><br>(Links must be added)                       | EKB - Microsoft office                                                                                                                                                                                                                                                                                                     |
|  | <b>Supportive facilities &amp; equipment for teaching and learning *</b> |                                                                                                                                                                                                                                                                                                                            |
|  | <b>Devices/Instruments</b>                                               | Data Show, White Board                                                                                                                                                                                                                                                                                                     |
|  | <b>Supplies</b>                                                          | MS Team                                                                                                                                                                                                                                                                                                                    |
|  | <b>Electronic Programs</b>                                               | --                                                                                                                                                                                                                                                                                                                         |
|  | <b>Skill Labs/ Simulators</b>                                            | --                                                                                                                                                                                                                                                                                                                         |
|  | <b>Virtual Labs</b>                                                      | --                                                                                                                                                                                                                                                                                                                         |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Surface and Ground-Water Hydrology</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 305</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Review of hydrologic cycle elements. Computation of average precipitation stream flow & stage discharge relationship. Hydrographic. Analysis, infiltration indices, hydrographic of basin out flow. Unit hydrographic. Storage routing, natural channels & reservoirs. Probability concepts in design recurrence interval. Flood frequency analysis & flow direction curves. Ground water, hydraulics of wells, boundary effects, well construction & maintenance.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | Course Learning Outcomes                                    |                                                                                                                    |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| A2, A10, B1                                                               |                                                                                                                                                                                                                                                                                                                                                                                                             | Upon completion of the course, the student will be able to: |                                                                                                                    |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                        | Code                                                        | Text                                                                                                               |
| A2                                                                        | Develop appropriate experimentation or simulation and interpret data, assess and evaluate findings, and use statistical analysis and objective engineering judgment to draw conclusions.                                                                                                                                                                                                                    | LO1                                                         | Interpret fundamentals Solve complex Hydrology problems..                                                          |
| A10                                                                       | Acquire and apply new knowledge and practice self, lifelong and other learning strategies                                                                                                                                                                                                                                                                                                                   | LO2                                                         | Study the hydrograph. Analyses the Sum curve, inflow and outflow, storage and flood routing.                       |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO3                                                         | Studying ground water flow and wells. Solve the problems of wells. Use the Excel sheet solve the ground water flow |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO4                                                         | Select appropriate sustainable Hydrology engineering design and management approaches.                             |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  | √          |                |            | √             |                    | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                     | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                         |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                         |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to hydrology science.                                                                                                      | 3                  | 2                                     | 1        | ---             |
| 2        | Studying the hydrology cycle.                                                                                                           | 3                  | 2                                     | 1        | ---             |
| 3        | Studying the water balance equation and the metrological data (Temperature – Solar radiation – Wind – Atmospheric pressure - Humidity). | 3                  | 2                                     | 1        | ---             |
| 4        | Studying precipitation – evaporation.                                                                                                   | 3                  | 2                                     | 1        | ---             |
| 5        | Studying transpiration                                                                                                                  | 3                  | 2                                     | 1        | ---             |
| 6        | Studying infiltration.                                                                                                                  | 3                  | 2                                     | 1        | ---             |
| 7        | Revision and Mid Exam                                                                                                                   |                    |                                       |          |                 |

|       |                                            |   |   |   |     |
|-------|--------------------------------------------|---|---|---|-----|
| 8     | Studying the hydrograph – Unit hydrograph. | 3 | 2 | 1 | --- |
| 9     | Studying the complex hydrograph.           | 3 | 2 | 1 | --- |
| 10    | Storage.                                   | 3 | 2 | 1 | --- |
| 11    | Flood routing.                             | 3 | 2 | 1 | --- |
| 12    | Ground water hydrology.                    | 3 | 2 | 1 | --- |
| 13    | Cont. Ground water hydrology               | 3 | 2 | 1 | --- |
| 14    | Studying the hydrograph – Unit hydrograph. | 3 | 2 | 1 | --- |
| 15,16 | <b>Final Exam.</b>                         |   |   |   |     |

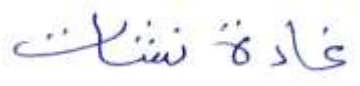
### **5- Methods of students' assessment:**

| No. | Assessment Methods *             | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)   | <b>11</b>                       | <b>10</b>     | <b>10 %</b>                      |
| 2   | Midterm exam                     | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 3   | Final Written Exam               | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 4   | Assignments / Project /Portfolio | <b>weekly</b>                   | <b>30</b>     | <b>30 %</b>                      |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <p><b>The main (essential) reference</b><br/>(must be written in full according to the scientific documentation method)</p> <ul style="list-style-type: none"> <li>• S.K. Sharma, Hydraulic Structures Design of Irrigation Structures, RSM Press, ISBN-13: 978-9352533770, January 2017.</li> <li>• Irrigation Engineering and Hydraulic, Dr. S.K.Sharma, S.Chand PUBLISHING, 12171, NEW DELHI, 2016</li> <li>• Civil Engineering Hydraulics: Essential Theory with Worked Examples, Martin Marriott, May 2, 2016.</li> </ul> |
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|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          | <b>Other References</b>                            | <ul style="list-style-type: none"> <li>• C. Nalluri, Martin Marriott, Civil Engineering Hydraulics, Wiley – Blackwell, 5th. Ed., 2009.</li> <li>• Drainage Engineering (Part (1) &amp; Part (2), 1983, Dr. Nazeh Asaad Younan – Faculty of Engineering, Alexandria University</li> <li>• A Text Book of Hydrology Open Channel Hydraulics DESIGN by Terry W.</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li>• <a href="https://www.hydraulics.org/">https://www.hydraulics.org/</a></li> </ul>                                                                                                                                                                                                                                               |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Devices/Instruments</b>                         | Data Show, White Board                                                                                                                                                                                                                                                                                                                                                  |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Supplies</b>                                    | MS Team                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                                                                                                                      |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                            |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Irrigation and Drainage Engineering</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 307</b>                             |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                          |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                         | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                          | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                   |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                            |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                          |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>      |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                    |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department  |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                         |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Soil water relations. Planning irrigation & drainage schemes. Water requirement. Methods of irrigation. Design of canals & drains, subsurface drainage, introduction to the design of irrigation Structures.



### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                     |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A3, A6, B1, B2</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                     |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                         |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                        | <b>LO1</b>                                                         | Solve problem of irrigation structures. Develop logical thinking.                                                                                   |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Use mathematical, and theories formulae to Identify Methods of subsurface drainage. Design by different techniques irrigation and drainage project. |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | <b>LO3</b>                                                         | Apply the different solutions of expected and unexpected technical problems related Irrigation and Drainage Structures.                             |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                                                         | Select appropriate sustainable Hydrology engineering design and management approaches.                                                              |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and                                                                                                               | <b>LO5</b>                                                         | Achieve an optimum design Hydrology engineering structures.                                                                                         |

|  |                                                                   |  |  |
|--|-------------------------------------------------------------------|--|--|
|  | Harbours; or any other emerging field relevant to the discipline. |  |  |
|--|-------------------------------------------------------------------|--|--|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        |            | √                     | √                  | √          |                |            | √             |                    | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)    | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                     |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                     |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to Irrigation and Drainage Engineering | 3                  | 2                                     | 1        | ---             |
| 2        | Define the relation between soil and water          | 3                  | 2                                     | 1        | ---             |
| 3        | Planning Irrigation and Drainage Schemes.           | 3                  | 2                                     | 1        | ---             |
| 4        | Planning Irrigation and Drainage Schemes (cont.).   | 3                  | 2                                     | 1        | ---             |
| 5        | Planning Irrigation and Drainage Schemes (cont.).   | 3                  | 2                                     | 1        | ---             |
| 6        | Water requirements                                  | 3                  | 2                                     | 1        | ---             |

|       |                                          |   |   |   |     |
|-------|------------------------------------------|---|---|---|-----|
| 7     | <b>Revision and Mid Exam</b>             |   |   |   |     |
| 8     | Methods of irrigation.                   | 3 | 2 | 1 | --- |
| 9     | Methods of irrigation (cont.).           | 3 | 2 | 1 | --- |
| 10    | Design of canals and Drains              | 3 | 2 | 1 | --- |
| 11    | Methods of subsurface drainage.          | 3 | 2 | 1 | --- |
| 12    | Design of irrigation structures          | 3 | 2 | 1 | --- |
| 13    | Design of irrigation structures          | 3 | 2 | 1 | --- |
| 14    | Design of irrigation structures (cont.). | 3 | 2 | 1 | --- |
| 15,16 | <b>Final Exam.</b>                       |   |   |   |     |

**5- Methods of students' assessment:**

| No. | Assessment Methods *             | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)   | 11                              | 10            | 10 %                             |
| 2   | Midterm exam                     | 7                               | 20            | 20 %                             |
| 3   | Final Written Exam               | 15, 16                          | 40            | 40 %                             |
| 4   | Assignments / Project /Portfolio | weekly                          | 30            | 30 %                             |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <p><b>The main (essential) reference</b><br/>(must be written in full according to the scientific documentation method)</p> <ul style="list-style-type: none"> <li>• Water irrigation management and land developm, abhishek anand, venus book, 12374, India, 2023</li> <li>• Irrigation Engineering and Hydraulic, Dr. S.K.Sharma, S.Chand PUBLISHING, 12171, NEW DELHI, 2016</li> <li>• S.K. Sharma, Hydraulic Structures Design of Irrigation Structures, RSM Press,</li> </ul> |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | ISBN-13: 978-9352533770, January 2017.<br>• Civil Engineering Hydraulics: Essential Theory with Worked Examples, Martin Marriott, May 2, 2016.                                                                                                                                                                                                                                                                   |
|                                                                          | <b>Other References</b>                            | <ul style="list-style-type: none"> <li>• C Nazeih Assaad Younan, Design Textbooks in Civil Engineering – Irrigation Structures.</li> <li>• Drainage Engineering (Part (1) &amp; Part (2), 1983, Dr. Nazeih Asaad Younan – Faculty of Engineering, Alexandria University</li> <li>• Design of Irrigation structures, by Prof. Dr. Ayman Elsellawy and Ass. Prof. Dr. Amir Mobasher, AlAzhar University</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | • WWW. Irrigation Structures.                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Supplies</b>                                    | MS Team                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                                                                                                                                                               |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Selected Topics in Water Resources</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 309</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Review of hydrologic cycle elements and the factors which affecting water resources, Studying Water resources in Egypt, and Arab countries, Studying River Nile in Egypt and its characteristics, Design of Irrigation Structures, Water quality guidelines, Ground water hydrology, hydraulics of wells, Pollution of Ground water, and its effects on environment surrounding.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | Course Learning Outcomes                                    |                                              |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------|
| A3, A4, A6, B1, B2                                                        |                                                                                                                                                                                                                                                                                                                                                                                                             | Upon completion of the course, the student will be able to: |                                              |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                        | Code                                                        | Text                                         |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                        | LO1                                                         | Define the principles of hydrological cycle. |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO2                                                         | Define of Water resources in Egypt.          |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles                                                                                                                                                                                                                                 | LO3                                                         | Define of Nile river structures..            |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO4                                                         | Define Water quality guide lines             |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | LO5                                                         | Define dam's types.                          |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO6                                                         | Definition and designing of Hydrograph.      |

|           |                                                                                                                                                                                                                                                                                                                                                                 |            |                                |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------|
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline. | <b>LO7</b> | Design of arch dams structure. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  | √          |                |            | √             |                    | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics) | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                     |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to water resources.                    | 3                  | 2                                     | 1        | ---             |

|       |                                                                                       |   |   |   |     |
|-------|---------------------------------------------------------------------------------------|---|---|---|-----|
| 2     | Review of hydrologic cycle elements, and the factors which affecting water resources. | 3 | 2 | 1 | --- |
| 3     | Water resources in Egypt, and Arab countries.                                         | 3 | 2 | 1 | --- |
| 4     | River Nile in Egypt and its characteristics.                                          | 3 | 2 | 1 | --- |
| 5     | Irrigation structures in River Nile in Egypt, and its benefits.                       | 3 | 2 | 1 | --- |
| 6     | Introduction to irrigation works, and its uses.                                       | 3 | 2 | 1 | --- |
| 7     | <b>Revision and Mid Exam</b>                                                          |   |   |   |     |
| 8     | Water quality guidelines.                                                             | 3 | 2 | 1 | --- |
| 9     | Ground water hydrology                                                                | 3 | 2 | 1 | --- |
| 10    | Pollution of Ground water, and its effects on environment surrounding.                | 3 | 2 | 1 | --- |
| 11    | Define of wells, and its maintenance.                                                 | 3 | 2 | 1 | --- |
| 12    | Introduction to dams                                                                  | 3 | 2 | 1 | --- |
| 13    | Design of arch dams                                                                   | 3 | 2 | 1 | --- |
| 14    | Hydrograph calculations.                                                              | 3 | 2 | 1 | --- |
| 15,16 | <b>Final Exam.</b>                                                                    |   |   |   |     |

**5- Methods of students' assessment:**

| No. | Assessment Methods *             | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)   | <b>11</b>                       | <b>10</b>     | <b>10 %</b>                      |
| 2   | Midterm exam                     | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 3   | Final Written Exam               | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 4   | Assignments / Project /Portfolio | <b>weekly</b>                   | <b>30</b>     | <b>30 %</b>                      |



## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• Water irrigation management and land developm, abhishek anand, venus book, 12374, India, 2023</li> <li>• Irrigation Engineering and Hydraulic, Dr. S.K.Sharma, S.Chand PUBLISHING, 12171, NEW DELHI, 2016</li> <li>• Civil Engineering Hydraulics: Essential Theory with Worked Examples, Martin Marriott, May 2, 2016.</li> </ul>           |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• A Text Book of Hydrology and Water Resources , Sharma.</li> <li>• Water Resources Systems , Chin.</li> <li>• C Nazeih Assaad Younan, Design Textbooks in Civil Engineering – Irrigation Structures.</li> <li>• Design of Irrigation structures, by Prof. Dr. Ayman Elsellawy and Ass. Prof. Dr. Amir Mobasher, AlAzhar University</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>• WWW. Irrigation Structures.</li> </ul>                                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Supplies</b>                                                                                                     | MS Team                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                    |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Water Pollution Control Processes</b>  |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 311</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Fadia Salem                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Fundamental theories of water pollution control. Processes and their application to water and wastewater treatment; gas transfer, sedimentation, coagulation and flocculation, filtration, aerobic and biological oxidation processes.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><br><b>A3, A4, B1, B3</b> |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b> |                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Code</b>                                                                                                   | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                     | <b>Text</b>                                                                                                                 |
| <b>A3</b>                                                                                                     | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                      | Identify the sludge processing and disposal. Solve the different processes of water pollution control.                      |
| <b>A4</b>                                                                                                     | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO2</b>                      | Make internet searches.                                                                                                     |
| <b>B1</b>                                                                                                     | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                      | Definition and designing of wells, and its maintenance.                                                                     |
| <b>B3</b>                                                                                                     | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.                                                                                                                                                                                                 | <b>LO4</b>                      | Plan the different processes of water pollution control: flotation, filtration, aerobic and biological oxidation processes. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      | √          |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                                                                 | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                  |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                  |                    |                                       | Tutorial | Practical / Lab |
| 1        | Particle removal by flotation processes. Particle removal by filtration processes.                               | 3                  | 2                                     | 1        | --              |
| 2        | Membrane processes (Microb-filtration – ultra- filtration – nanofiltration – reverse osmosis – electrodialysis)  | 3                  | 2                                     | 1        | --              |
| 3        | Adsorption (Activated carbon – Adsorb. processes (powdered activated carbon PAC – granular activated carbon GAC) | 3                  | 2                                     | 1        | --              |
| 4        | Chemical precipitation (processes: Ca and Mg – Phosphorus)                                                       | 3                  | 2                                     | 1        | --              |
| 5        | Ion Exchange (selectivity and capacity of exchange resins)                                                       | 3                  | 2                                     | 1        | --              |
| 6        | Ion exchange application                                                                                         | 3                  | 2                                     | 1        | --              |

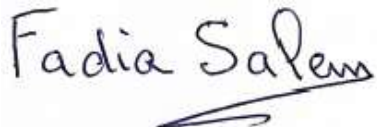
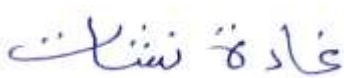
|       |                                                                                                                                                                      |   |   |   |    |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                         |   |   |   |    |
| 8     | Biological processes (factors affecting microbial growth: energy and cell synthesis – nutrient requirements – Influence of temp)                                     | 3 | 2 | 1 | -- |
| 9     | Biological Reactors.                                                                                                                                                 | 3 | 2 | 1 | -- |
| 10    | Activated Sludge Process (N2 removal – Biology. phosphorus removal)                                                                                                  | 3 | 2 | 1 | -- |
| 11    | Aerobic bio filters (Rotating Biological Contactor)                                                                                                                  | 3 | 2 | 1 | -- |
| 12    | Anaerobic processes (process technology – process design)                                                                                                            | 3 | 2 | 1 | -- |
| 13    | Sludge processing and disposal (Alum sludge – sewage slug Industrial W.W. sludge – sludge stabilization (anaerobic digestion - aerobic digestion) – sludge disposal) | 3 | 2 | 1 | -- |
| 14    | Disinfection (Chemical Agents, Heat, Ultra-Violet light, Ozone, Chlorine)                                                                                            | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                   |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                       | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)             | <b>11</b>                       | <b>15</b>     | <b>15 %</b>                      |
| 2   | Midterm exam                               | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 3   | Final Written Exam                         | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 4   | Tutorial and report assessment (Term Work) | <b>weekly</b>                   | <b>25</b>     | <b>25 %</b>                      |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Wastewater Treatment: Concepts And Practices, Ronald Hogan, Syrawood, 12301, NEW YORK, <b>2019</b>.</li> <li>Waste Water Recycling and Management, Sadhan Kumar Ghosh, Springer, 12302, SINGAPORE, <b>2019</b>.</li> </ul>                                                                                                                 |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Water Supply and Pollution Control 7th edition; Warren Viessman, Jr. &amp; Mark J. Hamer</li> <li>Egyptian Code of Practice for wastewater treatment design, 1998 Ministerial decree 52/1998</li> <li>Warren Viessman, Water Supply and Pollution Control, 2009, Pearson Prentice Hall, Upper Saddle River, ISBN:9780132337175.</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                            |
|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                                                                                                                            |
|                                                                          | <b>Supplies</b>                                                                                                     | MS Team                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Fadia Salem</b>                                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Environmental Engineering</b>          |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 313</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Fadia Salem                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

The course provides information on the major environmental challenges facing the world, and Egypt specifically, with a focus on environmental pollution considering the different sources, effects, and treatments. The course discusses water pollution, air pollution, noise pollution, solid and hazardous waste management, and the different pollution prevention and abatement technologies.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><br><b>A3, A4, A6, B1, B2, B3</b> |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b> |                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Code</b>                                                                                                           | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                     | <b>Text</b>                                                                                                                                                                                                                                            |
| <b>A3</b>                                                                                                             | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                      | Apply sustainable cost-effective solutions based on scientific engineering principles to improve the natural environment for the development and benefit of the society.                                                                               |
| <b>A4</b>                                                                                                             | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO2</b>                      | Utilize the Egyptian environmental legislations and relevant codes of practices, in addition to the international environmental agendas and recognized best practices, to base solutions for natural environment enhancements and pollution abatement. |
| <b>A6</b>                                                                                                             | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | <b>LO3</b>                      | Evaluate the environmental pollution / deterioration magnitude considering the different types of pollution.                                                                                                                                           |
| <b>B1</b>                                                                                                             | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                      | Select appropriate sustainable cost-effective treatments and management approaches through numerical approaches.                                                                                                                                       |
| <b>B2</b>                                                                                                             | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth                                                                                                                                                                                                                                                                                                                | <b>LO5</b>                      | Design of Sanitary treatments Works                                                                                                                                                                                                                    |



|           |                                                                                                                                                                                                             |            |                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------|
|           | Retaining Structures; and at least three of the following civil engineering topics: Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline.       |            |                                                                 |
| <b>B3</b> | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects. | <b>LO6</b> | Assess environmental impacts of different industrial processes. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      | √          |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics) | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                  |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                  |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to pollution problems.              | 3                  | 2                                     | 1        | --              |

|       |                                                                                                                                           |   |   |   |    |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| 2     | Environmental laws (pollution control laws)                                                                                               | 3 | 2 | 1 | -- |
| 3     | Water pollution (source of water pollution- measurement of water quality- wasted treatment)                                               | 3 | 2 | 1 | -- |
| 4     | Water pollution (The methods disposal of treated waste water and sludge)                                                                  | 3 | 2 | 1 | -- |
| 5     | Water pollution (The methods disposal of solid and hazardous waste law)                                                                   | 3 | 2 | 1 | -- |
| 6     | Air pollution (source of air pollution- effects of air pollution (health effects- effects on domestic animals, materials and atmosphere ) | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                                                                              |   |   |   |    |
| 8     | Measurement of air quality- air pollution control air pollution law)                                                                      | 3 | 2 | 1 | -- |
| 9     | Air pollution (measurement of air quality – air pollution control - air pollution law)                                                    | 3 | 2 | 1 | -- |
| 10    | Noise pollution (source of noise pollution- noise measurement and control)                                                                | 3 | 2 | 1 | -- |
| 11    | Solid waste (source and solid waste)                                                                                                      | 3 | 2 | 1 | -- |
| 12    | Solid waste (the methods disposal of solid waste (onsite incinerator – pyrolysis of solid waste)                                          | 3 | 2 | 1 | -- |
| 13    | Solid waste (the methods disposal of solid waste( sanitary land fills                                                                     | 3 | 2 | 1 | -- |
| 14    | composition of (MSW)                                                                                                                      | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                                        |   |   |   |    |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods * | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------|---------------------------------|---------------|----------------------------------|
|-----|----------------------|---------------------------------|---------------|----------------------------------|

|   |                                            |               |           |             |
|---|--------------------------------------------|---------------|-----------|-------------|
| 1 | Exam 1 written (Semester work)             | <b>11</b>     | <b>15</b> | <b>15 %</b> |
| 2 | Midterm exam                               | <b>7</b>      | <b>20</b> | <b>20 %</b> |
| 3 | Final Written Exam                         | <b>15, 16</b> | <b>40</b> | <b>40 %</b> |
| 4 | Tutorial and report assessment (Term Work) | <b>weekly</b> | <b>25</b> | <b>25 %</b> |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• William P. Cun, Principles of Environmental, New York, <b>2020</b>, McGraw Hill</li> <li>• Waste Water Recycling and Management, Sadhan Kumar Ghosh, Springer, 12302, SINGAPORE, <b>2019</b>.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Environmental Technology Handbook, James G. Speight, 2020, Gulf Professional Publishing, an imprint of Elsevier, Cambridge, MA, OCLC Number / Unique Identifier: 1129385226.</li> <li>• Waste Water Recycling and Management, Sadhan Kumar Ghosh, Springer, 12302, SINGAPORE, <b>2019</b>.</li> <li>• Water and Wastewater Engineering: Design Principles and Practice; Mackenzie L. Davis, 2010, McGraw-Hill, New York, ISBN:9780071713849"</li> <li>• Water Supply and Pollution Control 7th edition; Warren Viessman, Jr. &amp; Mark J. Hamer</li> <li>• Egyptian Code of Practice for wastewater treatment design, 1998 Ministerial decree 52/1998</li> <li>• Warren Viessman, Water Supply and Pollution Control, 2009, Pearson Prentice Hall, Upper Saddle River, ISBN:9780132337175.</li> </ul> |

|                                                                          |                                                    |                        |
|--------------------------------------------------------------------------|----------------------------------------------------|------------------------|
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | --                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board |
|                                                                          | <b>Supplies</b>                                    | MS Team                |
|                                                                          | <b>Electronic Programs</b>                         | --                     |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                     |
|                                                                          | <b>Virtual Labs</b>                                | --                     |
|                                                                          | <b>Other (to be mentioned)</b>                     | --                     |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Dr. Fadia Salem</b>                                                            | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Wastewater Reclamation and Reuse</b>   |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 315</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Fadia Salem                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

The curriculum addresses study Wastewater reuse as an essential part of water resources management, Characteristics of municipal secondary effluents and quality standards for reuse. Reclaimed Wastewater use in (agricultural, landscaping, recreational and industrial developments), Industrial wastes: (types, characteristics, reclamation and recycling), and also study the treatment Methods and disposal of industrial, wastes most common in the area.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><br><b>A3, A4, A6, B1, B2, B3</b> |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b> |                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Code</b>                                                                                                           | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                     | <b>Text</b>                                                                                                                    |
| <b>A3</b>                                                                                                             | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                      | Prepare and understand the uses of reclaimed wastewater in agricultural, landscaping, recreational and industrial development. |
| <b>A4</b>                                                                                                             | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO2</b>                      | Identify the characteristics of municipal secondary effluents.                                                                 |
| <b>A6</b>                                                                                                             | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | <b>LO3</b>                      | Review examples to overcome challenges of implementing recycling technologies.                                                 |
| <b>B1</b>                                                                                                             | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                      | Select appropriate and sustainable technologies for construction of hydraulic structures.                                      |
| <b>B2</b>                                                                                                             | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth                                                                                                                                                                                                                                                                                                                | <b>LO5</b>                      | Design the combined treatment units needed to achieve the required water quality standards.                                    |

|           |                                                                                                                                                                                                             |            |                         |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------|
|           | Retaining Structures; and at least three of the following civil engineering topics: Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline.       |            |                         |
| <b>B3</b> | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects. | <b>LO6</b> | Make internet searches. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      | √          |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                        | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                         |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                         |                    |                                       | Tutorial | Practical / Lab |
| 1        | Characteristics of municipal secondary effluents and Quality Standards. | 3                  | 2                                     | 1        | --              |

|       |                                                                                                                                   |   |   |   |    |
|-------|-----------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| 2     | Uses of reclaimed wastewater in agricultural, landscaping, recreational and Industrial development.                               | 3 | 2 | 1 | -- |
| 3     | Needs of the end user for specifications of recycling materials as a factor of recycling technologies methods.                    | 3 | 2 | 1 | -- |
| 4     | Study of waste types and the recycling technology needed                                                                          | 3 | 2 | 1 | -- |
| 5     | Recycling technologies,                                                                                                           | 3 | 2 | 1 | -- |
| 6     | Characteristics for organic liquid and organic solids processing.                                                                 | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                                                                      |   |   |   |    |
| 8     | Recycling technology characteristics for water processing and metal containing soil, sludge, sediment, or other solid processing. | 3 | 2 | 1 | -- |
| 9     | Recycling technology characteristics for metal containing soil, sludge, sediment, or other solid processing.                      | 3 | 2 | 1 | -- |
| 10    | Design of combined treatment units Physical Treatment.                                                                            | 3 | 2 | 1 | -- |
| 11    | Design of combined treatment units Aerobic Treatment.                                                                             | 3 | 2 | 1 | -- |
| 12    | Design of combined treatment units design of combined treatment units (chemical and anaerobic)                                    | 3 | 2 | 1 | -- |
| 13    | Case studies of successful examples to overcome the challenges of implementing recycling technologies.                            | 3 | 2 | 1 | -- |
| 14    | Demonstration of application of treatment trains to produce useful products from complex waste mixtures.                          | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                                |   |   |   |    |



**5- Methods of students' assessment:**

| No. | Assessment Methods *                       | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)             | 11                              | 15            | 15 %                             |
| 2   | Midterm exam                               | 7                               | 20            | 20 %                             |
| 3   | Final Written Exam                         | 15, 16                          | 40            | 40 %                             |
| 4   | Tutorial and report assessment (Term Work) | weekly                          | 25            | 25 %                             |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"><li>• Wastewater Treatment: Concepts And Practices, Ronald Hogan, Syrawood, 12301, NEW YORK, <b>2019</b>.</li><li>• Waste Water Recycling and Management, Sadhan Kumar Ghosh, Springer, 12302, SINGAPORE, <b>2019</b>.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"><li>• Water and Wastewater Engineering: Design Principles and Practice; Mackenzie L. Davis, 2010, McGraw-Hill, New York, ISBN:9780071713849"</li><li>• Water Supply and Pollution Control 7th edition; Warren Viessman, Jr. &amp; Mark J. Hamer</li><li>• Egyptian Code of Practice for wastewater treatment design, 1998 Ministerial decree 52/1998</li><li>• Edmund Besselievre and Others, The Treatment of Industrial Wastes, McGraw-Hill, New York, ISBN:9780070050471.</li><li>• Warren Viessman, Water Supply and Pollution Control, 2009, Pearson Prentice Hall, Upper Saddle River, ISBN:9780132337175.</li></ul> |

|                                                                          |                                                    |                        |
|--------------------------------------------------------------------------|----------------------------------------------------|------------------------|
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | --                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board |
|                                                                          | <b>Supplies</b>                                    | MS Team                |
|                                                                          | <b>Electronic Programs</b>                         | --                     |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                     |
|                                                                          | <b>Virtual Labs</b>                                | --                     |
|                                                                          | <b>Other (to be mentioned)</b>                     | --                     |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Dr. Fadia Salem</b>                                                            | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Industrial Wastes</b>                  |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 317</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Fadia Salem                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Quality & quantity of Water supplies to, & Wastes from industries. Methods of treatment & disposal of industrial, wastes most common in the area.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><br><b>A2, A3, A4, B1, B2</b> |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b> |                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Code</b>                                                                                                       | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                     | <b>Text</b>                                                                                                                                       |
| <b>A2</b>                                                                                                         | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                      | Assess industrial wastes considering the different types of pollution.                                                                            |
| <b>A3</b>                                                                                                         | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO2</b>                      | Apply the different solutions of expected and unexpected biological Waste water Treat. Processes problems.                                        |
| <b>A4</b>                                                                                                         | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO3</b>                      | Illustrate Wastewater minimization through industrial process changes, and ion Exchange: theory, plating waste treatment. Make internet searches. |
| <b>B1</b>                                                                                                         | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                      | Definition and designing of Hydrograph.                                                                                                           |
| <b>B2</b>                                                                                                         | Achieve an optimum design of                                                                                                                                                                                                                                                                                                                                                                                | <b>LO5</b>                      | Achieve industrial wastes impacts of different industrial processes.                                                                              |

|  |                                                                                                                  |  |  |
|--|------------------------------------------------------------------------------------------------------------------|--|--|
|  | Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. |  |  |
|--|------------------------------------------------------------------------------------------------------------------|--|--|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      | √          |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                                                            | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                             |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                             |                    |                                       | Tutorial | Practical / Lab |
| 1        | Source & Characteristics of Industrial Wastes. (Industrial waste survey, estimating organic content, ....)  | 3                  | 2                                     | 1        | --              |
| 2        | Pollution control,-Air Pollution & Disposal of gaseous wastes.,-Water Pollution &Disposal of liquid wastes. | 3                  | 2                                     | 1        | --              |
| 3        | Pollution control,-Solid waste Pollution &Disposal                                                          | 3                  | 2                                     | 1        | --              |
| 4        | Wastewater treats. processes: pre – and primary treat., biological treat., adsorption.                      | 3                  | 2                                     | 1        | --              |

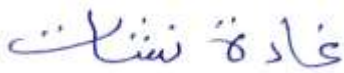
|       |                                                                                                                                                                                                     |   |   |   |    |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| 5     | Coagulation & precipitation: coagulation, Heavy metals removal.                                                                                                                                     | 3 | 2 | 1 | -- |
| 6     | Biological waste – water treat. Processes: Lagoons & stabilization basins, Aerated Lagoons, activated sludge processes, trickling filters, Rotating biological contactors, anaerobic decomposition. | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                        |   |   |   |    |
| 8     | Adsorption: Theory, Properties of activated carbon, powdered activated carbon treat processes (P A C T).                                                                                            | 3 | 2 | 1 | -- |
| 9     | Wastewater Minimization through industrial process changes                                                                                                                                          | 3 | 2 | 1 | -- |
| 10    | Ion Exchange: theory, plating waste treatment.                                                                                                                                                      | 3 | 2 | 1 | -- |
| 11    | Chemical Oxidation: Ozone, Hydrogen peroxide m Chlorine, Wearer oxidation.                                                                                                                          | 3 | 2 | 1 | -- |
| 12    | Sludge handling & Disposal: characteristics of sludge for disposal.                                                                                                                                 | 3 | 2 | 1 | -- |
| 13    | Gravity thickening, Aerobic & Anaerobic digestion, sand drying bed, and Incineration.                                                                                                               | 3 | 2 | 1 | -- |
| 14    | Case Studies for Pollution Control in Some Industries.                                                                                                                                              | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                  |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                       | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)             | 11                              | 15            | 15 %                             |
| 2   | Midterm exam                               | 7                               | 20            | 20 %                             |
| 3   | Final Written Exam                         | 15, 16                          | 40            | 40 %                             |
| 4   | Tutorial and report assessment (Term Work) | weekly                          | 25            | 25 %                             |

## 6- Learning Resources and Supportive Facilities \*

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Waste Water Recycling and Management, Sadhan Kumar Ghosh, Springer, 12302, SINGAPORE, <b>2019</b>.</li> <li>Wastewater Treatment: Concepts And Practices, Ronald Hogan, Syrawood, 12301, NEW YORK, <b>2019</b>.</li> </ul>                                                                                                                                                                                                                                        |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Water Supply and Pollution Control 7th edition; Warren Viessman, Jr. &amp; Mark J. Hamer</li> <li>Edmund Besselièvre and Others, The Treatment of Industrial Wastes, McGraw-Hill, New York, ISBN:9780070050471.</li> <li>Egyptian Code of Practice for wastewater treatment design, 1998 Ministerial decree 52/1998</li> <li>Warren Viessman, Water Supply and Pollution Control, 2009, Pearson Prentice Hall, Upper Saddle River, ISBN:9780132337175.</li> </ul> |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | <b>Supportive facilities &amp; equipment for teaching and learning *</b>                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                  | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | <b>Supplies</b>                                                                                                     | MS Team                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                  | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                  | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                  | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                  | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Fadia Salem</b>                                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                                     |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Selected Topics in Environmental Engineering</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 319</b>                                      |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                   |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                                  | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                   | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                            |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                                     |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                   |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>               |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Fadia Salem                                     |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department           |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                                  |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Providing information on the major environmental challenges facing the world, and Egypt specifically, with a focus on environmental pollution considering the different sources, effects, and treatments. Discussing water pollution, air pollution, noise pollution, solid and hazardous waste management.



### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><br><b>A3, A4, A6, B1, B2, B3</b> |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b> |                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Code</b>                                                                                                           | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                     | <b>Text</b>                                                                                                                                                                                                                                            |
| <b>A3</b>                                                                                                             | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                      | Apply sustainable cost-effective solutions based on scientific engineering principles to improve the natural environment for the development and benefit of the society.                                                                               |
| <b>A4</b>                                                                                                             | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO2</b>                      | Utilize the Egyptian environmental legislations and relevant codes of practices, in addition to the international environmental agendas and recognized best practices, to base solutions for natural environment enhancements and pollution abatement. |
| <b>A6</b>                                                                                                             | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | <b>LO3</b>                      | Evaluate the environmental pollution / deterioration magnitude considering the different types of pollution.                                                                                                                                           |
| <b>B1</b>                                                                                                             | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                      | Select appropriate sustainable cost-effective treatments and management approaches through numerical approaches.                                                                                                                                       |
| <b>B2</b>                                                                                                             | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth                                                                                                                                                                                                                                                                                                                | <b>LO5</b>                      | Design of sanitary treatment.                                                                                                                                                                                                                          |

|           |                                                                                                                                                                                                             |            |                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------|
|           | Retaining Structures; and at least three of the following civil engineering topics: Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline.       |            |                                                                 |
| <b>B3</b> | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects. | <b>LO6</b> | Assess environmental impacts of different industrial processes. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      | √          |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                       | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                        |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                        |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to Environmental Engineering and Sustainable Development. | 3                  | 2                                     | 1        | --              |

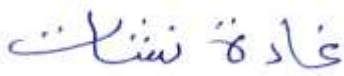
|       |                                                                                       |   |   |   |    |
|-------|---------------------------------------------------------------------------------------|---|---|---|----|
| 2     | The main environmental challenges facing the world generally, and Egypt specifically. | 3 | 2 | 1 | -- |
| 3     | Introduction to Solid Waste Management.                                               | 3 | 2 | 1 | -- |
| 4     | Solid Waste Collection.                                                               | 3 | 2 | 1 | -- |
| 5     | Solid Waste Processing and Resource Recovery.                                         | 3 | 2 | 1 | -- |
| 6     | Solid Waste Disposal.                                                                 | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                          |   |   |   |    |
| 8     | Hazardous Waste Management                                                            | 3 | 2 | 1 | -- |
| 9     | Water Pollution                                                                       | 3 | 2 | 1 | -- |
| 10    | Advanced Wastewater Treatment                                                         | 3 | 2 | 1 | -- |
| 11    | Air Pollution                                                                         | 3 | 2 | 1 | -- |
| 12    | Noise Pollution                                                                       | 3 | 2 | 1 | -- |
| 13    | Industrial Pollution                                                                  | 3 | 2 | 1 | -- |
| 14    | Pollution Prevention Technologies                                                     | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                    |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                       | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)             | <b>11</b>                       | <b>15</b>     | <b>15 %</b>                      |
| 2   | Midterm exam                               | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 3   | Final Written Exam                         | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 4   | Tutorial and report assessment (Term Work) | <b>weekly</b>                   | <b>25</b>     | <b>25 %</b>                      |

## **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• William P. Cun, Principles of Environmental, New York, 2020, McGraw Hill</li> <li>• Waste Water Recycling and Management, Sadhan Kumar Ghosh, Springer, 12302, SINGAPORE, 2019.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Environmental Technology Handbook, James G. Speight, 2020, Gulf Professional Publishing, an imprint of Elsevier, Cambridge, MA, OCLC Number / Unique Identifier: 1129385226.</li> <li>• Water Supply and Pollution Control 7th edition; Warren Viessman, Jr. &amp; Mark J. Hamer</li> <li>• Egyptian Code of Practice for wastewater treatment design, 1998 Ministerial decree 52/1998</li> <li>• K.N.Duggal, Elements Of Environmental Engineering, 2008, S. Chand, Ram Nagar, New Delhi, Isbn:9788121915472.</li> <li>• Warren Viessman, Water Supply and Pollution Control, 2009, Pearson Prentice Hall, Upper Saddle River, ISBN:9780132337175.</li> </ul> |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                  | <b>Supportive facilities &amp; equipment for teaching and learning *</b>                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                  | <b>Supplies</b>                                                                                                     | MS Team                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                  | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Dr. Fadia Salem</b>                                                            | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Steel Structures (2)</b>               |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 226</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Mohammed Fathi Belal                  |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Basic behaviour of steel structures, including both the component parts and the completed structures. Egyptian code of practice Allowable Stress Design (ASD) and American code and resistant and factor design specification LRFD (AISC). Laterally supported and unsupported Beams, Continuous Beams, Composite Design, Beam - Column Elements, Bracing Systems, Connection detailing, and stiffening. Structural systems include Rigid Frames, Floor Systems and Buildings.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                                |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A4, A10, B1, B2</b>                                                   |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                                    |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                  | <b>LO1</b>                                                         | Identify the laterally supported and unsupported beams as well as the buckling lengths of different frame elements.            |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO2</b>                                                         | Calculate the loads on a steel frame and their components design strength.                                                     |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO3</b>                                                         | Apply the design specification requirements to get the most economic cross-sections for beams.                                 |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | <b>LO4</b>                                                         | Compute the design strength for the frame component according to the Egyptian code of practice.                                |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO5</b>                                                         | Design structural connections that are integrated parts of the overall structural design.                                      |
| <b>A10</b>                                                                       | Acquire and apply new knowledge; and practice self, lifelong, and other learning strategies.                                                                                                                                                                                                                        | <b>LO6</b>                                                         | Develop student ability of to self-extract and manipulate data from different sources, textbooks, and international codes.     |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis                        | <b>LO7</b>                                                         | Utilize advanced numerical techniques like computer software packages (SAP2000 and/or ETABS) for the analysis of steel frames. |

|           |                                                                                                                                                                                                                                                                                                                                                                |            |                                                                                                           |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------|
|           | and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                                                                                                                                 |            |                                                                                                           |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO8</b> | Design structural beams and their connections that are integrated parts of the overall structural design. |
|           |                                                                                                                                                                                                                                                                                                                                                                | <b>LO9</b> | Produce design drawing necessary for cost estimation.                                                     |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    |                      | ✓                      |            |                       | ✓                  |            |                |            | ✓             |                    |                                          |              | ✓          |                 |



### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                                                                                                                             | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                                                                                                                                 |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                                                                                                                                                 |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to Steel Systems for Industrial Buildings and introduce students to the role of the teaching assistant and determine the means of communication (email, group on Teams, or WhatsApp) + Provide an introduction to the importance of linking the course to real-life projects, with brief examples. | 4                  | 2                                     | 2        | 0               |
| 2        | Design of Laterally Supported Simple Beams (ECOP) + allocate a weekly office hour for the teaching assistant + Presentation of a simple case study of a small mining project, and analysis of its basic elements.                                                                                               | 4                  | 2                                     | 2        | 0               |
| 3        | Design of Laterally Supported Simple Beams (AISC) + teaching assistant participates in correcting the quiz and discussing the results with the students and assign them to analyze a metal project of their choice.                                                                                             | 4                  | 2                                     | 2        | 0               |
| 4        | Design of Laterally Unsupported Simple Beams (ECOP) + Group discussion on design challenges in real-life projects                                                                                                                                                                                               | 4                  | 2                                     | 2        | 0               |
| 5        | Design of Laterally Unsupported Simple Beams (AISC) + Presentation of a previous graduation project and analysis of the design steps using an engineering program                                                                                                                                               | 4                  | 2                                     | 2        | 0               |
| 6        | Design of Continuous Beams (ECOP) and provide a short workshop led by the teaching assistant to solve problems.                                                                                                                                                                                                 | 4                  | 2                                     | 2        | 0               |

|       |                                                                      |   |   |   |   |
|-------|----------------------------------------------------------------------|---|---|---|---|
| 7     | <b>Revision and Mid Exam</b>                                         |   |   |   |   |
| 8     | Design of Continuous Beams (AISC)                                    | 4 | 2 | 2 | 0 |
| 9     | Design of Beam-Column Elements (ECOP)                                | 4 | 2 | 2 | 0 |
| 10    | Analysis & Design of Bracing Systems for Industrial Buildings        | 4 | 2 | 2 | 0 |
| 11    | Detailing of Building Connections (Framed Beam Connection)           | 4 | 2 | 2 | 0 |
| 12    | Detailing of Building Connections (Framed Beam Connection)           | 4 | 2 | 2 | 0 |
| 13    | Detailing of Building Connections (Column Base & Anchor Bolt Design) | 4 | 2 | 2 | 0 |
| 14    | Detailing of Building Connections (Column Base & Anchor Bolt Design) | 4 | 2 | 2 | 0 |
| 15,16 | <b>Final Exam.</b>                                                   |   |   |   |   |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 6                               | 5             | 5 %                              |
| 2   | Quiz 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Project                        | weekly                          | 20            | 20 %                             |
| 6   | Report                         | 13                              | 5             | 5 %                              |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Steel structures design, Prof. ABDELRAHIM KHALIL DESSOUKI, DAR ALMAARAF library, 12285, CAIRO, <b>2016</b>.</li> <li>DESIGN AND ANALYSIS OF CONNECTIONS IN STEEL, ALFREDO BORAC, WILEY, 12286, GERMANY, <b>2018</b>.</li> <li>DESIGN OF STEEL STRUCTURES TO EUROCODES, Ioannis Vayas, SPRINGER, 12282, N.T.U., <b>2019</b></li> <li>STRUCTURAL STEEL WORK, SUDERSHAN KUMAR, VENUS BOOK, INDIA, <b>2023</b>.</li> </ul>                                                                                                                                                                              |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Behavior, Analysis And Design Of Steel Work V1,2 and 3, El-Sayed Bahaa Machaly, DAR ALKOTB, 8334, CAIRO, 2003.</li> <li>Steel Structures, Ch.G.Salam, S CHAND, 1229:1232, N.DELHI, 1980.</li> <li>Structural Steel Design, Abraham J.R., MCGRAW H., 1152, N.YORK, 1991.</li> <li>Structural Steel Design, Joseph E. Bowles, CONGRESS, 8390, LONDON, 1992.</li> <li>Egyptian Code Of Practice For Steel Construction And Bridges (Asd &amp; Lrfd), HOUSING AND BUILDING, DAR AL KOTB, 10321, CAIRO, 2001.</li> <li>Egyptian Loading Code, HOUSING AND BUILDING, DAR AL KOTB, CAIRO, 2012.</li> </ul> |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://www.steel.org/">https://www.steel.org/</a></li> <li><a href="https://www.sciencedirect.com/journal/journal-of-constructional-steel-research">https://www.sciencedirect.com/journal/journal-of-constructional-steel-research</a></li> </ul>                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                  | <b>Supportive facilities &amp; equipment for teaching and learning *</b>                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                  | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                  | <b>Supplies</b>                                                                                                     | MS Team                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                  | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|             |                                 |                                  |
|-------------|---------------------------------|----------------------------------|
|             | <b>Course Coordinator</b>       | <b>Program Coordinator</b>       |
| <b>Name</b> | <b>Dr. Mohammed Fathi Belal</b> | <b>Dr. Ghada Nashaat Mohamed</b> |

|                  |                |           |
|------------------|----------------|-----------|
| <b>Signature</b> | M. Fathi Belal | علاء فاضل |
|------------------|----------------|-----------|

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                              |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Principals of Construction Management</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 227</b>                               |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                            |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                           | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 1                                            | 1                |                        | 2            |
| <b>Course Type:</b>                                                                                             | Compulsory                                   |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                              |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                            |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>        |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Asmaa Ahmed Soliman                      |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department    |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                           |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Introduction to principles of productivity, value engineering, financial and accounting in construction

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | Course Learning Outcomes                                    |                                                                                                          |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| A2, A3, A4, A5, A6, A10, B3, B4                                           |                                                                                                                                                                                                                                                                                                                     | Upon completion of the course, the student will be able to: |                                                                                                          |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                | Code                                                        | Text                                                                                                     |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | LO1                                                         | Identify the Express ideas in different states of cash flow.                                             |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO2                                                         | Use mathematical, and theories formulae to solve engineering problems, modelling and design              |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | LO3                                                         | Apply the different solutions of expected and unexpected technical problems related to annotated topics. |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | LO4                                                         | Describe the engineering projects and state the Cash flow analysis and financial analysis                |
| A5                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                                                                                                                                                          | LO5                                                         | Illustrate the critical path methodology under conditions of certainty.                                  |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                            | LO6                                                         | Plan and schedule engineering projects                                                                   |
| A10                                                                       | Acquire and apply new technology; and practice self; lifelong; and other learning strategies                                                                                                                                                                                                                        | LO7                                                         | Apply the different topic of planning on Primavera tool and on actual case studies                       |
| B3                                                                        | Plan and manage construction processes; address construction defects, instability and quality                                                                                                                                                                                                                       | LO8                                                         | The Knowledge of construction management, and its applications                                           |

|    |                                                                                                               |     |                                                                                                                                                         |
|----|---------------------------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | issues; maintain safety measures in construction and materials; and assess environmental impacts of projects. |     |                                                                                                                                                         |
| B4 | Deal with biddings, contracts and financial issues including project insurance and guarantees                 | LO9 | Apply the different solutions of expected and unexpected technical problems related to construction planning and delays and responsibilities of parties |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brainstorming        | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | -                    | ✓                      |            | ✓                     | -                  | -          | -              | -          | -             | -                  | -                                        | -            | -          | -               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                          | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                              |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                              |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction for construction management. Definition of engineering projects, tasks and subtasks as activity | 2                  | 1                                     | 1        | 0               |
| 2        | Networks, Principles and practices of critical path methodology under conditions of certainty (CPM)          | 2                  | 1                                     | 1        | 0               |

|    |                                                                                                                                                                                                                                                                   |   |   |   |   |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 3  | Networks, Principles and practices of critical path methodology under conditions of certainty (CPM)                                                                                                                                                               | 2 | 1 | 1 | 0 |
| 4  | Networks, Principles and practices of critical path methodology under conditions of uncertainty (PERT) + Solving practical exercises on projects. Using engineering software to analyze and plan a project and discussing questions previously asked by students. | 2 | 1 | 1 | 0 |
| 5  | Construction Project Time Control                                                                                                                                                                                                                                 | 2 | 1 | 1 | 0 |
| 6  | Construction Project Time Control + Intensive practical workshop on Primavera                                                                                                                                                                                     | 2 | 1 | 1 | 0 |
| 7  | <b>Revision and Mid Exam</b>                                                                                                                                                                                                                                      |   |   |   |   |
| 8  | Time-cost trade off concepts with and without resource limitations + Comprehensive applied assessment: Students prepare a comprehensive mini-project that includes time planning, costing, and control, with a brief report and presentation to their peers.      | 2 | 1 | 1 | 0 |
| 9  | Time-cost trade off concepts with and without resource limitations + Practical application of Cost Estimation and Cost Control: entering estimated and actual costs, analyzing variances, and generating performance reports using Primavera                      | 2 | 1 | 1 | 0 |
| 10 | Resource Management                                                                                                                                                                                                                                               | 2 | 1 | 1 | 0 |
| 11 | Cash flow analysis and financial analysis.                                                                                                                                                                                                                        | 2 | 1 | 1 | 0 |
| 12 | Cash flow analysis and financial analysis.                                                                                                                                                                                                                        | 2 | 1 | 1 | 0 |
| 13 | Cost Control of Construction Project                                                                                                                                                                                                                              | 2 | 1 | 1 | 0 |
| 14 | Cost Control of Construction Project                                                                                                                                                                                                                              | 2 | 1 | 1 | 0 |



|       |                    |
|-------|--------------------|
| 15,16 | <b>Final Exam.</b> |
|-------|--------------------|

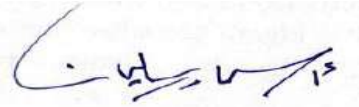
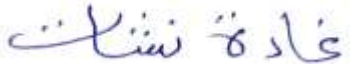
**5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            | 2                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work)            | 6                               | 10            | 10 %                             |
| 3   | Exam 3 written (Semester work)            | 12                              | 10            | 10 %                             |
| 4   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 5   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 6   | Assignments / Project /Portfolio/ Logbook | 10                              | 10            | 10 %                             |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Construction Project Management Theory and Practice, Larry Mckenzie, Kaufman Press Library, 12355, U.S.A, <b>2024</b>.</li> <li>Civil Engineering: Building Materials Properties, Cayson Carter, Murphy &amp; Moore Library, 12375, New York, <b>2023</b>.</li> <li>Project Management Techniques In Planning; H. N. Ahuja, 1994, Publisher John Wiley &amp; Sons Inc, Isbn (0471591688).</li> <li>Project Management For Engineering, Garold D. Obirlender, Butterworth Library, 8449, N.York, 1995.</li> </ul> |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Introduction to Construction Management; Fred Sherratt, 2015, Routledge Publishing ,ISBN (9781032007441)</li> <li>Handbook of Construction Management: Scope, Schedule, and Cost Control; Abdul Razzak Ruman; 2016, Publisher CRC Press, ISBN (1482226642)</li> </ul>                                                                                                                                                                                                                                            |

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <ul style="list-style-type: none"> <li>• Construction Management: Theory and Practice; Chris March; 2017, Routledge Publishing ,ISBN (9781138694477)</li> <li>• International Construction Management: How the Global Industry Reshapes the World; Igor Martek; 2022. Routledge Publishing ,ISBN (9780367563622)</li> </ul>                                           |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li>• <a href="https://www.cmaanet.org/">Construction Management Association of America;</a> <a href="https://www.cmaanet.org/">https://www.cmaanet.org/</a> (1982-now)</li> <li>• <a href="https://www.pmi.org/">Project Management Institute;</a> <a href="https://www.pmi.org/">https://www.pmi.org/</a> (1969- now)</li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Projector- White board- Personal Computer- Microsoft Team                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Supplies</b>                                    | Lecture notes                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Other (to be mentioned)</b>                     | --                                                                                                                                                                                                                                                                                                                                                                    |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Asmaa Ahmed Soliman</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Project Management</b>                 |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>MNG 201</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | <b>Mechanical Engineering</b>             |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | <b>2</b>                                  | <b>1</b>         | <b>--</b>              | <b>3</b>     |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | <b>Mechanical Engineering</b>             |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Dr. Asmaa Ahmed Soliman</b>            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | 8/12/2025                                 |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Project management overview, organizational structures, assessing success, planning, learning curves, network scheduling techniques, CPM analysis, precedence networking, resource allocation and constraints, cost management, risk management, project performance measurement and control.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                | Course Learning Outcomes                                           |                                                                                                                                       |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>A7, A9 &amp; A10</b>                                                   |                                                                                                                                                | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                       |
| <b>Code</b>                                                               | <b>Text</b>                                                                                                                                    | <b>Code</b>                                                        | <b>Text</b>                                                                                                                           |
| <b>A7</b>                                                                 | Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.                                          | <b>LO1</b>                                                         | Identify the fundamental concepts and phases of project management.                                                                   |
|                                                                           |                                                                                                                                                | <b>LO2</b>                                                         | Explain the role of organizational strategy in project selection and prioritization.                                                  |
|                                                                           |                                                                                                                                                | <b>LO3</b>                                                         | Describe how an organization's mission, vision, and strategy influence project planning.                                              |
| <b>A9</b>                                                                 | Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations. | <b>LO4</b>                                                         | Develop project network schedules using techniques such as Critical Path Method (CPM) and Program Evaluation Review Technique (PERT). |
|                                                                           |                                                                                                                                                | <b>LO5</b>                                                         | Apply core project management principles to minimize project duration and mitigate risks.                                             |
|                                                                           |                                                                                                                                                | <b>LO6</b>                                                         | Analyze the impact of risk management processes on project outcomes.                                                                  |
| <b>A10</b>                                                                | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.                                                    | <b>LO7</b>                                                         | Schedule project resources and associated costs using appropriate tools.                                                              |
|                                                                           |                                                                                                                                                | <b>LO8</b>                                                         | Recognize the different methods for project resource allocation.                                                                      |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | ✓                    | -                      | -          | -                     | ✓                  | -          | -              | -          | -             | -                  | -                                        | -            | -          | ✓               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                             | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                 |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                                                 |                    |                                       | Tutorial | Practical Lab / |
| 1        | Introduction for project management                                                                                                             | 3                  | 2                                     | 1        | 0               |
| 2        | Organization strategy and project selection                                                                                                     | 3                  | 2                                     | 1        | 0               |
| 3        | Work Breakdown structure (WBS), Organization Breakdown Structure (OBS), Activity & Scope, Planning Process and Time management Project Planning | 3                  | 2                                     | 1        | 0               |
| 4        | Activities Duration, Activities Sequence, Project Networks.<br>Gantt Chart (Bar Chart) and Solved Examples on Bar chart (Gant Chart(            | 3                  | 2                                     | 1        | 0               |
| 5        | Activity On Arrow (AOA) and Solved Examples on Activity on Arrow (AOA)                                                                          | 3                  | 2                                     | 1        | 0               |
| 6        | Activity On Node (AON) and Solved Examples on Activity on Node                                                                                  | 3                  | 2                                     | 1        | 0               |
| 7        | <b>Revision and Mid Exam</b>                                                                                                                    |                    |                                       |          |                 |
| 8        | Managing Project Risk                                                                                                                           | 3                  | 2                                     | 1        | 0               |
| 9        | Scheduling Resources and Costs                                                                                                                  | 3                  | 2                                     | 1        | 0               |

|       |                                             |   |   |   |   |
|-------|---------------------------------------------|---|---|---|---|
| 10    | Applicable Examples on Scheduling Resources | 3 | 2 | 1 | 0 |
| 11    | Reducing Project Duration                   | 3 | 2 | 1 | 0 |
| 12    | Cost–Duration Trade-off examples            | 3 | 2 | 1 | 0 |
| 13    | Cost–Duration Trade-off examples            | 3 | 2 | 1 | 0 |
| 14    | Revision                                    | 3 | 2 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                          |   |   |   |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work or quiz)    | 3                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work or quiz)    | 5                               | 10            | 10 %                             |
| 3   | Exam 3 written (Semester work or quiz)    | 10                              | 10            | 10 %                             |
| 4   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 5   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 6   | Assignments / Project /Portfolio/ Logbook | 12                              | 10            | 10 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | 1. Ravi V. Industrial Engineering and Management. PHI Learning Pvt. Ltd.; 2015 Aug 31.<br>2. Baudin, M., & Netland, T. (2022). Introduction to manufacturing: An industrial engineering and management perspective. Routledge. |
|                                                                  | <b>Other References</b>                                                                                             | 1. Cardona-Meza LS, Olivar-Tost G. Modeling and simulation of project management through the PMBOK® standard using complex networks. Complexity. 2017;2017(1):4791635.                                                         |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | N/A                                                                                                                                                                                                                            |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                         |
| <b>Supportive facilities &amp; equipment for teaching</b>        | <b>Devices/Instruments</b>                                                                                          | <b>Data show- Dashboard</b>                                                                                                                                                                                                    |
|                                                                  | <b>Supplies</b>                                                                                                     | N/A                                                                                                                                                                                                                            |
|                                                                  | <b>Electronic Programs</b>                                                                                          | <b>Microsoft teams</b>                                                                                                                                                                                                         |
|                                                                  | <b>Skill Labs/ Simulators</b>                                                                                       | N/A                                                                                                                                                                                                                            |
|                                                                  | <b>Virtual Labs</b>                                                                                                 | N/A                                                                                                                                                                                                                            |
|                                                                  | <b>Other (to be mentioned)</b>                                                                                      | N/A                                                                                                                                                                                                                            |

|                   |  |  |
|-------------------|--|--|
| and<br>learning * |  |  |
|-------------------|--|--|

|           | Course Coordinator                                                                | Program Coordinator                                                                 |
|-----------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Name      | Dr. Asmaa Ahmed Soliman                                                           | Dr. Mohamed Ashraf                                                                  |
| Signature |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Surveying (3)</b>                      |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 221</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                              |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Introduction to Theory of Errors and Error Analysis of Surveying Measurements. Coordinate Systems and Transformations. Coordinate Computations: polar method, intersection, and resection. Modern Methods for Distance Measurements: Electronic Distance Measurement (EDM) and total stations. Setting out of Engineering Projects.



### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>(A1, A10, and B1)</b>                                                         |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                    |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.                                                                                                                                                                                                                                                                            | <b>LO1</b>                                                         | Identify the traversing computation and solve the connected traverse.                                                          |
| <b>A10</b>                                                                       | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.                                                                                                                                                                                                                                                                                                                 | <b>LO2</b>                                                         | practice the different methods to measure the geodetic coordinate, and applying the processes of setting out the Co-ordinates. |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                                                         | Achieve an optimum method to measure the geodetic coordinate.                                                                  |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      |            |                       | √                  | √          |                | √          | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                      | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                          |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                          |                    |                                       | Tutorial | Practical / Lab |
| 1        | Define the direct and indirect method to compute coordinates.                                                                                                                            | 3                  | 2                                     | 0        | 1               |
| 2        | Define the classification of triangulation framework and adjustment.                                                                                                                     | 3                  | 2                                     | 0        | 1               |
| 3        | Define the using EDM and Total station.                                                                                                                                                  | 3                  | 2                                     | 0        | 1               |
| 4        | Define the sphere, spherical triangle and its parameters and inclusion of a unit entitled "Introduction to Geographic Information Systems (GIS)".                                        | 3                  | 2                                     | 0        | 1               |
| 5        | Define the spherical excess and convergence of meridian and Inclusion of a unit entitled "Modern Surveying Technologies: Applications and Opportunities" and view educational videos and | 3                  | 2                                     | 0        | 1               |

|       |                                                                                                                                                                                                                           |   |   |   |   |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|       | real-life projects that demonstrate the use of GIS in surveying.                                                                                                                                                          |   |   |   |   |
| 6     | Define the sources and kinds of errors and its correction and organize a hands-on training session on GIS software (such as QGIS).                                                                                        | 3 | 2 | 0 | 1 |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                                              |   |   |   |   |
| 8     | Define the weighted error and its corrections and showcase real-life videos and projects using drones and LiDAR and organizing a workshop in cooperation with an external party to demonstrate modern devices in practice | 3 | 2 | 0 | 1 |
| 9     | Define the GPS and there uses                                                                                                                                                                                             | 3 | 2 | 0 | 1 |
| 10    | Defining and calculation of coordinates of occupied and unoccupied station, transformation and assign students an applied project using and analyzing GPS or EDM data.                                                    | 3 | 2 | 0 | 1 |
| 11    | Defining and calculation the conditions of the figure of triangulation                                                                                                                                                    | 3 | 2 | 0 | 1 |
| 12    | Defining and application the temporary and permanent adjustment of total station.                                                                                                                                         | 3 | 2 | 0 | 1 |
| 13    | Defining and calculation the coordinates of position using GPS.                                                                                                                                                           | 3 | 2 | 0 | 1 |
| 14    | Final Practical exam.                                                                                                                                                                                                     | 3 | 2 | 0 | 1 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                                        |   |   |   |   |

### **Experiment Topics: (If any)**

| Serial | Experiment                                                       |
|--------|------------------------------------------------------------------|
| 1      | Plan the student in how to compute and set control points.       |
| 2      | Plan the student in how to adjustment the triangulation network. |

|   |                                                                                     |
|---|-------------------------------------------------------------------------------------|
| 3 | Plan the student in how to use Total station instrument.                            |
| 4 | Plan the student in how to adjust the spherical triangle.                           |
| 5 | Training the student in how to compute the coordinates of stations on the spheroid. |
| 6 | Plan the student in how to adjust the survey observations using theory of errors    |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 4                               | 5             | 5 %                              |
| 2   | Quiz 2 written (Semester work) | 11                              | 5             | 5 %                              |
| 3   | Midterm exam                   | 7                               | 30            | 30 %                             |
| 4   | Final Written Exam             | 15, 16                          | 30            | 30 %                             |
| 5   | Final Practical Exam           | 14                              | 10            | 10 %                             |
| 6   | Final Oral Exam                | -                               | 0             | 0 %                              |
| 7   | Assignments / Report           | 1:13                            | 5             | 5 %                              |
| 8   | Field training                 | 1:13                            | 15            | 15 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | - Duggal, S.K., "Surveying", Volume 2, ISBN-10: 9353167523, MC Graw Hill India, 2018.                                                                                                                                                                                                                                                                                       |
|                                                                  | <b>Other References</b>                                                                                             | - A., AGOR, "A Textbook of Advanced Surveying", Khanna Publishers, 2002.<br><br>- Dr. B. C. Punmia, Ashok, K. J., Arun, K. J.   Laxmi "Surveying Volume 2", 8th Edition, National Institute of Technology Goa Farmagudi, Ponda, Goa - 403 401, 2018.<br><br>- Bannister, A., Raymond, S. and Baker, R., "Surveying", 6th Edition, ISBN 10: 0582302498, Prentice Hall, 1998. |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://htiedu-my.sharepoint.com/:f/q/person/ramy_mostafa_hti_edu_eg/Etlfyl-A5_NCuMXwthLkq-IBCCWeonxZqAA9K2uqcFDMyg?e=jryhcf">https://htiedu-my.sharepoint.com/:f/q/person/ramy_mostafa_hti_edu_eg/Etlfyl-A5_NCuMXwthLkq-IBCCWeonxZqAA9K2uqcFDMyg?e=jryhcf</a>                                                                                                     |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                      |

|                                                                          |                                |                          |
|--------------------------------------------------------------------------|--------------------------------|--------------------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>     | Total station instrument |
|                                                                          | <b>Supplies</b>                | --                       |
|                                                                          | <b>Electronic Programs</b>     | --                       |
|                                                                          | <b>Skill Labs/ Simulators</b>  | --                       |
|                                                                          | <b>Virtual Labs</b>            | --                       |
|                                                                          | <b>Other (to be mentioned)</b> | <b>How to use GPS</b>    |

|                  |                           |                                  |
|------------------|---------------------------|----------------------------------|
|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b>       |
| <b>Name</b>      | <b>Dr. Amr Nada</b>       | <b>Dr. Ghada Nashaat Mohamed</b> |
| <b>Signature</b> | د/ عمرو عبدالغنى          | غادة نشأت                        |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Sanitary Engineering (1)</b>           |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 222</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 3                |                        | 5            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Fadia Salem                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Introduction to water supply works: sources of water, water quality, rate of water consumption, preliminary studies to estimate water demands. Collection works: types of intakes, location, and design of low lift pumps. Water treatment works: coagulation, clarification, filtration, disinfection, and softening. Storage works: elevated and ground storage. Water distribution works: high lift pumps, design of distribution networks using methods: equivalent pipe method, method of sections, and circle method.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS) (according to the matrix in the program specs.)</b> |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                 |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>(A2, A3, A4, B1, B2)</b>                                                    |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                 |
| <b>Code</b>                                                                    | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                     |
| A2                                                                             | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | LO1                                                                | Enable the student to calculate and predict the ultimate water treatment and distribution networks' capacities. |
| A3                                                                             | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | LO2                                                                | Develop the student's understanding of water treatment processes to design sustainable cost-effective systems.  |
| A4                                                                             | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety                                                                                                                                                                                                           | LO3                                                                | Develop the student's Engineering design capabilities for water                                                 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                                                                                                                          |     | treatment works and distribution systems according to the latest literature and codes of practice.                                                               |
| B1 | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO4 | Enable the student to select the optimum water treatment and distribution technologies to ensure the provision of safe treated water to the different consumers. |
| B2 | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.                                              | LO5 | Prepare the student to design and plan water treatment plants and distribution systems                                                                           |



#### 4-Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology- Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|-------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                       | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                | √          | √             |                    |                                           |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                    | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                        |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                        |                    |                                       | Tutorial | Practical / Lab |
| 1        | Preliminary studies for water supply projects                                                          | 5                  | 2                                     | 2        | 1               |
| 2        | Population and water consumption                                                                       | 5                  | 2                                     | 2        | 1               |
| 3        | Water Collection                                                                                       | 5                  | 2                                     | 2        | 1               |
| 4        | Water Quality and Providing a theoretical introduction to the software used in sanitary network design | 5                  | 2                                     | 2        | 1               |
| 5        | Plain Sedimentation                                                                                    | 5                  | 2                                     | 2        | 1               |
| 6        | Plain Sedimentation (Cont.) + Quiz 1 + organizing a training workshop on WaterCAD or SewerCAD          | 5                  | 2                                     | 2        | 1               |

|       |                                                                                                                          |   |   |   |   |
|-------|--------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|       |                                                                                                                          |   |   |   |   |
| 7     | Revision + Midterm Exam                                                                                                  |   |   |   |   |
| 8     | Chemical Sedimentation + assign students a mini-project to design a water or sewer network for a hypothetical area.      | 5 | 2 | 2 | 1 |
| 9     | Filtration + organizing a field trip to a treatment plant or network project in cooperation with an implementing agency. | 5 | 2 | 2 | 1 |
| 10    | Disinfection and ground storage                                                                                          | 5 | 2 | 2 | 1 |
| 11    | Disinfection and ground storage (Cont.) + Quiz 2 + discuss project results and link them to field observations.          | 5 | 2 | 2 | 1 |
| 12    | High lift pumps and elevated tanks                                                                                       | 5 | 2 | 2 | 1 |
| 13    | Pipe Networks                                                                                                            | 5 | 2 | 2 | 1 |
| 14    | Pipe Networks (Cont.)                                                                                                    | 5 | 2 | 2 | 1 |
| 15,16 | Final Exam                                                                                                               |   |   |   |   |

### **Experiment Topics:**

| Serial | Experiment |
|--------|------------|
| 1      | BOD Test   |
| 2      | COD Test   |
| 3      | DO Test    |

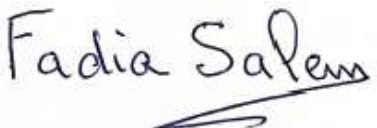
### **5- Methods of students' assessment:**

| No. | Assessment Methods * | Assessment Timing | Marks/ Scores | Percentage of |
|-----|----------------------|-------------------|---------------|---------------|
|-----|----------------------|-------------------|---------------|---------------|

|   |                                            | (Week Number) |    | total course Marks |
|---|--------------------------------------------|---------------|----|--------------------|
| 1 | Quiz 1 written (Semester work)             | 11            | 15 | 15%                |
| 2 | Midterm exam                               | 7             | 20 | 20 %               |
| 3 | Final Written Exam                         | 15, 16        | 40 | 40 %               |
| 4 | Final Practical                            | 13            | 5  | 5%                 |
| 5 | Tutorial and report assessment (Term Work) | weekly        | 20 | 20%                |

### 6- Learning Resources and Supportive Facilities

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <b>Claud E. Boyd, Water Quality: An Introduction, Switzer, 2020, Springer</b>                                                                                                                                                                       |
|                                                                          | <b>Other References</b>                                                                                             | <b>Water Works Engineering, Planning, design and operations, Syed R. Qasim, Edward M. Motley, Guang Zhu</b><br><br><b>WARREN VIESSMAN, WATER SUPPLY AND POLLUTION CONTROL, 2009, Pearson Prentice Hall, Upper Saddle River, ISBN:9780132337175.</b> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                                  |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKP – Microsoft Office                                                                                                                                                                                                                              |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board, Laptop                                                                                                                                                                                                                      |
|                                                                          | <b>Supplies</b>                                                                                                     | Power point lectures.                                                                                                                                                                                                                               |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                  |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                  |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                  |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | BOD Test, COD Test                                                                                                                                                                                                                                  |

|           | Course Coordinator                                                                | Program Coordinator                                                                 |
|-----------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Name      | Dr. Fadia Salem                                                                   | Dr. Ghada Nashaat Mohamed                                                           |
| Signature |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                                  |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Inland Navigation and Harbour Engineering</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 223</b>                                   |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                               | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                       |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                                  |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>            |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                          |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department        |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                               |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Basic Design Control: Motion of Vehicles, Sight Distances, Alignment, Intersections.  
Earthwork: Soil Classification, Soil Stabilization, Flexible and Rigid Pavements, Highway Drain. Introduction to Airport Engineering.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                | <b>Course Learning Outcomes</b>                                    |                                                                                                                          |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>A3, A6, A8, B2</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                          |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                    | <b>Code</b>                                                        | <b>Text</b>                                                                                                              |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                            | <b>LO1</b>                                                         | Study Wind rose, Tides and sea currents, explain the Wave impact on walls.                                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Design Break water and berths                                                                                            |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                       | <b>LO3</b>                                                         | Plan a harbor with different items of harbor master planning design - Navigational channel design - Turning basin design |
| <b>A8</b>                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                                                                                                                                                                                                                                           | <b>LO4</b>                                                         | Study the wave diffraction using Graphical wave diffraction.                                                             |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO5</b>                                                         | Achieve an optimum design of Harbors.                                                                                    |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       | √                  |            |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                    |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                    |                    |                                       | Tutorial | Practical / Lab |
| 1        | <b>Introduction to harbour engineering</b><br>(Definition - Harbour different parts - Factors affecting on harbour design)                                         | 3                  | 2                                     | 1        | 0               |
| 2        | <b>Wind study</b><br>(Wind definition -Importance of wind study - Different methods for wind rose)                                                                 | 3                  | 2                                     | 1        | 0               |
| 3        | <b>Tides and sea currents</b><br>(Introduction- Importance of tides and sea currents - Definitions of tides and sea currents - Sea currents measurement methods ). | 3                  | 2                                     | 1        | 0               |

|    |                                                                                                                                                                                                                                                                                |   |   |   |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 4  | <b>Wave diffraction</b><br>(Introduction to wave diffraction-<br>Wave diffraction definition<br>Graphical wave diffraction method                                                                                                                                              | 3 | 2 | 1 | 0 |
| 5  | <b>Wave diffraction</b><br>(Introduction to wave diffraction-<br>Wave diffraction definition -<br>Graphical wave diffraction method                                                                                                                                            | 3 | 2 | 1 | 0 |
| 6  | <b>Wave impact on walls</b><br>(introduction - Wave impact<br>assumptions - Different analytical<br>methods of wave impact )                                                                                                                                                   | 3 | 2 | 1 | 0 |
| 7  | <b>Revision and Mid Exam</b>                                                                                                                                                                                                                                                   |   |   |   |   |
| 8  | <b>Wave impact on walls</b><br>(introduction - Wave impact<br>assumptions - Different analytical<br>methods of wave impact –<br>Buoyancy – Center of buoyancy –<br>Meta-centre – Meta-centric<br>height–Conditions of equilibrium<br>of a floating body)                       | 3 | 2 | 1 | 0 |
| 9  | <b>Harbour master planning</b><br>(Factors affecting on harbour<br>master planning design - Different<br>items of harbour master planning<br>design - Navigational channel<br>design- Turning basin design -<br>Analytical method for calculating<br>number of harbour berths) | 3 | 2 | 1 | 0 |
| 10 | <b>Harbour master planning</b><br>(Factors affecting on harbour<br>master planning design - Different<br>items of harbour master planning<br>design - Navigational channel<br>design- Turning basin design -<br>Analytical method for calculating<br>number of harbour berths) | 3 | 2 | 1 | 0 |
| 11 | <b>Break water design</b><br>(Importance of break water design<br>- Factors affecting on break water<br>planning- Different types of break<br>water- Factors affecting on<br>choosing break water type -<br>Graphical and analytical method of<br>ripple break water design )  | 3 | 2 | 1 | 0 |
| 12 | <b>Shed design Quay wall design</b><br>(Introduction - Graphical and                                                                                                                                                                                                           | 3 | 2 | 1 | 0 |



|       |                                                                                                                                                                                                                     |   |   |   |   |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|       | analytical method of quay wall design (block type).                                                                                                                                                                 |   |   |   |   |
| 13    | <b>shore protection</b><br>(Introduction to sedimentation and erosion - Different types of shore line shape - Different shore protection methods - Analytical method of groins design (system of shore protection)) | 3 | 2 | 1 | 0 |
| 14    | Revision                                                                                                                                                                                                            | 3 | 2 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                                  |   |   |   |   |

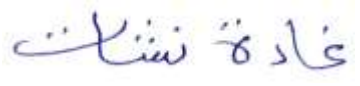
### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 6                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments                    | weekly                          | 20            | 20 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <p><b>The main (essential) reference</b><br/>(must be written in full according to the scientific documentation method)</p> <ul style="list-style-type: none"> <li>• Agerschou, H., Lundgren, H., and Sorensen, T. (1983) "Planning and Design of Ports and Marine Terminals"</li> <li>• Dean, R. and Dalrymple, R. A. (1984) "Wave Mechanics for Engineers and Scientists"</li> <li>• Abou Seida, M. M. (2002) "Introduction to Coastal and Harbor Engineering" Faculty of Engineering, Cairo University.</li> <li>• El Mongy, A. (1994) "Natural Phenomena Affecting Harbor and Coastal Process" Faculty of Engineering, Ain Shams University</li> </ul> |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <ul style="list-style-type: none"> <li>Heikal, E. M. (2003) "Lectures Notes on Harbor Engineering and Marine Structures" Faculty of Engineering, Zagazig University</li> </ul>                                              |
|                                                                          | <b>Other References</b>                            | <ul style="list-style-type: none"> <li>A. Pecher and J.P. Kofoed (2017.), Handbook of Ocean Wave Energy, Ocean Engineering &amp; Oceanography 7, DOI 10.1007/978-3-319-39889-1_4 , SBN 978-3-319-39889-1 (eBook)</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | --                                                                                                                                                                                                                          |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                      |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board                                                                                                                                                                                                      |
|                                                                          | <b>Supplies</b>                                    | MS Team                                                                                                                                                                                                                     |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                          |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                          |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                          |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Irrigation works Design (1)</b>        |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 224</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 3                |                        | 5            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Canals and Drains: Classification, Synoptic Diagrams, Design of cross and Longitudinal Sections. Culverts: Hydraulic and Structural Design. Small Bridges for Irrigation Works: Hydraulic and Structural Design. Intermediate and Tail Escapes.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                      |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>A3, A4, A6, B1, B2</b>                                                        |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                      |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                          |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                                                         | Methodologies of solving engineering problems, data collection and interpretation.                                   |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | The principles of sustainable design and development.                                                                |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | Principles of design including elements design, process and/or a system related to Civil Engineering.                |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO4</b>                                                         | Utilize the limitations and parameters of designs the structures                                                     |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | <b>LO5</b>                                                         | Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO6</b>                                                         | Solve engineering problems, often on the basis of limited and possibly contradicting information.                    |

|           |                                                                                                                                                                                                                                                                                                                                                                |            |                                                                                     |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------|
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO7</b> | Select appropriate solutions for engineering problems based on analytical thinking. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      |            | √                     | √                  | √          |                |            | √             |                    | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                       | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                        |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                        |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to canals and drains.                                     | 5                  | 2                                     | 2        | 1               |
| 2        | Alignment of Canal, new problem sets ,guided problem-solving sessions. | 5                  | 2                                     | 2        | 1               |
| 3        | Alignment of Drains                                                    | 5                  | 2                                     | 2        | 1               |

|       |                                                                                                           |   |   |   |   |
|-------|-----------------------------------------------------------------------------------------------------------|---|---|---|---|
| 4     | Synoptic Diagram for canals + Quiz,<br><a href="#">new problem sets</a> ,guided problem-solving sessions. | 5 | 2 | 2 | 1 |
| 5     | Synoptic Diagram for drains.                                                                              | 5 | 2 | 2 | 1 |
| 6     | Rotations for Canals + Quiz                                                                               | 5 | 2 | 2 | 1 |
| 7     | <b>Revision and Mid Exam</b>                                                                              |   |   |   |   |
| 8     | Design of Cross Section for drains.                                                                       | 5 | 2 | 2 | 1 |
| 9     | Design of longitudinal section                                                                            | 5 | 2 | 2 | 1 |
| 10    | Hydraulic design for bridge.                                                                              | 5 | 2 | 2 | 1 |
| 11    | Structure design of bridge + Quiz                                                                         | 5 | 2 | 2 | 1 |
| 12    | Hydraulic design for Culvert                                                                              | 5 | 2 | 2 | 1 |
| 13    | Structure design for Culvert + Quiz                                                                       | 5 | 2 | 2 | 1 |
| 14    | Design of Cross Section for drains.                                                                       | 5 | 2 | 2 | 1 |
| 15,16 | <b>Final Exam.</b>                                                                                        |   |   |   |   |

### **Experiment Topics: (If any)**

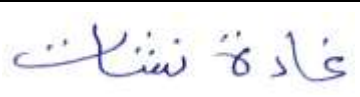
| Serial | Experiment                                   |
|--------|----------------------------------------------|
| 1      | Experimental work for open channel hydraulic |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 11                              | 10            | 10 %                             |
| 2   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 3   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 4   | Assignments / Project          | Weekly                          | 25            | 25%                              |
| 5   | Final Practical                | 13                              | 5             | 5 %                              |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>S.K. Sharma, Hydraulic Structures Design of Irrigation Structures, RSM Press, ISBN-13: 978-9352533770, January 2017.</li> <li>K Subramanya, Engineering Water, Tata McGraw-Hill, 3rd Ed., 2008.</li> <li>Hydraulic Structures, Fourth Edition by P. Novak, A.I.B. Moffat, et al., Feb 25, 2007.</li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Nazeih Assaad Younan, Design Textbooks in Civil Engineering – Irrigation Structures.</li> <li>Design of Irrigation structures, by Prof. Dr. Ayman Elsellawy and Ass. Prof. Dr. Amir Mobasher, AlAzhar University</li> </ul>                                                                                |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>WWW. Irrigation Structures.</li> </ul>                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                                                                                            |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                              |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Structural Analysis and Mechanics (4)</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 225</b>                               |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                            |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                           | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                            | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                   |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                              |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                            |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>        |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan               |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department    |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                           |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Studying influence lines analysis under moving loads, for statically determinate structures. Calculating structural deformations for statically determinate for beams, trusses, arches, and frames. Using virtual work method, double integration method, and conjugate beam method. Effect of temperature and support settlement loading on determinate structure.



### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                          |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A9 &amp; B1</b>                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                          |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                              |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Facilitate the solutions of different types of indeterminate structures and to obtain the internal forces diagrams and reactions by alternative methods. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Ability to choose the suitable technique to calculate the reactions, shear force and bending moment diagrams for statically indeterminate structures.    |
| <b>A9</b>                                                                        | Use creative innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                                | <b>LO3</b>                                                         | Choose the creative solution for analysis indeterminate structures.                                                                                      |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO4</b>                                                         | The ability to analyze indeterminate structures manually by choosing the most appropriate method from several ones.                                      |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Applying a full range of civil engineering concept and techniques by structure analysis.                                                                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO6</b>                                                         | Distinguish properties technology for construction analysis by structural analysis.                                                                      |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            | √                     | √                  |            |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                            | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                                |                    |                                       | Tutorial | Practical / Lab |
| 1        | Evaluation of structural degree of indeterminacy.                                                                                                                                              | 3                  | 2                                     | 1        | ----            |
| 2        | Solution of indeterminate beams by the consistent deformations method.                                                                                                                         | 3                  | 2                                     | 1        | ----            |
| 3        | Solution of indeterminate frames by the consistent deformations method.                                                                                                                        | 3                  | 2                                     | 1        | ----            |
| 4        | Solution of indeterminate trusses by the consistent deformations method and develop a diverse set of examples in collaboration with practicing engineers or from previous graduation projects. | 3                  | 2                                     | 1        | ----            |
| 5        | Solution of special indeterminate problems by the consistent deformations method.                                                                                                              | 3                  | 2                                     | 1        | ----            |
| 6        | Solution of indeterminate frames by the slope deflections method.                                                                                                                              | 3                  | 2                                     | 1        | ----            |

|       |                                                                                                                                                                                                               |   |   |   |      |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|------|
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                                  |   |   |   |      |
| 8     | Solution of indeterminate closed frames by the slope deflections method and allocate a portion of the lectures to explain how to use programs in analyzing structures, and link them to theoretical examples. | 3 | 2 | 1 | ---- |
| 9     | Solution of indeterminate closed frames by the slope deflections method under various types of loads.                                                                                                         | 3 | 2 | 1 | ---- |
| 10    | Solution of indeterminate beams by the moment distribution method.                                                                                                                                            | 3 | 2 | 1 | ---- |
| 11    | Solution of indeterminate frames by the moment distribution method.                                                                                                                                           | 3 | 2 | 1 | ---- |
| 12    | Shear stresses in thin-walled sections due to shear force.                                                                                                                                                    | 3 | 2 | 1 | ---- |
| 13    | Shear flow and shear center.                                                                                                                                                                                  | 3 | 2 | 1 | ---- |
| 14    | Shear stresses in thin-walled sections due to torsion moment.                                                                                                                                                 | 3 | 2 | 1 | ---- |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                            |   |   |   |      |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 3                               | 10            | 10 %                             |
| 2   | Quiz 2 written (Semester work) | 10                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments                    | weekly                          | 20            | 20 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Theory of structures Vol. 2, El-Dakhakhni, Dar El-Maaref, Cairo – <b>2018</b></li> <li>STRUCTURAL ANALYSIS, ASLAM KASSIMALI, CRC PRESS, 12289, N.YORK, <b>2020</b></li> </ul>                          |
|                                                                          | <b>Other References</b>                                                                                             | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="http://www.experiencefestival.com/structural_analysis_-_mechanics_of_materials_methods">http://www.experiencefestival.com/structural_analysis_-_mechanics_of_materials_methods</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                            |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                            |
|------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Morcos Farid Samaan</b>                                               | <b>Dr. Ghada Nashaat Mohamed</b>                                                      |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Field Training (3)</b>                 |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>FTR 231</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | --                                        | 18               |                        | 18           |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 1</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed abd Ellatief                    |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

The student shall be trained to control the work and manage its different stages on site with the following: Communicate with different types of workers; Reviewing quantities, prices and quality control; Training to read drawings and apply it on site, Planning and management of the site to guarantee to finish all works on time

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>A2, A9, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                    |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Manages the various stages of construction on the site.                                                        |
| <b>A9</b>                                                                        | Use creative innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Applies of quality control. For quantities and categories.                                                     |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                                                         | Applies a full range of civil engineering concepts, techniques and project management in the construction site |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO4</b>                                                         | Distinguish properties technology for construction analysis by construction methods.                           |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO5</b>                                                         | Study different materials and implementation of finishing works for various structural elements.               |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
|                    |                      |                      |                        |            |                       | √                  |            | √              | √          |               |                    |                                          |              |            |                 |

#### Course Schedule:

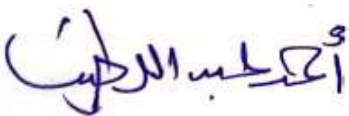
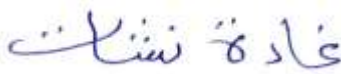
| Week No. | Scientific content of the course<br>(Course Topics)                                                                       | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|---------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                           |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                           |                    |                                       | Tutorial | Practical / Lab |
| 1        | Organizing work and how to manage the different stages on the site.                                                       | 18                 | --                                    | --       | 18              |
| 2        | Study quantities and categories and methods of quality control.                                                           | 18                 | --                                    | --       | 18              |
| 3        | <b>Revision and Mid Exam</b>                                                                                              |                    |                                       |          |                 |
| 4        | Reading the executive boards (architectural construction) and apply them to the site and planning and project management. | 18                 | --                                    | --       | 18              |
| 5        | Preparing and planning the site to ensure that work is completed on time.                                                 | 18                 | --                                    | --       | 18              |
| 6        | <b>Final Exam.</b>                                                                                                        |                    |                                       |          |                 |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            | --                              | --            | --                               |
| 2   | Exam 2 written (Semester work)            | --                              | --            | --                               |
| 3   | Midterm exam                              | 3                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | --                              | --            | --                               |
| 5   | Final Practical/Clinical/... Exam         | --                              | --            | --                               |
| 6   | Final Oral Exam                           | 6                               | 30            | 30%                              |
| 7   | Assignments / Project /Portfolio/ Logbook | 5                               | 25            | 25 %                             |
| 8   | Field training                            | Weekly                          | 25            | 25%                              |

**6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                        |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | • -----                |
|                                                                          | <b>Other References</b>                                                                                             | • -----                |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | • -----                |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          |                        |
|                                                                          | <b>Supplies</b>                                                                                                     |                        |
|                                                                          | <b>Electronic Programs</b>                                                                                          | <b>Auto cade</b>       |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       |                        |
|                                                                          | <b>Virtual Labs</b>                                                                                                 |                        |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      |                        |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Dr. Ahmed abd Ellatief</b>                                                       | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |



|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |             |      |      |                                                                 |
|----------------------------|-------------|------|------|-----------------------------------------------------------------|
| حقوق الإنسان               |             |      |      | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| HUM 205                    |             |      |      | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |             |      |      | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| إجمالي                     | أخرى (تحدد) | عملي | نظري | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 1                          |             |      | 1    |                                                                 |
| اجباري                     |             |      |      | نوع المقرر:                                                     |
| SENIOR 2                   |             |      |      | المستوى الدراسي الذي قدم فيه المقرر:                            |
| البرامج الهندسية           |             |      |      | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |             |      |      | المعهد:                                                         |
| أ.م.د. وليد رضوان          |             |      |      | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |             |      |      | جهة مناقشة واعتماد تقرير المقرر:                                |
| 7/26/2025                  |             |      |      | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

الالام بأهمية حقوق الإنسان والنشأة التاريخية لتلك الحقوق والمدارس الفقهية لتأصل تلك الحقوق وأحكام الاتفاقيات الدولية الخاصة بحقوق الإنسان ، والمنظمات الدولية العالمية والاقليمية القائمة على حماية تلك الحقوق ، وموقف الدستور المصرى من حقوق الانسان ، والحماية القانونية لها على الصعيد الوطنى والصعيد الدولى ، بالإضافة الى حقوق الانسان فى الشريعة الاسلامية – الاصول التاريخية الفلسفية لحقوق الانسان – المصادر الدولية لحقوق الانسان ( العالمية والاقليمية ) – المصادر الوطنية لحقوق الانسان – الاجهزة العالمية القائمة على حماية حقوق لأنسان ( أجهزة الامم المتحدة ) – الحماية الوطنية لحقوق الانسان – حقوق الانسان فى الشريعة الاسلامية – عرض لبعض طوائف الانسان – مراجعة عامة

### 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                            |                                                                                                   | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج) |                                                                                                                                                                                                                                                                    |
|------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على |                                                                                                   | (A3- A8- A10)                                                                                           |                                                                                                                                                                                                                                                                    |
| الكود                                          | النص                                                                                              | الكود                                                                                                   | النص                                                                                                                                                                                                                                                               |
| LO 1                                           | معرفة الحقوق الأساسية للإنسان والتي لا يحيا بدونها.                                               | A 3                                                                                                     | تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات النوعية مع مراعاة الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياسات التصميم والتنمية المستدامين. |
| LO 2                                           | معرفة ماله من حقوق وما عليه من واجبات.                                                            |                                                                                                         |                                                                                                                                                                                                                                                                    |
| LO 3                                           | معرفة دوره في بناء مجتمعه.                                                                        |                                                                                                         |                                                                                                                                                                                                                                                                    |
| LO 4                                           | المقارنة بين المراحل المختلفة لتطور حقوق الإنسان في الديانات السماوية والنظم الوضعية.             |                                                                                                         |                                                                                                                                                                                                                                                                    |
| LO 5                                           | معرفة حقوق المواطنة وحقوق الوطن على المواطن.                                                      | A 8                                                                                                     | التواصل بفعالية بانيات وشفاهة وكتابة، مع مجموعات من الجماهير باستخدام الأدوات العصرية.                                                                                                                                                                             |
| LO 6                                           | معرفة حقوق البيئة وضرورة الحفاظ عليها وعلاقتها بحقوق الإنسان.                                     |                                                                                                         |                                                                                                                                                                                                                                                                    |
| LO 7                                           | معرفة أنواع الفساد ودوره في إهدار حقوق الإنسان.                                                   |                                                                                                         |                                                                                                                                                                                                                                                                    |
| LO 8                                           | معرفة دور الشباب في مقاومة الفساد وطرق مقاومته.                                                   | A 10                                                                                                    | اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.                                                                                                                                                                              |
| LO 9                                           | الممارسة الصحيحة لما له من حقوق وما عليه من واجبات.                                               |                                                                                                         |                                                                                                                                                                                                                                                                    |
| LO10                                           | تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل في ضوء معرفته لمنظومة الحقوق والواجبات. |                                                                                                         |                                                                                                                                                                                                                                                                    |

### 4 طرق التعليم والتعلم للمقرر:

| التدريس المباشر |                           | التدريس الغير مباشر |                                      |                         |             |                          |                  |                  |                    |               |                  | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |                   |                             |
|-----------------|---------------------------|---------------------|--------------------------------------|-------------------------|-------------|--------------------------|------------------|------------------|--------------------|---------------|------------------|------------------------------------------------|--------------------|-------------------|-----------------------------|
| المحاضرات       | التمارين العملية والتجارب | العصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير / الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم بالإكتشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | التعلم الإلكتروني | النقاء الإصطناعي في التعليم |
| ✓               |                           | ✓                   |                                      | ✓                       | ✓           | ✓                        | ✓                |                  |                    | ✓             | ✓                |                                                |                    | ✓                 | ✓                           |

## الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي | المحتوى العلمي للمقرر<br>(موضوعات المقرر)                                                  | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |       |
|---------------------------|--------------------------------------------------------------------------------------------|------------------------------------|---------------------------|-------|
|                           |                                                                                            |                                    | تدريس<br>نظري             | تدريب |
|                           |                                                                                            |                                    |                           |       |
| عملية                     | تمارين                                                                                     |                                    |                           |       |
| 1                         | تقديم عن المقرر وتعريف أهميته في حياة الطالب.                                              | 1                                  | 1                         | 0     |
| 2                         | حقوق نفسك عليك، ما هي؟ وكيف تؤديها؟                                                        | 1                                  | 1                         | 0     |
| 3                         | - تعريف حقوق الإنسان وخصائصها.<br>- أنواع حقوق الإنسان.                                    | 1                                  | 1                         | 0     |
| 4                         | التطور التاريخي لحقوق الإنسان وحرياته.                                                     | 1                                  | 1                         | 0     |
| 5                         | - حقوق الإنسان في الشرائع السماوية.<br>- إهدار حقوق الإنسان في الولايات المتحدة الأمريكية. | 1                                  | 1                         | 0     |
| 6                         | حقوق الأبناء على الآباء.                                                                   | 1                                  | 1                         | 0     |
| 7                         | مراجعة وامتحان منتصف الفصل الدراسي                                                         |                                    |                           |       |
| 8                         | - حقوق الأزواج والزوجات وتأسيس أسرة صالحة.<br>- حقوق الآباء على الأبناء.                   | 1                                  | 1                         | 0     |
| 9                         | حقوق الوطن.                                                                                | 1                                  | 1                         | 0     |
| 10                        | - الانتماء للوطن.<br>- حقوق البيئة.                                                        | 1                                  | 1                         | 0     |
| 11                        | - حقوق اللغة العربية.<br>- الفساد وإهدار حقوق الإنسان. (1)                                 | 1                                  | 1                         | 0     |
| 12                        | - الفساد وإهدار حقوق الإنسان. (2)<br>- دور الشباب في مكافحة الفساد. (1)                    | 1                                  | 1                         | 0     |
| 13                        | دور الشباب في مكافحة الفساد. (2)                                                           | 1                                  | 1                         | 0     |
| 14                        | مراجعة عامة.                                                                               | 1                                  | 1                         | 0     |
| 16-15                     | اختبارات الفصل الدراسي النهائية                                                            |                                    |                           |       |

## 5- طرق تقييم الطلاب:

| م | طرق التقييم *                                 | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|-----------------------------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة)                   | 5                                                 | 10            | 10%                                     |
| 2 | امتحان 2 تحريري (أعمال سنة)                   | 9                                                 | 10            | 10%                                     |
| 3 | امتحان منتصف الفصل الدراسي                    | 7                                                 | 20            | 20%                                     |
| 4 | امتحان نهائي تحريري                           | 14                                                | 40            | 40%                                     |
| 5 | امتحان نهائي عملي                             | لا يوجد                                           | ----          | -----                                   |
| 6 | امتحان نهائي شفهي                             | 11                                                | 10            | 10%                                     |
| 7 | تكاليفات / مشروع / ملف الإنجاز / كتيب الأنشطة | 8                                                 | 10            | 10%                                     |

|   |              |         |       |
|---|--------------|---------|-------|
| 8 | تدريب ميداني | لا يوجد | ----- |
| 9 | أخرى (تذكر)  | لا يوجد | ----- |

## 6- مصادر التعلم والتسهيلات المادية:

|                                                                                                                                                                                                                                                                                                                                                                                                |                                                 |                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------|
| وليد رضوان، حقوق الإنسان، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان.                                                                                                                                                                                                                                                                                                                     | المرجع الأساسي للمقرر                           | مصادر التعلم<br>(الكتب والمراجع العلمية وغيرها)<br>* |
| 1- خديجة النبراوي: موسوعة حقوق الإنسان في الإسلام، دار السلام للطباعة والنشر والتوزيع، القاهرة. 2015<br>2- محمد الغزالي: حقوق الإنسان بين تعاليم الإسلام وإعلان الأمم المتحدة، القاهرة، دار الكتب الإسلامية، 1984<br>3- محمد عمارة: الإسلام وحقوق الإنسان، الكويت، سلسلة عالم المعرفة، عدد مايو 1985<br>4- محي شوقي أحمد: الجوانب الدستورية لحقوق الإنسان (رسالة دكتوراة، جامعة عين شمس، 1986) | المراجع الأخرى                                  |                                                      |
| 1- <a href="https://ar.wikipedia.org/wiki">https://ar.wikipedia.org/wiki</a><br>2- <a href="http://www.du.edu.eg/">http://www.du.edu.eg/</a><br>3- <a href="https://www.youtube.com/">https://www.youtube.com/</a>                                                                                                                                                                             | المصادر الإلكترونية<br>(لا بد من إضافة الروابط) |                                                      |
| <a href="https://www.ekb.eg/ar/home">https://www.ekb.eg/ar/home</a>                                                                                                                                                                                                                                                                                                                            | المنصة التعليمية<br>(لا بد من إضافة الرابط)     |                                                      |
| (داتا شو) وجهاز كمبيوتر محمول.                                                                                                                                                                                                                                                                                                                                                                 | الأجهزة                                         | التجهيزات التعليمية<br>المساندة للتعليم والتعلم *    |
| قاعة محاضرات مجهزة                                                                                                                                                                                                                                                                                                                                                                             | المستلزمات                                      |                                                      |
| -----                                                                                                                                                                                                                                                                                                                                                                                          | البرامج الإلكترونية                             |                                                      |
| -----                                                                                                                                                                                                                                                                                                                                                                                          | معامل المهارات/ المحاكيات                       |                                                      |
| -----                                                                                                                                                                                                                                                                                                                                                                                          | المعامل الافتراضية                              |                                                      |
| -----                                                                                                                                                                                                                                                                                                                                                                                          | أخرى (تذكر)                                     |                                                      |

| منسق المقرر       | منسق البرنامج        |         |
|-------------------|----------------------|---------|
| أ.م.د. وليد رضوان | أ.د/ أحمد عبد الغفار | الإسم   |
| وليد رضوان        | أحمد عبد الغفار      | التوقيع |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Railway Engineering</b>                |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 242</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                              |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Dynamics of Rolling, Track Alignment, Railway Branches. Design and Details of Track Parts. Stations and Yards. Signals, Maintenance, Renewing.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                | <b>Course Learning Outcomes</b>                                    |                                                                                                |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>A1, A4, B2</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                    | <b>Code</b>                                                        | <b>Text</b>                                                                                    |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.                                                                                                                                                                                                                               | <b>LO1</b>                                                         | Identify train dynamics by applying mathematics equations.                                     |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Solve acceleration and braking equations.                                                      |
| <b>A4</b>                                                                        | Utilize engineering technologies, codes of practice and standards, quality guidelines, health and safety requirements.                                                                                                                                                                                                                                         | <b>LO3</b>                                                         | Design topography of land to choose ideal way to construct geometric design.                   |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                | <b>LO4</b>                                                         | Construct the road according to standard guidelines to satisfy health and safety requirements. |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO5</b>                                                         | <b>Achieve optimum design of railway track</b>                                                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                | <b>LO6</b>                                                         | <b>sketch turnout and stations according to UIC code.</b>                                      |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |                |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|----------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | MICROSOFT TEAM | AI in Education |
| √                  | √                    |                      |                        |            |                       |                    |            |                |            |               |                    |                                          |              | √              |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                                                                                                                                                      | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                       |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                                                                                                       |                    |                                       | Tutorial | / Practical Lab |
| 1        | Introduction to Railway engineering + define clear tasks for the teaching assistant, including attending lectures, following up on students, and participating in practical explanations.             | 3                  | 2                                     | 1        | -               |
| 2        | Define forces, resistance, and relationship between them + Organize a weekly support session led by the teaching assistant to answer questions and help students understand the content and projects. | 3                  | 2                                     | 1        | -               |
| 3        | Calculate acceleration distance and time + Involving the teaching                                                                                                                                     | 3                  | 2                                     | 1        | -               |

|       |                                                                                                                                                                                                                     |   |   |   |   |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|       | assistant in evaluating student projects and providing constructive feedback to improve academic performance.                                                                                                       |   |   |   |   |
| 4     | Calculate braking distance and time                                                                                                                                                                                 | 3 | 2 | 1 | - |
| 5     | Introduction to alignment and design VI curve                                                                                                                                                                       | 3 | 2 | 1 | - |
| 6     | Introduction of HL curve                                                                                                                                                                                            | 3 | 2 | 1 | - |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                                        |   |   |   |   |
| 8     | Design Hl curve                                                                                                                                                                                                     | 3 | 2 | 1 | - |
| 9     | Introduction of track design, and                                                                                                                                                                                   | 3 | 2 | 1 | - |
| 10    | Design rail sleepers, and ballast + present lectures on modern rail transportation systems, including monorails, tunnels, and smart transportation, will be presented, along with videos and illustrative diagrams. | 3 | 2 | 1 | - |
| 11    | Turnouts + studying a case of a national project (such as the Administrative Capital Monorail or the Cairo Metro).                                                                                                  | 3 | 2 | 1 | - |
| 12    | Station + Design a proposed smart rail transportation system in an Egyptian city, followed by presentation and discussion of the projects in the lecture.                                                           | 3 | 2 | 1 | - |
| 13    | signals                                                                                                                                                                                                             | 3 | 2 | 1 | - |
| 14    | General review                                                                                                                                                                                                      | 3 | 2 | 1 | - |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                                  |   |   |   |   |

### **5- Methods of students' assessment:**



| No. | Assessment Methods * | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1               | 2                               | 10            | 10%                              |
| 2   | Quiz 2               | 3                               | 5             | 5%                               |
| 3   | Quiz 3               | 4                               | 5             | 5%                               |
| 4   | Quiz 4               | 5                               | 5             | 5%                               |
| 5   | Midterm exam         | 7                               | 20            | 20 %                             |
| 6   | Quiz 5               | 9                               | 10            | 10%                              |
| 7   | Quiz 6               | 10                              | 5             | 5%                               |
| 8   | Final Written Exam   | 15, 16                          | 40            | 40 %                             |

#### 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                      |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | Nathan Bush "Railway Engineering: Design, Construction and Operation" Willford Press (, 2020),                       |
|                                                                          | <b>Other References</b>                                                                                             | Nathan Bush "Railway Engineering: Design, Construction and Operation" Willford Press (March 8, 2022, isbn 1647283388 |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  |                                                                                                                      |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office<br><a href="#">General</a>   <a href="#">CIV 24201TO03</a>   <a href="#">Microsoft Teams</a>  |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          |                                                                                                                      |
|                                                                          | <b>Supplies</b>                                                                                                     |                                                                                                                      |
|                                                                          | <b>Electronic Programs</b>                                                                                          |                                                                                                                      |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       |                                                                                                                      |
|                                                                          | <b>Virtual Labs</b>                                                                                                 |                                                                                                                      |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      |                                                                                                                      |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | Dr. Amr Nada                                                                        | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Foundation Engineering (1)</b>         |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 243</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed Nabil                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Soil Compaction: Laboratory and Field Methods, stability of slopes, Seepage through soil, Dewatering, Introduction to Foundation Engineering: Shallow Foundations, Bearing Capacity, and Settlement Analysis.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                      |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>A2, A4, B1, B2</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                      |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                          |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions                                                                                                                                                                                            | <b>LO1</b>                                                         | Identify the shear strength of soil to solve engineering problems related to it by applying engineering fundamentals |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Conduct direct shear test triaxial shear test, and unconfined compression test.                                      |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles                                                                                                                                                                                                                                 | <b>LO3</b>                                                         | Employ the Egyptian code in calculating the soil Bearing capacity                                                    |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO4</b>                                                         | Calculate the factor of safety of slopes.                                                                            |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO5</b>                                                         | Utilize the Egyptian code in shallow foundation design.                                                              |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO6</b>                                                         | Select appropriate shear strength test according to soil type.                                                       |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.                                              | <b>LO7</b>                                                         | Calculate the safety requirement of shallow foundation and retaining wall according to Egyptian code.                |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      |            | √                     |                    |            |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                                                                                                                                                                  | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                                   |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                                                                                                                   |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to physical meaning of shear strength of cohesionless and cohesive soils + Hold a preliminary meeting with the teaching assistant to determine the academic tasks required of him during the course. | 3                  | 2                                     | 1        | --              |
| 2        | Determination of shear parameters in laboratory and field + Involve the teaching assistant in explaining a practical part of the lecture or leading a small discussion group.                                     | 3                  | 2                                     | 1        | --              |

|    |                                                                                                                                                                                                                                           |   |   |   |    |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| 3  | Laboratory visit to recognize the available apparatuses to determine the shear strength parameters + Assigning the teaching assistant to follow up on a student project or activity and submitting a report on the students' performance. | 3 | 2 | 1 | -- |
| 4  | Introduction to bearing capacity of soils, methods of determination the bearing capacity of soil                                                                                                                                          | 3 | 2 | 1 | -- |
| 5  | Introduction to Stability of Slopes<br>a-Types of slope failure.                                                                                                                                                                          | 3 | 2 | 1 | -- |
| 6  | Determination the factor of safety of slopes in c- $\phi$ soils.                                                                                                                                                                          | 3 | 2 | 1 | -- |
| 7  | <b>Revision and Mid Exam</b>                                                                                                                                                                                                              |   |   |   |    |
| 8  | Introduction: Types of foundations, factors governing the choice of foundation type, general principles of foundation design.                                                                                                             | 3 | 2 | 1 | -- |
| 9  | Complete Design of strip footings., square and rectangular footing                                                                                                                                                                        | 3 | 2 | 1 | -- |
| 10 | Design of eccentric isolated footings + Providing a theoretical lecture on the types of borholes, site exploration methods, and their impact on foundation design.                                                                        | 3 | 2 | 1 | -- |
| 11 | Design of combined footings + Practical workshop using SAFE software to design shallow foundations with a practical model.                                                                                                                | 3 | 2 | 1 | -- |
| 12 | Design of strap beam footing + Students are assigned a mini-project to design a shallow foundation using SAFE based on virtual geotechnical data, with presentation and discussion of the results.                                        | 3 | 2 | 1 | -- |
| 13 | Raft foundation: types and design methods                                                                                                                                                                                                 | 3 | 2 | 1 | -- |

|       |                                                                                                                               |   |   |   |    |
|-------|-------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| 14    | Introduction: Types of foundations, factors governing the choice of foundation type, general principles of foundation design. | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                            |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 6                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 10                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project          | weekly                          | 20            | 20 %                             |

**6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Braja M. Das (2019), Shallow Foundations: Bearing Capacity and Settlement, Second Edition, ISBN, 978-0367385958</li> <li>Bowels, J.E. (1988): Foundation Analysis and DESIGN, Mcgraw. Hill Inc, New York.</li> <li>Egyptian Code.</li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Abd El-Rahman Hindi. "Foundation Design" (2020)</li> </ul>                                                                                                                                                                                   |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="http://www.geotechnical.net">www.geotechnical.net</a></li> </ul>                                                                                                                                                                    |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                              |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                              |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Electronic Programs</b>                                                                                          | <b>Auto cade</b>                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                  |

|  |                           |                            |
|--|---------------------------|----------------------------|
|  | <b>Course Coordinator</b> | <b>Program Coordinator</b> |
|--|---------------------------|----------------------------|

| Name      | Dr. Ahmed Nabil                                                                   | Dr. Ghada Nashaat Mohamed                                                          |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Signature |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Reinforced Concrete (3)</b>            |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 244</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Rectangular and circular tanks and fluids containers, Underground, on the ground and elevated tanks. Design and working drawings of beams, frames, arches, trusses and saw tooth roofs.



### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                              |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A4, A10, B1, B2</b>                                                   |                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                              |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                  |
| <b>A2</b>                                                                        | <b>Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.</b>                                                                                                    | <b>LO1</b>                                                         | <b>Identify the concrete properties of flexure, and shear members to solve engineeringbased design problems by applying design formulas.</b> |
|                                                                                  |                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | <b>Conduct design parameters of flexure, shear, and normal members.</b>                                                                      |
|                                                                                  |                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | <b>Employ the Egyptian code in design of flexure, shear and normal members.</b>                                                              |
| <b>A3</b>                                                                        | <b>Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.</b> | <b>LO4</b>                                                         | <b>List the design methodologies for design of eccentric sections.</b>                                                                       |
|                                                                                  |                                                                                                                                                                                                                                                                                                                             | <b>LO5</b>                                                         | <b>Describe the different types of tanks.</b>                                                                                                |
| <b>A4</b>                                                                        | <b>Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.</b>                                                                                                                                        | <b>LO6</b>                                                         | <b>Apply design process of reinforced concrete arch and frame system to produce costeffective design.</b>                                    |
| <b>A10</b>                                                                       | <b>Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.</b>                                                                                                                                                                                                                          | <b>LO7</b>                                                         | <b>Utilize code practices and standard to design appropriate specials tanks, frame and arch.</b>                                             |
| <b>B1</b>                                                                        | <b>Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range</b>                                                                                              | <b>LO8</b>                                                         | <b>Calculate the axial loads acting on tie.</b>                                                                                              |
|                                                                                  |                                                                                                                                                                                                                                                                                                                             | <b>LO9</b>                                                         | <b>Utilize the Egyptian code in design and construction of reinforced concrete structures.</b>                                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                             | <b>LO10</b>                                                        | <b>Select appropriate structure system.</b>                                                                                                  |

|    |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                                                       |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------|
|    | of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                                                                                                 |      |                                                                                       |
| B2 | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the other emerging field relevant to the discipline. | LO11 | Achieve optimum design of special hole-system and flexure, tension members.           |
|    |                                                                                                                                                                                                                                                                                                                                                                                                     | LO12 | Analyze the shear and torsion strength of concrete and safe design of girder element. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                                                                                                                          | Total Weekly Hours | Expected number of the Learning Hours |          |                |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|----------------|
|          |                                                                                                                                                                                                                                                                                                              |                    | Theoretical teaching<br>(lectures)    | Training |                |
|          |                                                                                                                                                                                                                                                                                                              |                    |                                       | Tutorial | Practical /Lab |
| 1        | Design of reinforced concrete tanks, introduction, types of tanks, definition of waterside sections.                                                                                                                                                                                                         | 4                  | 2                                     | 2        | ---            |
| 2        | Design of water side sections subjected to axial tension, bending moment, and both in stages I and II, rules for choosing reinforcement.<br>Explaining the steps of manual design for concrete elements and demonstrating how to input the same elements in SAP2000, followed by a comparison of the results | 4                  | 2                                     | 2        | ---            |
| 3        | Design of rectangular shallow walls in elevated tanks, design of rectangular deep walls in elevated tanks.                                                                                                                                                                                                   | 4                  | 2                                     | 2        | ---            |
| 4        | Design of rectangular medium walls in elevated tanks in horizontal and vertical directions.<br>Execution and review of a mini-project that integrates manual design with modeling in SAP2000.                                                                                                                | 4                  | 2                                     | 2        | ---            |
| 5        | Design of cylindrical walls in circular elevated tanks.                                                                                                                                                                                                                                                      | 4                  | 2                                     | 2        | ---            |
| 6        | Design of ground tanks and underground tanks.                                                                                                                                                                                                                                                                | 4                  | 2                                     | 2        | ---            |
| 7        | <b>Revision and Mid Exam</b>                                                                                                                                                                                                                                                                                 |                    |                                       |          |                |
| 8        | Design of halls, introduction, wide span structures, different statical systems, general layout, design of girders.                                                                                                                                                                                          | 4                  | 2                                     | 2        | ---            |
| 9        | Design of reinforced concrete frames.                                                                                                                                                                                                                                                                        | 4                  | 2                                     | 2        | ---            |
| 10       | Design of arch girder with a tie.                                                                                                                                                                                                                                                                            | 4                  | 2                                     | 2        | ---            |
| 11       | Design of arched slab roofs.                                                                                                                                                                                                                                                                                 | 4                  | 2                                     | 2        | ---            |
| 12       | Design of north light systems, north direction is parallel to span, north direction is perpendicular to span, design of different supporting elements.                                                                                                                                                       | 4                  | 2                                     | 2        | ---            |
| 13       | Design of sections subjected to axial compression and uniaxial bending.                                                                                                                                                                                                                                      | 4                  | 2                                     | 2        | ---            |

|       |                                     |   |   |   |     |
|-------|-------------------------------------|---|---|---|-----|
| 14    | Revision + Quiz + details of frames | 4 | 2 | 2 | --- |
| 15,16 | <b>Final Exam.</b>                  |   |   |   |     |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *                 | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) Quiz1 | <b>6</b>                        | <b>7.5</b>    | <b>7.5%</b>                      |
| 2   | Exam 2 written (Semester work) Quiz2 | <b>8</b>                        | <b>7.5</b>    | <b>7.5%</b>                      |
| 3   | Presentation                         | <b>11</b>                       | <b>10</b>     | <b>10%</b>                       |
| 3   | Midterm exam                         | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 4   | Final Written Exam                   | <b>15</b>                       | <b>40</b>     | <b>40 %</b>                      |
| 7   | Assignments / Project / Logbook      | <b>6,11</b>                     | <b>15</b>     | <b>15%</b>                       |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• DESIGN OF CONCRETE STRUCTURES DAVID DARWIN 2016</li> <li>• Design of reinforced concrete structures: Dr. M. Goneem 2019</li> <li>• Reinforced Concrete: Park and Puly</li> <li>• Design and construction of reinforced concrete structures ECP-203-2018</li> <li>• Loads applied on building ECP-208</li> </ul>                                                                                                                    |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>• ASCE: American society of civil Engineering.</li> <li>• BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                                                                |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>• <a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhoura-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhoura-ghoneim.html</a></li> <li>• <a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li>• <a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |

|                                                                          |                                                    |                                                                 |
|--------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> |                                                    |                                                                 |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                          |
|                                                                          | <b>Devices/Instruments</b>                         | Data Show, White Board                                          |
|                                                                          | <b>Supplies</b>                                    | --                                                              |
|                                                                          | <b>Electronic Programs</b>                         | <b>AutoCAD program</b><br><b>CSI programs (SAP), PowerPoint</b> |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                              |
|                                                                          | <b>Virtual Labs</b>                                | --                                                              |
|                                                                          | <b>Other (to be mentioned)</b>                     | --                                                              |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Prof. Essam Khalifa</b>                                                        | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                              |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Structural Analysis and Mechanics (5)</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 245</b>                               |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                            |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                           | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                            | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                   |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                              |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                            |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>        |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | <b>Ass. Prof. Morcos Farid Samaan</b>        |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department    |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                           |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Matrix Stiffness Analysis, element and structural stiffness assembly, development of computer programs for linear elastic structural analysis.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                             |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A8, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                             |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                                 |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Identify the principals to solve statically indeterminate structures using the stiffness method associated with superposition and free body diagram concepts.                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Developing of stiffness matrices for members as well as for the entire structures.                                                                                                          |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | Evaluate the deflection results according to input data and engineering sense.                                                                                                              |
| <b>A8</b>                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                                                                                                                                                                                                                                                                                        | <b>LO4</b>                                                         | Discuss the mini-project output in front of the judging committee established from the course teachers and other students.                                                                  |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Select the suitable solving technique whether manual or using computer to solve structure based on available degrees of freedoms and evaluate the final results based on engineering sense. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            | √                     | √                  |            |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                      | Total Weekly Hours | Expected number of the Learning Hours |          |                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|----------------|
|          |                                                                                                                                                                                                          |                    | Theoretical teaching (lectures)       | Training |                |
|          |                                                                                                                                                                                                          |                    |                                       | Tutorial | Practical /Lab |
| 1        | Stability and determinacy of structures.                                                                                                                                                                 | 3                  | 2                                     | 1        | ----           |
| 2        | Introduction to Direct stiffness matrix method.                                                                                                                                                          | 3                  | 2                                     | 1        | ----           |
| 3        | Direct Stiffness method for Rod element + Assign students an individual or group application project to apply FEM to a more complex structural element, with presentation and discussion of the results. | 3                  | 2                                     | 1        | ----           |
| 4        | Direct Stiffness method for Rod – Diphram.                                                                                                                                                               | 3                  | 2                                     | 1        | ----           |
| 5        | Matrix Stiffness method for plane trusses.                                                                                                                                                               | 3                  | 2                                     | 1        | ----           |
| 6        | Direct Stiffness method for plane trusses with inclined members.                                                                                                                                         | 3                  | 2                                     | 1        | ----           |
| 7        | Revision and Mid Exam                                                                                                                                                                                    |                    |                                       |          |                |



|       |                                                                                                                                                                                        |   |   |   |      |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|------|
| 8     | Determination of stiffness matrix by assumed displacements.                                                                                                                            | 3 | 2 | 1 | ---- |
| 9     | Direct Stiffness method for plane beams.                                                                                                                                               | 3 | 2 | 1 | ---- |
| 10    | Direct Stiffness method for plane beams with inclined members + Provide an introductory lecture on implementing the Finite Element Method using MATLAB, explaining the basic concepts. | 3 | 2 | 1 | ---- |
| 11    | Direct Stiffness method for plane frame + Practical workshop on applying FEM to a simple model using MATLAB code.                                                                      | 3 | 2 | 1 | ---- |
| 12    | Matrix Stiffness method for plane frames with inclined members.                                                                                                                        | 3 | 2 | 1 | ---- |
| 13    | Matrix Stiffness method for Solution combined structure .                                                                                                                              | 3 | 2 | 1 | ---- |
| 14    | Introduction to finite element method.                                                                                                                                                 | 3 | 2 | 1 | ---- |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                     |   |   |   |      |

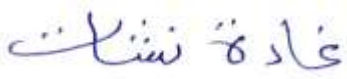
### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 3                               | 10            | 10 %                             |
| 2   | Quiz 2 written (Semester work) | 10                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments                    | weekly                          | 20            | 20 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                        |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>STRUCTURAL ANALYSIS, ASLAM KASSIMALI, CRC PRESS, 12289, N.YORK, 2020</li> </ul> |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          | <b>Other References</b>                            | <ul style="list-style-type: none"> <li>Matrix Structural Analysis, 2nd Edition, <b>William McGuire, Richard H. Gallagher, Ronald D. Ziemian</b>, (2000).</li> </ul>                                                                           |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li><a href="http://www.experiencefestival.com/structural_analysis_-_mechanics_of_materials_methods">http://www.experiencefestival.com/structural_analysis_-_mechanics_of_materials_methods</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Supplies</b>                                    | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                            |
|                                                                          | <b>Other</b> (to be mentioned)                     | --                                                                                                                                                                                                                                            |

|                  |                                                                                     |                                                                                       |
|------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                            |
| <b>Name</b>      | <b>Ass. Prof. Morcos Farid Samaan</b>                                               | <b>Dr. Ghada Nashaat Mohamed</b>                                                      |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Construction Project Management</b>    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 241</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 1                                         | 1                |                        | 2            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Asmaa Ahmed Soliman                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Introduction to the legal and contractual aspects of the construction industry. Techniques for coordinating decisions and actions in the design and construction of engineering projects. Bidding strategies and procedures. Different types of Specifications. Contract documents. Quantity surveying principals – Claims – Disputes – Contract types.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                            | Course Learning Outcomes                                    |                                                                                     |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|
| A2, B1, B2, B3                                                            |                                                                                                                                                                                                                                                                                                                                                                                                            | Upon completion of the course, the student will be able to: |                                                                                     |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                       | Code                                                        | Text                                                                                |
| <b>A2</b>                                                                 | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw Conclusions.                                                                                                                                                                                          | <b>LO1</b>                                                  | Analysis of the project life cycle for the construction project.                    |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO2</b>                                                  | Predict if the project will achieve success or not (such as time – cost technique). |
| <b>B1</b>                                                                 | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics | <b>LO3</b>                                                  | Computing activities duration depends on the units or total quantity required       |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO4</b>                                                  | Determine the Relation between tasks.                                               |
| <b>B2</b>                                                                 | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.                                             | <b>LO5</b>                                                  | Illustrate the Different types of Specifications.                                   |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                            | <b>LO6</b>                                                  | Controlling the situation of the project                                            |
| <b>B3</b>                                                                 | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.                                                                                                                                                                                                | <b>LO7</b>                                                  | Plan construction of engineering projects documentation.                            |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | -                    | ✓                      | -          | -                     | -                  | -          | -              | -          | -             | -                  | -                                        | -            | -          | -               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                       | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                           |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                           |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction for project management, Work Breakdown Structure (WBS), Organization Breakdown Structure (OBS), Activity & Scope,                                                            | 2                  | 1                                     | 1        | 0               |
| 2        | Planning Process and Time management (Project Planning)<br>Principles and practices of critical path methodology under conditions of certainty (CPM) and conditions of (uncertainty (PERT | 2                  | 1                                     | 1        | 0               |
| 3        | Study the Project Networks such as (AOA, and AON) with solved Examples                                                                                                                    | 2                  | 1                                     | 1        | 0               |
| 4        | Project Constraints and Solved Examples                                                                                                                                                   | 2                  | 1                                     | 1        | 0               |
| 5        | Time-cost trade-off concepts with and without resource limitations.                                                                                                                       | 2                  | 1                                     | 1        | 0               |

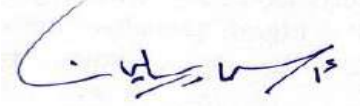
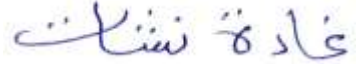
|       |                                                                     |   |   |   |   |
|-------|---------------------------------------------------------------------|---|---|---|---|
| 6     | Time-cost trade-off concepts with and without resource limitations. | 2 | 1 | 1 | 0 |
| 7     | <b>Revision and Mid Exam</b>                                        |   |   |   |   |
| 8     | Resource Management                                                 | 2 | 1 | 1 | 0 |
| 9     | Cash flow analysis and financial analysis.                          | 2 | 1 | 1 | 0 |
| 10    | Cash flow analysis and financial analysis.                          | 2 | 1 | 1 | 0 |
| 11    | Cash flow analysis and financial analysis.                          | 2 | 1 | 1 | 0 |
| 12    | Line of balance Technique with solved Examples                      | 2 | 1 | 1 | 0 |
| 13    | Cost Control and Value Engineering Technique                        | 2 | 1 | 1 | 0 |
| 14    | Revision                                                            | 2 | 1 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                                                  |   |   |   |   |

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            | 2                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work)            | 6                               | 10            | 10 %                             |
| 3   | Exam 3 written (Semester work)            | 12                              | 10            | 10 %                             |
| 4   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 5   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 6   | Assignments / Project /Portfolio/ Logbook | 10                              | 10            | 10 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                  |                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b> (must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Construction Project Management Theory And Practice, Larry Mckenzie, Kaufman Press Library, 12355, U.S.A, 2024.</li> <li>Civil Engineering: Building Materials Properties, Cayson Carter, Murphy &amp; Moore Library, 12375, New York, 2023.</li> </ul> |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                          | <ul style="list-style-type: none"> <li>• Project Management Techniques In Planning; H. N. Ahuja, 1994, Publisher John Wiley &amp; Sons Inc, Isbn (0471591688).</li> <li>• Project Management For Engineering, Garold D. Obirlender, Butterworth Library, 8449, N.York, 1995.</li> </ul>                                                                                                                                                                                                                                                                                                             |
|  | <b>Other References</b>                                                  | <ul style="list-style-type: none"> <li>• Introduction to Construction Management; Fred Sherratt, 2015, Routledge Publishing ,ISBN (9781032007441)</li> <li>• Handbook of Construction Management: Scope, Schedule, and Cost Control; Abdul Razzak Ruman; 2016, Publisher CRC Press, ISBN (1482226642)</li> <li>• Construction Management: Theory and Practice; Chris March; 2017, Routledge Publishing ,ISBN (9781138694477)</li> <li>• International Construction Management: How the Global Industry Reshapes the World; Igor Martek; 2022. Routledge Publishing ,ISBN (9780367563622)</li> </ul> |
|  | <b>Electronic Sources</b><br>(Links must be added)                       | <ul style="list-style-type: none"> <li>• <u><a href="https://www.cmaanet.org/">Construction Management Association of America;</a></u> (1982-now)</li> <li>• <u><a href="https://www.pmi.org/">Project Management Institute;</a></u> (1969- now)</li> </ul>                                                                                                                                                                                                                                                                                                                                         |
|  | <b>Learning Platforms</b><br>(Links must be added)                       | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  | <b>Supportive facilities &amp; equipment for teaching and learning *</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  | <b>Devices/Instruments</b>                                               | Projector- White board- Personal Computer- Microsoft Team                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|  | <b>Supplies</b>                                                          | Lecture notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|  | <b>Electronic Programs</b>                                               | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  | <b>Skill Labs/ Simulators</b>                                            | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  | <b>Virtual Labs</b>                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  | <b>Other (to be mentioned)</b>                                           | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|           | Course Coordinator                                                                | Program Coordinator                                                                |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Name      | Dr. Asmaa Ahmed Soliman                                                           | Dr. Ghada Nashaat Mohamed                                                          |
| Signature |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                                  |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Civil Engineering Project (B.SC. Project)</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 246</b>                                   |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                               | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                       |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                  |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>            |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                          |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department        |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                               |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

An independent research and/or design project to be carried out under the supervision of a staff member, running over two semesters in the fifth year. The results must be submitted in the form of a thesis, judged and marked by a jury of at least two staff members.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | Course Learning Outcomes                                       |                                                                                                                                        |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| A3, A4, A5, A6, A7, A8, A9, A10,<br>B1, B2, B3 and B4                     |                                                                                                                                                                                                                                                                                                                     | Upon completion of the course, the<br>student will be able to: |                                                                                                                                        |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                | Code                                                           | Text                                                                                                                                   |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | LO1                                                            | Apply engineering design processes in the Context of the civil engineering project.                                                    |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | LO2                                                            | Utilize codes of practice, standards, quality guidelines, health, and safety requirements in the context of civil Engineering project. |
| A5                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                                                                                                                                                          | LO3                                                            | Practice research and methods of investigation on collecting scientific data on a particular problem.                                  |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                            | LO4                                                            | Plan, supervise and monitor the implementation of the project.                                                                         |
| A7                                                                        | Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.                                                                                                                                                                                                               | LO5                                                            | Function efficiently in an individual tasks and as a part of the multi-disciplinary teams.                                             |
| A8                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                                                                                                                                                                                                | LO6                                                            | Communicate effectively using contemporary tools (graphs, writing, verbal).                                                            |
| A9                                                                        | Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                       | LO7                                                            | Use creative thinking to respond to new situation during problem solving.                                                              |
| A10                                                                       | Acquire and apply new technology; and practice self; lifelong; and other learning strategies                                                                                                                                                                                                                        | LO8                                                            | Acquire leadership skills to anticipate in problem solving.                                                                            |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO9                                                            | Apply new knowledge and learning strategies during the project.                                                                        |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements                                                                                                                                     | LO10                                                           | Select appropriate and sustainable techniques for all civil engineering branches.                                                      |

|           |                                                                                                                                                                                                                                                                                                                                                                |             |                                                                |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------|
|           | and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                    |             |                                                                |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO11</b> | Achieve an optimum design of all civil engineering fields.     |
| <b>B3</b> | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.                                                                                                                                                    | <b>LO12</b> | Plan and manage construction processes.                        |
|           |                                                                                                                                                                                                                                                                                                                                                                | <b>LO13</b> | Address construction defects, instability, and quality issues. |
|           |                                                                                                                                                                                                                                                                                                                                                                | <b>LO14</b> | Maintain safety measures.                                      |
|           |                                                                                                                                                                                                                                                                                                                                                                | <b>LO15</b> | Assess environmental impact of the project.                    |
| <b>B4</b> | Deal with biddings, contracts and financial issues including project insurance and guarantees.                                                                                                                                                                                                                                                                 | <b>LO16</b> | Deal with financial issue.                                     |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brainstorming        | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      | √          | √                     | √                  | √          |                |            | √             | √                  | √                                        | -            | √          | √               |

**Course Schedule:**

| Week No.                         | Scientific content of the course<br>(Course Topics)     | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------------------------------|---------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|                                  |                                                         |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|                                  |                                                         |                    |                                       | Tutorial | Practical / Lab |
| Topics actually taught<br>Term 1 |                                                         |                    |                                       |          |                 |
| 1                                | Discussion of project idea-collecting data              | 30                 | 20                                    | 10       | 0               |
| 2                                |                                                         |                    |                                       |          |                 |
| 3                                | Discussion of project idea-collecting data              |                    |                                       |          |                 |
| 4                                |                                                         |                    |                                       |          |                 |
| 5                                | Analysis of collected data to determine project concept |                    |                                       |          |                 |
| 6                                |                                                         |                    |                                       |          |                 |
| 7                                |                                                         |                    |                                       |          |                 |
| 8                                |                                                         |                    |                                       |          |                 |
| 9                                | Design for experimental work - simulation program       |                    |                                       |          |                 |
| 10                               |                                                         |                    |                                       |          |                 |
| 11                               |                                                         |                    |                                       |          |                 |
| 12                               | Preparation of materials, resources                     |                    |                                       |          |                 |
| 13                               |                                                         |                    |                                       |          |                 |

| <i>Week No.</i>                  | <i>Scientific content of the course<br/>(Course Topics)</i> | <i>Total Weekly Hours</i> | Expected number of the Learning Hours |          |                 |
|----------------------------------|-------------------------------------------------------------|---------------------------|---------------------------------------|----------|-----------------|
|                                  |                                                             |                           | Theoretical teaching<br>(lectures)    | Training |                 |
|                                  |                                                             |                           |                                       | Tutorial | Practical / Lab |
| Topics actually taught<br>Term 2 |                                                             |                           |                                       |          |                 |

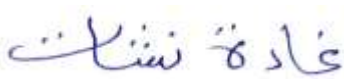
|    |                                                                     |    |    |    |   |
|----|---------------------------------------------------------------------|----|----|----|---|
| 1  | Experimental work, design of all elements..etc                      | 30 | 20 | 10 | 0 |
| 2  |                                                                     |    |    |    |   |
| 3  |                                                                     |    |    |    |   |
| 4  |                                                                     |    |    |    |   |
| 5  |                                                                     |    |    |    |   |
| 6  |                                                                     |    |    |    |   |
| 7  |                                                                     |    |    |    |   |
| 8  |                                                                     |    |    |    |   |
| 9  | Review all work and conclusion                                      |    |    |    |   |
| 10 |                                                                     |    |    |    |   |
| 11 |                                                                     |    |    |    |   |
| 12 | Prepare seminar, presentation, calculation notes and project thesis |    |    |    |   |
| 13 |                                                                     |    |    |    |   |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                          | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-----------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Final Exam (presentation + calculation sheet) | 15, 16                          | 40            | 40 %                             |
| 2   | Midterm exam (Term work)                      | Term 2 – 3 <sup>rd</sup> week   | 20            | 20 %                             |
| 3   | Attendance                                    |                                 | 20            | 20 %                             |
| 4   | Technical Report                              |                                 | 20            | 20 %                             |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                      |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Up to supervisors.</li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Up to supervisors.</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                   |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                               |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Lab Facilities                                                       |
|                                                                          | <b>Supplies</b>                                                                                                     | Data show - White board - MS Team                                    |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                   |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                   |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                   |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                   |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Airport Engineering</b>                |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 321</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                              |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Design, evolution and operation of airports. The viewpoints taken in the course will allow undergraduates to play a significant role in those air-transportation development fields in the future, where airport requirements are a significant issue.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><br><b>A3, A4, B2</b> |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b> |                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Code</b>                                                                                               | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                     | <b>Text</b>                                                                                                                                               |
| <b>A3</b>                                                                                                 | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO1</b>                      | Design of landing area and airport pavements.                                                                                                             |
| <b>A4</b>                                                                                                 | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | <b>LO2</b>                      | Specialized knowledge in particular areas and/or aspects of airport planning and/or management and an appreciation of the implications for best practice. |
| <b>B2</b>                                                                                                 | Achieve an optimum design of pavement and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.   | <b>LO3</b>                      | Achieve the travel demand forecasting process.                                                                                                            |



#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                            | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                |                    |                                       | Tutorial | Practical / Lab |
| 1        | Course introduction, history of airport engineering, air craft characteristics | 3                  | 2                                     | 1        | --              |
| 2        | Air craft characteristics, air craft technology                                | 3                  | 2                                     | 1        | --              |
| 3        | Air traffic control systems                                                    | 3                  | 2                                     | 1        | --              |
| 4        | Problem definition and identification of goals and objectives                  | 3                  | 2                                     | 1        | --              |
| 5        | Airport capacity, air port configuration                                       | 3                  | 2                                     | 1        | --              |
| 6        | Air port master planning, forecasting in airport planning                      | 3                  | 2                                     | 1        | --              |
| 7        | Revision and Mid Exam                                                          |                    |                                       |          |                 |

|       |                                    |   |   |   |    |
|-------|------------------------------------|---|---|---|----|
| 8     | Design of the landing area         | 3 | 2 | 1 | -- |
| 9     | Airport terminals                  | 3 | 2 | 1 | -- |
| 10    | Design of airport pavements        | 3 | 2 | 1 | -- |
| 11    | Lightening and marking of airport. | 3 | 2 | 1 | -- |
| 12    | Case studies and applications      | 3 | 2 | 1 | -- |
| 13    | Air cargo terminals                | 3 | 2 | 1 | -- |
| 14    | Course critique and review         | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                 |   |   |   |    |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 5                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 10                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Tutorial and report assessment | 6 & 14                          | 20            | 20 %                             |

#### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                              |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Geotechnics of Roads :Fundamentals, Bernardo Caice, CRC PRESS, 12159 &amp; 12290, LONDON, 2019.</li> </ul>                                            |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>هندسة الطرق والمطارات د. سامي غازي</li> <li>Garber, N. and Hoel, L. (2001) Traffic and highway Engineering. NewYork</li> <li>Lecture notes</li> </ul> |

|                                                                          |                                                    |                        |
|--------------------------------------------------------------------------|----------------------------------------------------|------------------------|
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | --                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board |
|                                                                          | <b>Supplies</b>                                    | MS Team                |
|                                                                          | <b>Electronic Programs</b>                         | --                     |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                     |
|                                                                          | <b>Virtual Labs</b>                                | --                     |
|                                                                          | <b>Other</b> (to be mentioned)                     | --                     |

|                  |                                |                                  |
|------------------|--------------------------------|----------------------------------|
|                  | <b>Course Coordinator</b>      | <b>Program Coordinator</b>       |
| <b>Name</b>      | <b>Dr. Amr Abd Elaziz Nada</b> | <b>Dr. Ghada Nashaat Mohamed</b> |
| <b>Signature</b> | د/ عمرو عبدالعزيز ندا          | غادة نشأت                        |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Traffic Engineering</b>                |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 323</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr nada                              |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Introduction to traffic engineering this includes Components of traffic system, Traffic studies, Traffic flow theory, Capacity of urban roads, Capacity of Intersections, Introduction to queuing theory, Traffic signals (signs and marking), Parking, Pedestrians, Traffic safety.

### **3. Course Learning Outcomes CLOs :**

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                              | Course Learning Outcomes                                    |                                                                                     |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>A4, A6, B2</b>                                                         |                                                                                                                                                                              | Upon completion of the course, the student will be able to: |                                                                                     |
| Code                                                                      | Text                                                                                                                                                                         | Code                                                        | Text                                                                                |
| <b>A4</b>                                                                 | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles. | <b>LO1</b>                                                  | Utilize technologies, codes of standards Capacity of urban roads and intersections. |
|                                                                           |                                                                                                                                                                              | <b>LO2</b>                                                  | design of parking                                                                   |
| <b>A6</b>                                                                 | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                     | <b>LO3</b>                                                  | PLAN transportation project alternatives.                                           |
| <b>B2</b>                                                                 | Achieve an optimum design of following civil engineering topics: Transportation and Traffic, Roadways and Airports.                                                          | <b>LO4</b>                                                  | Achieve an optimum design of Traffic signals                                        |
|                                                                           |                                                                                                                                                                              | <b>LO5</b>                                                  | Study accidents and road safety                                                     |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)     | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|---------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                         |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                         |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to the principles of traffic engineering   | 3                  | 2                                     | 1        | ...             |
| 2        | Components of traffic system                            | 3                  | 2                                     | 1        | ...             |
| 3        | Traffic studies                                         | 3                  | 2                                     | 1        | ...             |
| 4        | Traffic flow theory                                     | 3                  | 2                                     | 1        | ...             |
| 5        | Capacity of urban roads,                                | 3                  | 2                                     | 1        | ...             |
| 6        | Capacity of Intersections                               | 3                  | 2                                     | 1        | ...             |
| 7        | Revision and Mid Exam                                   |                    |                                       |          |                 |
| 8        | Introduction to queuing theory                          | 3                  | 2                                     | 1        | ...             |
| 9        | Parking surveys and design principles of parking spaces | 3                  | 2                                     | 1        | ...             |

|       |                                  |   |   |   |     |
|-------|----------------------------------|---|---|---|-----|
| 10    | Traffic signals                  | 3 | 2 | 1 | ... |
| 11    | types of signals                 | 3 | 2 | 1 | ... |
| 12    | Accidents and road safety        | 3 | 2 | 1 | ... |
| 13    | Accidents and road safety conti. | 3 | 2 | 1 | ... |
| 14    | review                           | 3 | 2 | 1 | ... |
| 15,16 | <b>Final Exam.</b>               |   |   |   |     |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | <b>5</b>                        | <b>10</b>     | <b>10 %</b>                      |
| 2   | Exam 2 written (Semester work) | <b>10</b>                       | <b>10</b>     | <b>10 %</b>                      |
| 3   | Midterm exam                   | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 4   | Final Written Exam             | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 5   | Tutorial and report assessment | <b>6 &amp; 14</b>               | <b>20</b>     | <b>20 %</b>                      |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>TRANSPORTATION ENGINEERING BEVERLY T.KUHN, 12309, (2019)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Highway Traffic Analysis and Design", Salter, R. J., The Macmillan Press, Ltd., 1992</li> <li>text books (Highway Engineering Volume 1 and Volume 2, Gerber)</li> <li>Geometric design of Highways, Staff of Highway and Traffic Engineering, Cairo University</li> <li>Structural Design of highways, Staff of Highway and Traffic Engineering, Cairo University</li> <li>Traffic Engineering Handbook“,McShane, Willium R., Roess, Roger P., Prentice-Hall, Inc., Englewood Cliffs, New Gersey, USA,1990.</li> </ul> |

|                                                                          |                                                    |                                                                                                                   |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <ul style="list-style-type: none"> <li>Highway Capacity Manual", Transportation Research Board, , 2000</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | --                                                                                                                |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board                                                                                            |
|                                                                          | <b>Supplies</b>                                    | MS Team                                                                                                           |
|                                                                          | <b>Electronic Programs</b>                         | -----                                                                                                             |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | -----                                                                                                             |
|                                                                          | <b>Virtual Labs</b>                                | -----                                                                                                             |
|                                                                          | <b>Other</b> (to be mentioned)                     | -----                                                                                                             |

|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b>       |
|------------------|---------------------------|----------------------------------|
| <b>Name</b>      | <b>Dr. Amr nada</b>       | <b>Dr. Ghada Nashaat Mohamed</b> |
| <b>Signature</b> | د/ عمرو عبدالعزيز         | غادة نشأت                        |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Pavement design</b>                    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 325</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                              |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Introduce earth and pavement material testing, thickness design of asphalt and concrete pavements. Overlay design for pavements. Pavement construction basics are also treated.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs)<br><br>A4, B1, B2 |                                                                                                                                                                              | Course Learning Outcomes |                                                                                                                                |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Code                                                                                        | Text                                                                                                                                                                         | Code                     | Text                                                                                                                           |
| A4                                                                                          | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles. | LO1                      | Evaluate different transportation project alternatives.                                                                        |
|                                                                                             |                                                                                                                                                                              | LO2                      | Evaluate the soil classification, material strength, pavement response under loads, and structural design of flexible pavement |
| B1                                                                                          | Select appropriate technologies for construction of buildings, infrastructures using techniques of civil engineering concepts.                                               | LO3                      | Develop an understanding of engineering design and judgment using codes.                                                       |
| B2                                                                                          | Achieve an optimum design of following civil engineering topics: Transportation and Traffic, Roadways and Airports,.                                                         | LO4                      | Design asphalt concrete pavement with Different Methods                                                                        |

### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

**Course Schedule:**

| <i>Week No.</i> | <i>Scientific content of the course<br/>(Course Topics)</i> | <i>Total Weekly Hours</i> | <b>Expected number of the Learning Hours</b> |                 |                        |
|-----------------|-------------------------------------------------------------|---------------------------|----------------------------------------------|-----------------|------------------------|
|                 |                                                             |                           | <b>Theoretical teaching<br/>(lectures)</b>   | <b>Training</b> |                        |
|                 |                                                             |                           |                                              | <b>Tutorial</b> | <b>Practical / Lab</b> |
| 1               | Course introduction, flexible vs. rigid pavements.          | 3                         | 2                                            | 1               | 0                      |
| 2               | Paving materials and test procedure.                        | 3                         | 2                                            | 1               | 0                      |
| 3               | AASHTO flexible pavement design.                            | 3                         | 2                                            | 1               | 0                      |
| 4               | Asphalt institute flexible pavement design.                 | 3                         | 2                                            | 1               | 0                      |
| 5               | AASHTO rigid pavement design.                               | 3                         | 2                                            | 1               | 0                      |
| 6               | PCA rigid pavement design.                                  | 3                         | 2                                            | 1               | 0                      |
| 7               | <b>Revision and Mid Exam</b>                                |                           |                                              |                 |                        |
| 8               | Flexible overlays of flexible pavements.                    | 3                         | 2                                            | 1               | 0                      |
| 9               | Shoulder design.                                            | 3                         | 2                                            | 1               | 0                      |
| 10              | Life cycle cost analysis                                    | 3                         | 2                                            | 1               | 0                      |
| 11              | Super pave and other asphalt mixes                          | 3                         | 2                                            | 1               | 0                      |
| 12              | Course critique and review                                  | 3                         | 2                                            | 1               | 0                      |
| 13              | Design of Flexible Pavement                                 | 3                         | 2                                            | 1               | 0                      |
| 14              | REVIEW                                                      | 3                         | 2                                            | 1               | 0                      |
| 15,16           | <b>Final Exam.</b>                                          |                           |                                              |                 |                        |

### 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 5                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 10                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Tutorial and report assessment | 6 & 14                          | 20            | 20 %                             |

### 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Geotechnics of Roads :Fundamentals, Bernardo Caice, CRC PRESS, 12159 &amp; 12290, LONDON, 2019.</li> <li>Highway Engineering Volume 1 and Volume 2, Gerber.</li> <li>E. J. Yoder, M. W. Witzak "Principles of Pavement Design" ISBN:97804</li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>هندسة الطرق والمطارات د. سامي غازي</li> <li>Lecture notes</li> </ul>                                                                                                                                                                                 |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                      |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                                      |
|                                                                          | <b>Supplies</b>                                                                                                     | MS Team                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                          |

|                  |                           |                            |
|------------------|---------------------------|----------------------------|
|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b> |
| <b>Name</b>      | Dr. Amr Abd Elaziz Nada   | Dr. Ghada Nashaat Mohamed  |
| <b>Signature</b> | د/ عمرو عبد العزيز ندا    | غادة نشأت                  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Transportation Planning</b>            |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 327</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                              |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

The course is designed to give the students an advanced knowledge about Pavement management systems as well as specific issues in transportation planning and analysis of traffic accidents.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                   | <b>Course Learning Outcomes</b>                                    |                                                                                                                                             |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A4, A6, B2</b>                                                                |                                                                                                                                                                                                                                                                                                                   | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                             |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                       | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                 |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                      | <b>LO1</b>                                                         | <b>LO1.</b> Utilize Evaluate different transportation project alternatives Identify the data needed for the transportation planning process |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                          | <b>LO2.</b>                                                        | PLAN transportation project alternatives.                                                                                                   |
| <b>B2</b>                                                                        | Achieve an optimum design of pavement and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO3.</b>                                                        | Achieve the travel demand forecasting process.                                                                                              |
|                                                                                  |                                                                                                                                                                                                                                                                                                                   | <b>LO4.</b>                                                        | Transportation models for travel                                                                                                            |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        | √          |                       | √                  | √          |                | √          |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)              | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|---------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                               |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                               |                    |                                       | Tutorial | Practical / Lab |
| 1        | PLAN Urban and regional transportation planning               | 3                  | 2                                     | 1        | --              |
| 2        | Travel forecasting                                            | 3                  | 2                                     | 1        | --              |
| 3        | Transportation Planning stages                                | 3                  | 2                                     | 1        | --              |
| 4        | Problem definition and identification of goals and objectives | 3                  | 2                                     | 1        | --              |
| 5        | Data collection                                               | 3                  | 2                                     | 1        | --              |
| 6        | Trip generation                                               | 3                  | 2                                     | 1        | --              |
| 7        | Revision and Mid Exam                                         |                    |                                       |          |                 |
| 8        | Trip distribution                                             | 3                  | 2                                     | 1        | --              |

|       |                                                            |   |   |   |    |
|-------|------------------------------------------------------------|---|---|---|----|
| 9     | Modal split                                                | 3 | 2 | 1 | -- |
| 10    | Traffic assignment and network planning                    | 3 | 2 | 1 | -- |
| 11    | Assessment of Transportation Projects                      | 3 | 2 | 1 | -- |
| 12    | Case studies and applications                              | 3 | 2 | 1 | -- |
| 13    | Transportation models for travel demand forecasting stages | 3 | 2 | 1 | -- |
| 14    | Capacity analysis and level of service                     | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                         |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 5                               | 10            | 10%                              |
| 2   | Exam 2 written (Semester work) | 10                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Final Oral Exam                | 14                              | 5             | 5%                               |
| 6   | Assignments / Project          | weekly                          | 15            | 15%                              |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | TRANSPORTATION ENGINEERING<br>BEVERLY T.KUHN 2019. 12309                                                                                                                                                                                                      |
|                                                                  | <b>Other References</b>                                                                                             | Salter, R.J and Hounsell, N.B. (1996)<br>Highway Traffic Analysis and Design.<br>Palgrave ISBN 0-333-60903-4<br>“Principles of G. Venkatappa Rao<br>transportation and highway engineering”<br>Tata McGraw-Hill, New Delhi,<br>ISBN:9780074623633, 007462363X |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | -----                                                                                                                                                                                                                                                         |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp;</b>                               | <b>Devices/Instruments</b>                                                                                          | Data show                                                                                                                                                                                                                                                     |
|                                                                  | <b>Supplies</b>                                                                                                     | -----                                                                                                                                                                                                                                                         |



|                                                              |                                |       |
|--------------------------------------------------------------|--------------------------------|-------|
| <b>equipment<br/>for<br/>teaching<br/>and<br/>learning *</b> | <b>Electronic Programs</b>     | ----- |
|                                                              | <b>Skill Labs/ Simulators</b>  | ----- |
|                                                              | <b>Virtual Labs</b>            | ----- |
|                                                              | <b>Other (to be mentioned)</b> | ----- |

|                  | <b>Course Coordinator</b>      | <b>Program Coordinator</b>       |
|------------------|--------------------------------|----------------------------------|
| <b>Name</b>      | <b>Dr. Amr Abd Elaziz Nada</b> | <b>Dr. Ghada Nashaat Mohamed</b> |
| <b>Signature</b> | د/ عمرو عبدالعزيز ندا          | غادة نشأت                        |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                                      |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Selected Topics in Transportation Engineering</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 329</b>                                       |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                    |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                                   | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                    | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                             |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                      |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                    |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>                |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                                         |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department            |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                                   |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Selected Topics among the Following: Pavement Systems and Management, Specific Issues in Transportation Planning, Advanced Techniques in Materials and Pavement Characterization, Traffic Models, Analysis of Traffic Accidents.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                            | <b>Course Learning Outcomes</b>                                    |                                                                                                                                |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A4, A6, B1, B2</b>                                                    |                                                                                                                                                                                                                                                                                                                            | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                | <b>Code</b>                                                        | <b>Text</b>                                                                                                                    |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                          | <b>LO 1.</b>                                                       | Evaluate different transportation project alternatives                                                                         |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.        | <b>LO 2</b>                                                        | Evaluate the soil classification, material strength, pavement response under loads, and structural design of flexible pavement |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                               | <b>LO 3</b>                                                        | Utilize code practices and standard to design pavement responses under the loads                                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                            | <b>LO 4</b>                                                        | Utilize the data required for design of flexible pavement                                                                      |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                   | <b>LO 5</b>                                                        | PLAN transportation project alternatives.                                                                                      |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and | <b>LO 6</b>                                                        | Select the suitable pavement materials                                                                                         |

|           |                                                                                                                                                                                                                                                                                                                   |             |                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------|
|           | Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                                                                                                                  |             |                                                                 |
| <b>B2</b> | Achieve an optimum design of pavement and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO 7</b> | Achieve optimum design OF flexible pavement and rigid pavement. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        | √          |                       | √                  | √          |                | √          |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics) | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                  |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                  |                    |                                       | Tutorial | Practical / Lab |
| 1        | Soil stabilization                               | 3                  | 2                                     | 1        | --              |
| 2        | Tests of asphalt materials                       | 3                  | 2                                     | 1        | --              |

|       |                                                               |   |   |   |    |
|-------|---------------------------------------------------------------|---|---|---|----|
| 3     | Pavement distress                                             | 3 | 2 | 1 | -- |
| 4     | pavement Management systems                                   | 3 | 2 | 1 | -- |
| 5     | Soil Strength and Soil Stabilization                          | 3 | 2 | 1 | -- |
| 6     | Pavement rehabilitation program                               | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                  |   |   |   |    |
| 8     | Pavement Response under Load (Stress and Deflection)          | 3 | 2 | 1 | -- |
| 9     | Highway capacity and level of service                         | 3 | 2 | 1 | -- |
| 10    | Capacity and level of service at intersections                | 3 | 2 | 1 | -- |
| 11    | Operation analysis                                            | 3 | 2 | 1 | -- |
| 12    | The importance of road safety and causes of traffic accidents | 3 | 2 | 1 | -- |
| 13    | Accident costing                                              | 3 | 2 | 1 | -- |
| 14    | Accident analysis and prevention                              | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                            |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 5                               | 10            | 10%                              |
| 2   | Exam 2 written (Semester work) | 10                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Final Oral Exam                | 14                              | 5             | 5%                               |
| 6   | Assignments / Project          | weekly                          | 15            | 15%                              |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | TRANSPORTATION ENGINEERING<br>BEVERLY T.KUHN 2019. 12309                                                                                                                                                                                                      |
|                                                                          | <b>Other References</b>                                                                                             | Salter, R.J and Hounsell, N.B. (1996)<br>Highway Traffic Analysis and Design.<br>Palgrave ISBN 0-333-60903-4<br>“Principles of G. Venkatappa Rao<br>transportation and highway engineering”<br>Tata McGraw-Hill, New Delhi,<br>ISBN:9780074623633, 007462363X |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | -----                                                                                                                                                                                                                                                         |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data show                                                                                                                                                                                                                                                     |
|                                                                          | <b>Supplies</b>                                                                                                     | -----                                                                                                                                                                                                                                                         |
|                                                                          | <b>Electronic Programs</b>                                                                                          | -----                                                                                                                                                                                                                                                         |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | -----                                                                                                                                                                                                                                                         |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | -----                                                                                                                                                                                                                                                         |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | -----                                                                                                                                                                                                                                                         |

|                  |                           |                            |
|------------------|---------------------------|----------------------------|
|                  | <b>Course Coordinator</b> | <b>Program Coordinator</b> |
| <b>Name</b>      | Dr. Amr Abd Elaziz Nada   | Dr. Ghada Nashaat Mohamed  |
| <b>Signature</b> | د/ عمرو عبد العزيز ندا    | غادة نشأت                  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Introduction to GPS</b>                |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 331</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                              |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Basic idea of GPS, reference, ellipsoid, coordinates, projection, GPS segment, GPS observables, GPS errors, models of calculations, GPS techniques, and applications of GPS. Other satellites system: Galileo and GLONNAS.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | Course Learning Outcomes                                    |                                                                                                                                                                                           |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A2, A6, and B1                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | Upon completion of the course, the student will be able to: |                                                                                                                                                                                           |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                        | Code                                                        | Text                                                                                                                                                                                      |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | LO1                                                         | Adjustment of surveying observations using least squares technique.                                                                                                                       |
| A6                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | LO2                                                         | Understanding and knowledge of the basic idea of the Global Positioning System GPS.                                                                                                       |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                             | LO3                                                         | Knowledge of GPS observations, modes of calculation, and techniques of observations, and sources of errors.                                                                               |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO4                                                         | Understanding of using surveying techniques and instruments in measuring and calculating the deformation of all kinds of structures, such as: buildings, bridges, dams, antiquities, etc. |



#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        | √          |                       | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                    | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                        |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                        |                    |                                       | Tutorial | Practical / Lab |
| 1        | Review of the statistics of univariate, mean, and standard deviation                   | 3                  | 2                                     | 1        | 0               |
| 2        | Definition of multi-variate, covariance between any two components of multi-variate    | 3                  | 2                                     | 1        | 0               |
| 3        | Definition of correlation, characteristics of correlation. Computation of correlation  | 3                  | 2                                     | 1        | 0               |
| 4        | Concept of error propagation. Variance law. applications                               | 3                  | 2                                     | 1        | 0               |
| 5        | Concept of error propagation. Covariance law. Applications                             | 3                  | 2                                     | 1        | 0               |
| 6        | Introduction to the Global Positioning System GPS: basic idea – segments-observations. | 3                  | 2                                     | 1        | 0               |
| 7        | <b>Revision and Mid Exam</b>                                                           |                    |                                       |          |                 |
| 8        | Revision                                                                               | 3                  | 2                                     | 1        | 0               |

|       |                                                                                                                   |   |   |   |   |
|-------|-------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 9     | Introduction to GPS: errors sources – modes of calculations – techniques of observations.                         | 3 | 2 | 1 | 0 |
| 10    | Applications of GPS                                                                                               | 3 | 2 | 1 | 0 |
| 11    | Applications of GPS                                                                                               | 3 | 2 | 1 | 0 |
| 12    | Measuring deformation of structures: methods of calculating and adjusting observations with appropriate accuracy. | 3 | 2 | 1 | 0 |
| 13    | Measuring deformation of structures: methods of calculating and adjusting observations with appropriate accuracy. | 3 | 2 | 1 | 0 |
| 14    | Measuring deformation of structures: methods of calculating and adjusting observations with appropriate accuracy. | 3 | 2 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                                                                                                |   |   |   |   |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work)            | 4                               | 5             | 5 %                              |
| 2   | Quiz 2 written (Semester work)            | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 5   | Final Practical/Clinical/... Exam         | -                               | 0             | 0 %                              |
| 6   | Final Oral Exam                           | -                               | 0             | 0 %                              |
| 7   | Assignments / Project /Portfolio/ Logbook | 1-13                            | 25            | 25 %                             |

#### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                           |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | Ramakant Agrawal, Parshottam Sarathe, "Advanced Surveying: Theory & Practice", Nelson Mandela Marg, Vasant Kunj, New Delhi, 110070, 2020. |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          | <b>Other References</b>                            | <p>- Barry Kavanagh, Diane Slattery, " Surveying with Construction Applications", 8th Edition, ISBN-10: 9780132766982, Pearson, 2014.</p> <p>- GPS: Theory and practice: B. Hormann – Wellenhof, Springer-Verlag, New York, ISBN-13: 978-3-211-82364-4, 1992.</p> <p>- Matrix treatment of adjustment computations in surveying: M. Nassar, faculty of engineering, Ain Shams University, 2001.</p> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://www.scribd.com/document/686623844/Advanced-Surveying">https://www.scribd.com/document/686623844/Advanced-Surveying</a>                                                                                                                                                                                                                                                             |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show,                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Supplies</b>                                    | --                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Other</b> (to be mentioned)                     | --                                                                                                                                                                                                                                                                                                                                                                                                  |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | Dr. Amr Abd Elaziz Nada                                                             | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                                                                    |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Adjustment Computation in Surveying and Monitoring of Structure Deformation</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 333</b>                                                                     |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                                                  |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                                                                 | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                                                  | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                                                           |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                                                    |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                                                  |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>                                              |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                                                                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department                                          |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                                                                 |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Sources and types of errors, Review of theory of errors: mean, variance, standard deviation, Error propagation: covariance, correlation between observations. Variance- covariance matrix, variance law-covariance law. Monitoring of structural deformation: types of deformation, techniques to measure deformation. Calculations and checks.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                   |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>A2, A6, and B1</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                   |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                       |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Conduct appropriate experimentation on GIS application in the field.                              |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                    | <b>LO2</b>                                                         | Plan to achieve the latitude and longitude.                                                       |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                                                         | Select the appropriate technology to use the remote sensing, aerial photos, and satellite images. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        | √          |                       | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                   | Total Weekly Hours | Expected number of the Learning Hours |          |                |
|----------|-------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|----------------|
|          |                                                                                                       |                    | Theoretical teaching<br>(lectures)    | Training |                |
|          |                                                                                                       |                    |                                       | Tutorial | Practical /Lab |
| 1        | <b><u>Spherical Astronomy</u></b> : definitions-astronomical coordinates.                             | 3                  | 2                                     | 1        | 0              |
| 2        | Determination of latitude, longitude.                                                                 | 3                  | 2                                     | 1        | 0              |
| 3        | Determination Of time: sidereal time, solar time, standard time, local time.                          | 3                  | 2                                     | 1        | 0              |
| 4        | Stars & observation instruments.                                                                      | 3                  | 2                                     | 1        | 0              |
| 5        | <b><u>Geographic information system (GIS)</u></b> :<br>Introduction (GIS), kinds of used information, | 3                  | 2                                     | 1        | 0              |
| 6        | (GIS) kinds of used information,                                                                      | 3                  | 2                                     | 1        | 0              |
| 7        | <b>Revision and Mid Exam</b>                                                                          |                    |                                       |          |                |
| 8        | Applications of GIS in the field: roads, sanitary engineering, water resources harbors.               | 3                  | 2                                     | 1        | 0              |

|       |                                                                                                                                         |   |   |   |   |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 9     | <b><u>Remote Sensing:</u></b><br>Introduction to remote sensing (basics & principal).                                                   | 3 | 2 | 1 | 0 |
| 10    | Introduction to aerial photos                                                                                                           | 3 | 2 | 1 | 0 |
| 11    | Introduction to satellite images interpretations.                                                                                       | 3 | 2 | 1 | 0 |
| 12    | Introduction to satellites: Ocean monitoring, Metrological monitoring, Terrestrial monitoring (like: Land sat, Spot, Indian satellite.) | 3 | 2 | 1 | 0 |
| 13    | Application of Remote sensing.                                                                                                          | 3 | 2 | 1 | 0 |
| 14    | Application of Remote sensing.                                                                                                          | 3 | 2 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                                                                                                                      |   |   |   |   |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work)            | <b>4</b>                        | <b>5</b>      | <b>5 %</b>                       |
| 2   | Quiz 2 written (Semester work)            | <b>11</b>                       | <b>10</b>     | <b>10 %</b>                      |
| 3   | Midterm exam                              | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 4   | Final Written Exam                        | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 5   | Final Practical/Clinical/... Exam         | -                               | <b>0</b>      | <b>0 %</b>                       |
| 6   | Final Oral Exam                           | -                               | <b>0</b>      | <b>0 %</b>                       |
| 7   | Assignments / Project /Portfolio/ Logbook | <b>1:13</b>                     | <b>25</b>     | <b>25 %</b>                      |

#### **6- Learning Resources and Supportive Facilities \***

|                                                          |                                                                                                                     |                                                                          |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references)</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | William Irvine, "Surveying for construction", London: McGraw-Hill, 2021. |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ces,<br>etc.) *                                                          | <b>Other References</b>                            | <p>- Agor, R., "A Textbook of Advanced Surveying", ISBN-10:8174090533, Khanna Publishers, 2016.</p> <p>- Bannister, A., Raymond, S. and Baker, R., "Surveying", 6th Edition, ISBN 10: 0582302498, Prentice Hall, 1998.</p> <p>- Dr. B. C. Punmia , Ashok, K. J. , Arun, K. J.   Laxmi "Surveying Volume 2", 8th Edition, National Institute of Technology Goa Farmagudi, Ponda, Goa - 403 401, 2018.</p> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://www.rexresearch1.com/SurveyingLibrary/SurveyingfConstruction.pdf">https://www.rexresearch1.com/SurveyingLibrary/SurveyingfConstruction.pdf</a>                                                                                                                                                                                                                                          |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show,                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Supplies</b>                                    | --                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Other (to be mentioned)</b>                     | --                                                                                                                                                                                                                                                                                                                                                                                                       |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr. Amr Abd Elaziz Nada                                                             | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Sanitary Engineering (2)</b>           |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 251</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Fadia Salem                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Characteristics and sources of waste water. Types of sewage systems: combined and separate. Collection works: design of gravity networks, waste water pump stations, force mains. Primary treatment works: approach channel, screens, grit removal chamber, and primary sedimentation. Secondary or biological treatment works using: trickling filters, activated sludge system, waste stabilization ponds, final sedimentation. Design of sludge treatment and disposal: sludge thickeners, sludge digestion. Different methods of sludge dewatering. Disposal of sewage by: dilution,

land treatment.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS) (according to the matrix in the program specs.)</b> |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                 |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>(A2, A3, A4, B1, B2)</b>                                                    |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                 |
| <b>Code</b>                                                                    | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                     |
| A2                                                                             | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | LO1                                                                | Enable the student to calculate and predict the ultimate water treatment and distribution networks' capacities. |
| A3                                                                             | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | LO2                                                                | Develop the student's understanding of water treatment processes to design sustainable cost-effective systems.  |
| A4                                                                             | Utilize contemporary technologies, codes of practice and standards,                                                                                                                                                                                                                                                 | LO3                                                                | Develop the student's Engineering design                                                                        |

|    |                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                                                                                    |     | capabilities for water treatment works and distribution systems according to the latest literature and codes of practice.                                        |
| B1 | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO4 | Enable the student to select the optimum water treatment and distribution technologies to ensure the provision of safe treated water to the different consumers. |
| B2 | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.                                              | LO5 | Prepare the student to design and plan water treatment plants and distribution systems                                                                           |

#### 4-Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology- Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|-------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                       | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                | √          | √             |                    |                                           | √            |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                    | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                        |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                        |                    |                                       | Tutorial | Practical / Lab |
| 1        | Sources of sewage and characteristics of wastewater                                                                                    | 4                  | 2                                     | 1        | 1               |
| 2        | Types of Sewerage Systems.<br>Organizing a field trip to a water treatment plant, with a practical explanation of the basic processes. | 4                  | 2                                     | 1        | 1               |
| 3        | Sewers' design                                                                                                                         | 4                  | 2                                     | 1        | 1               |
| 4        | Design of Sewage Pumping Stations and a Visit to a Wastewater Treatment Plant, Linked to the Lecture Content on Biological Treatment.  | 4                  | 2                                     | 1        | 1               |
| 5        | Introduction to sewage treatment                                                                                                       | 4                  | 2                                     | 1        | 1               |
| 6        | Primary Treatment (Approach channel and Screens)                                                                                       | 4                  | 2                                     | 1        | 1               |

|       |                                                                     |   |   |   |   |
|-------|---------------------------------------------------------------------|---|---|---|---|
| 7     | Revision + Midterm Exam                                             |   |   |   |   |
| 8     | Primary Treatment (Grit Removal Chambers and Primary Sedimentation) | 4 | 2 | 1 | 1 |
| 9     | Secondary Treatment – Trickling filters                             | 4 | 2 | 1 | 1 |
| 10    | Secondary Treatment – Activated sludge systems                      | 4 | 2 | 1 | 1 |
| 11    | Final Sedimentation                                                 | 4 | 2 | 1 | 1 |
| 12    | Treated sewage disposal and reuse                                   | 4 | 2 | 1 | 1 |
| 13    | Sludge treatments                                                   | 4 | 2 | 1 | 1 |
| 14    | Sludge disposal                                                     | 4 | 2 | 1 | 1 |
| 15,16 | Final Exam                                                          |   |   |   |   |

### **Experiment Topics:**

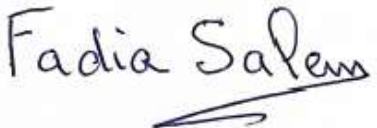
| Experiment |
|------------|
| BOD Test   |
| COD Test   |
| DO Test    |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *                       | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work)             | <b>11</b>                       | <b>15</b>     | <b>15%</b>                       |
| 2   | Midterm exam                               | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 3   | Final Written Exam                         | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 4   | Final Practical                            | <b>13</b>                       | <b>5</b>      | <b>5%</b>                        |
| 5   | Tutorial and report assessment (Term Work) | <b>weekly</b>                   | <b>20</b>     | <b>20%</b>                       |

## 6- Learning Resources and Supportive Facilities

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Wastewater Treatment: Concepts And Practices, Ronald Hogan, Syrawood, 12301, NEW YORK, 2019.</li> <li>Waste Water Recycling and Management, Sadhan Kumar Ghosh, Springer, 12302, SINGAPORE, 2019.</li> </ul>                                                                                                                               |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Water Supply and Pollution Control 7th edition; Warren Viessman, Jr. &amp; Mark J. Hamer</li> <li>Egyptian Code of Practice for wastewater treatment design, 1998 Ministerial decree 52/1998</li> <li>Warren Viessman, Water Supply and Pollution Control, 2009, Pearson Prentice Hall, Upper Saddle River, ISBN:9780132337175.</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKP – Microsoft Office                                                                                                                                                                                                                                                                                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board, Laptop                                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Supplies</b>                                                                                                     | Power point lectures - MS Team                                                                                                                                                                                                                                                                                                                                                    |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | BOD Test, COD Test                                                                                                                                                                                                                                                                                                                                                                |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                            |
|------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Fadia Salem</b>                                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                      |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Irrigation works Design (2)</b>        |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 252</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Samah Hassan                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Heading Up Structures: Overflow and Standing Wave Weirs, Head and Partial Regulators, Barrages. Navigation Structures: Locks, Gates, Navigation Connections. Crossing Structures: Siphons, Aqueducts, and Tunnels. Storage Structures: Dams (Aswan Dam, High Dam).

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                         |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A3, B1, B2</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                         |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                             |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                                                         | Apply engineering design processes to develop problem-solving techniques and analysis for the students using creative thinking of hydraulic structures. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | The principles of sustainable design and development.                                                                                                   |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | Principles of design including elements design, process and/or a system related to Civil Engineering.                                                   |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                                                         | Utilize limitations and parameters of designing structures; calculate and perform empirical dimensions of heading-up structures.                        |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO5</b>                                                         | Study hydraulic structures and evaluate safety aspects like percolation, scour, uplift downstream of hydraulic structures.                              |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.                                              | <b>LO6</b>                                                         | Design flow floor types using real data & solve problems analytically and mathematically.                                                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO7</b>                                                         | Show different solutions to expected/unexpected problems and propose solutions based on analytical thinking.                                            |



#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            |                       |                    | √          |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                                                                                                                                                                                             | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                                                              |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                                                                                                                                              |                    |                                       | Tutorial | Practical / Lab |
| 1        | Studying Introduction of the Heading up work, the course outline and Introduction of the weir.                                                                                                                                               | 4                  | 2                                     | 1        | 1               |
| 2        | Main function of the weirs and describing its types. Defining the main elements                                                                                                                                                              | 4                  | 2                                     | 1        | 1               |
| 3        | Hydraulic design of the weirs. Problems taking into account in designing heading up works (creep & scour) + Quiz                                                                                                                             | 4                  | 2                                     | 1        | 1               |
| 4        | Design of floor by using the empirical dimension and check safety.<br>Field Visits Organize visits to local irrigation projects, dam sites, or water treatment facilities.<br>Provide students with observation tasks and reflection sheets. | 4                  | 2                                     | 1        | 1               |

|       |                                                                                                                                                                                                                                                                                                |   |   |   |   |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 5     | Precautions against scouring and creeping phenomena.                                                                                                                                                                                                                                           | 4 | 2 | 1 | 1 |
| 6     | Structure design of weirs<br>Check of the floor against (uplift)                                                                                                                                                                                                                               | 4 | 2 | 1 | 1 |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                                                                                                                   |   |   |   |   |
| 8     | Heading up structures (Regulators)<br>Main function of the Regulators and describing its types. Defining the main elements<br><i>Practical Workshops Conduct hands-on sessions using simulation software or models to explore dam design and water flow</i>                                    | 4 | 2 | 1 | 1 |
| 9     | Design and Check stability of the gate, gate lifting structure, pier, and abutment. +Quiz .<br><br><i>Simplified field visits are organized with guided worksheets, focusing on observation and linking theory to practice.</i>                                                                | 4 | 2 | 1 | 1 |
| 10    | Structure design, Cases of loading and Check stability of pier and abutment.<br><i>Program Exposure Introduce students to specialized software (e.g., HEC-RAS, AutoCAD Civil 3D) used in water engineering.</i><br><i>Assign mini-projects using these tools to solve real-world problems.</i> | 4 | 2 | 1 | 1 |
| 11    | Design and check stability of the floor in the longitudinal and transverse direction. + Quiz                                                                                                                                                                                                   | 4 | 2 | 1 | 1 |
| 12    | Hydraulic calculation of locks, describing locks types, main function, and empirical design of main elements of the locks.<br>Design of lock chamber and thrust wall                                                                                                                           | 4 | 2 | 1 | 1 |
| 13    | Dams, describing Dams types, main function, and main elements of the Dams.<br>The factors affecting on dams.                                                                                                                                                                                   | 4 | 2 | 1 | 1 |
| 14    | Revision                                                                                                                                                                                                                                                                                       | 4 | 2 | 1 | 1 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                                                                                                             |   |   |   |   |

**Experiment Topics: (If any)**

| Serial | Experiment                                   |
|--------|----------------------------------------------|
| 1      | Experimental work for open channel hydraulic |

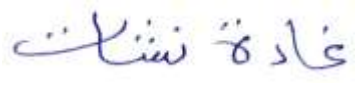
**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 3                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project          | 10                              | 15            | 15%                              |
| 6   | Final Practical                | 13                              | 5             | 5 %                              |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>S.K. Sharma, Hydraulic Structures Design of Irrigation Structures, RSM Press, ISBN-13: 978-9352533770, January 2017.</li> <li>K Subramanya, Engineering Water, Tata McGraw–Hill, 3rd Ed., 2008.</li> </ul>                                                                              |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Hydraulic Structures, Fourth Edition by P. Novak, A.I.B. Moffat, et al., Feb 25, 2007.</li> <li>Pavel Novak and C. Nalluri, Hydraulics Structures, Taylor &amp; Francis, 2007.</li> <li>Nazeih Assaad Younan, Design Textbooks in Civil Engineering – Irrigation Structures.</li> </ul> |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>WWW. Irrigation Structures.</li> </ul>                                                                                                                                                                                                                                                  |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                         |
| <b>Supportive facilities &amp; equipment</b>                     | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                                                                                         |
|                                                                  | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                                                                                                             |
|                                                                  | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                             |

|                                      |                        |    |
|--------------------------------------|------------------------|----|
| for<br>teaching<br>and<br>learning * | Skill Labs/ Simulators | -- |
|                                      | Virtual Labs           | -- |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Ass. Prof. Samah Hassan</b>                                                    | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Foundation Engineering (2)</b>         |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 253</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 3                                         | 1                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed Nabil                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Types of foundation systems and design criteria, design of shallow foundations and deep foundations, construction methods, effects of construction on nearby structures, special topics and case studies.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | Course Learning Outcomes                                    |                                                                                                                                           |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| A3, A4, B1, B2, B3                                                        |                                                                                                                                                                                                                                                                                                                     | Upon completion of the course, the student will be able to: |                                                                                                                                           |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                | Code                                                        | Text                                                                                                                                      |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | LO1                                                         | Identify the difference deep foundations to solve engineering problems related to it by applying engineering fundamentals                 |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO2                                                         | Apply theoretical and field methods in calculating pile capacity                                                                          |
| A4                                                                        | Utilize contemporary technologies, Codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | LO3                                                         | Employ the Egyptian code in calculating the pile number, the efficiency of grouping, the settlement of the pier, and the pile cap design. |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                                                                                                                                     |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>B1</b> | <b>Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.</b> | <b>LO4</b> | <b>Select the appropriate pile according to soil type, structure load, and site constraint.</b>                                                     |
| <b>B2</b> | <b>Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.</b>                                              | <b>LO5</b> | <b>Achieve optimum design method of raft foundation using the computer program and Egyptian code.</b>                                               |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>LO6</b> | <b>Determine the pile capacity to check the safety requirement of piled foundation according to Egyptian code.</b>                                  |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>LO7</b> | <b>Understand engineering principles in the field of reinforced concrete in the analysis and design of pile caps</b>                                |
| <b>B3</b> | <b>Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.</b>                                                                                                                                                                                                 | <b>LO8</b> | <b>Explain professional ethics and the impacts of using supporting excavation systems on the safety of nearby different engineering structures.</b> |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    | √                      |            | √                     |                    | √          |                |            |               |                    | √                                        |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                             | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                 |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                 |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to types of raft foundation and use computer program in design of raft foundation. | 4                  | 3                                     | 1        | --              |
| 2        | Design the raft footing using Egyptian code equation                                            | 4                  | 3                                     | 1        | --              |
| 3        | Pile Classification and method of construction                                                  | 4                  | 3                                     | 1        | --              |
| 4        | Selection of pile type.                                                                         | 4                  | 3                                     | 1        | --              |
| 5        | Determination of single pile capacity using structure method, and static equation               | 4                  | 3                                     | 1        | --              |
| 6        | Calculating pile capacity using pile load test                                                  | 4                  | 3                                     | 1        | --              |



|       |                                                                                                         |   |   |   |    |
|-------|---------------------------------------------------------------------------------------------------------|---|---|---|----|
| 7     | Revision and Mid Exam                                                                                   |   |   |   |    |
| 8     | Determination of pile capacity using, field measurements,<br><b>Review quiz and midterm results</b>     | 4 | 3 | 1 | -- |
| 9     | Check group pile efficiency,                                                                            | 4 | 3 | 1 | -- |
| 10    | Calculation of pile group settlement.                                                                   | 4 | 3 | 1 | -- |
| 11    | Design of pile cap under vertical load and moment                                                       | 4 | 3 | 1 | -- |
| 12    | Introduction to earth pressure and types of sheet pile wall                                             | 4 | 3 | 1 | -- |
| 13    | Full Design of cantilever sheet pile.<br><b>Integrate two to three case studies on pile foundations</b> | 4 | 3 | 1 | -- |
| 14    | Full Design of retaining wall                                                                           | 4 | 3 | 1 | -- |
| 15,16 | Final Exam.                                                                                             |   |   |   |    |

### 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 6                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project          | Weekly                          | 20            | 20 %                             |

### 6- Learning Resources and Supportive Facilities \*

|                                                           |                                                                                                           |                                                                                     |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Learning resources (books, scientific references, etc.) * | The main (essential) reference (must be written in full according to the scientific documentation method) | Donald P. Coduto." Geotechnical Engineering: Principles and Practices" INDIA, 2018. |
|                                                           | Other References                                                                                          | Abd El-Rahman Hindi. "Foundation Design" (2020)                                     |
|                                                           | Electronic Sources (Links must be added)                                                                  | <a href="http://www.geotechnical.net">www.geotechnical.net</a>                      |

|                                                                          |                                                    |                        |
|--------------------------------------------------------------------------|----------------------------------------------------|------------------------|
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board |
|                                                                          | <b>Supplies</b>                                    | --                     |
|                                                                          | <b>Electronic Programs</b>                         | --                     |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                     |
|                                                                          | <b>Virtual Labs</b>                                | --                     |
|                                                                          | <b>Other</b> (to be mentioned)                     | --                     |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Dr. Ahmed Nabil</b>                                                            | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Reinforced Concrete (4)</b>            |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 254</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Prestressed concrete elements: Introduction, stresses under working loads, ultimate loads and flexural strength, shear, camber and deflection, dimensioning. Tall buildings under lateral loads, lateral load resisting systems. Repair of concrete structures, and special structures.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                            | <b>Course Learning Outcomes</b>                                    |                                                                                                                                        |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A4, A10, B1, B2</b>                                                   |                                                                                                                                                                                                                                                                                                                            | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                        |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                | <b>Code</b>                                                        | <b>Text</b>                                                                                                                            |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                          | <b>LO1</b>                                                         | Identify the concrete properties of flexure, and shear members to solve engineering based design problems by applying design formulas. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                            | <b>LO2</b>                                                         | Conduct design parameters of flexure, shear, and normal members.                                                                       |
|                                                                                  |                                                                                                                                                                                                                                                                                                                            | <b>LO3</b>                                                         | Employ the Egyptian code in design of flexure, shear and normal members                                                                |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.        | <b>LO4</b>                                                         | List the design methodologies for design of short cantilever.                                                                          |
|                                                                                  |                                                                                                                                                                                                                                                                                                                            | <b>LO5</b>                                                         | Describe the different types of lateral load systems.                                                                                  |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                               | <b>LO6</b>                                                         | Apply design process of reinforced concrete elements and pre-stressed system to produce cost-effective design.                         |
| <b>A10</b>                                                                       | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.                                                                                                                                                                                                                                | <b>LO7</b>                                                         | Utilize code practices and standard to design appropriate specials deep beam, corbels and pre-stressed concrete.                       |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and | <b>LO8</b>                                                         | Calculate the axial loads acting on beams.                                                                                             |
|                                                                                  |                                                                                                                                                                                                                                                                                                                            | <b>LO9</b>                                                         | Utilize the Egyptian code in design and construction of pre-stressed concrete structures.                                              |
|                                                                                  |                                                                                                                                                                                                                                                                                                                            | <b>LO10</b>                                                        | Select the appropriate structural system.                                                                                              |

|           |                                                                                                                                                                                                                                                                                                                                                                 |             |                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------|
|           | Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                                                                                                                                                                |             |                                                                                     |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources, and Harbors; or any other emerging field relevant to the discipline. | <b>L011</b> | Achieve optimum design of special lateral load-system and flexure, torsion members. |
|           |                                                                                                                                                                                                                                                                                                                                                                 | <b>L12</b>  | Analyse the shear and torsion strength of concrete and safe design to wind load.    |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                 | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|---------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                     |                    |                                       | Tutorial | Practical / Lab |
| 1        | Revision on the design methodology                                                                                  | 3                  | 2                                     | 1        | ---             |
| 2        | Introduction to pre-stressed concrete                                                                               | 3                  | 2                                     | 1        | ---             |
| 3        | Types of pre-stressed concrete – Properties of pre-stressing reinforcement steel.                                   | 3                  | 2                                     | 1        | ---             |
| 4        | Losses of pre-stressed – Profiles of pre-stressing tendons.                                                         | 3                  | 2                                     | 1        | ---             |
| 5        | Equivalent loads on pre-stressing elements – analysis of beam section under service loads.                          | 3                  | 2                                     | 1        | ---             |
| 6        | Analysis of pre-stressing beam section under ultimate load.                                                         | 3                  | 2                                     | 1        | ---             |
| 7        | <b>Revision and Mid Exam</b>                                                                                        |                    |                                       |          |                 |
| 8        | Design of halls, introduction, wide span structures, different statical systems, general layout, design of girders. | 3                  | 2                                     | 1        | ---             |
| 9        | Check & design of end zone of pre-stressing elements- Full detailed drawing of pre-stressing members.               | 3                  | 2                                     | 1        | ---             |
| 10       | Design and analysis of reinforced concrete corbels.                                                                 | 3                  | 2                                     | 1        | ---             |
| 11       | Design and analysis of reinforced concrete deep beams.                                                              | 3                  | 2                                     | 1        | ---             |
| 12       | Introduction on lateral load design for wind and earthquakes                                                        | 3                  | 2                                     | 1        | ---             |
| 13       | Lateral load elements and resisting systems – Calculation of the applied loads on the resisting systems.            | 3                  | 2                                     | 1        | ---             |
| 14       | Design for lateral load resisting systems.                                                                          | 3                  | 2                                     | 1        | ---             |
| 15,16    | <b>Final Exam.</b>                                                                                                  |                    |                                       |          |                 |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) Quiz1      | 6                               | 7.5           | 7.5%                             |
| 2   | Exam 2 written (Semester work) Quiz2      | 8                               | 7.5           | 7.5%                             |
| 3   | Presentation                              | 11                              | 10            | 10%                              |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15                              | 40            | 40 %                             |
| 7   | Assignments / Project /Portfolio/ Logbook | 6,11                            | 15            | 15%                              |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>DESIGN OF CONCRETE STRUCTURES DAVID DARWIN 2016</li> <li>Design of reinforced concrete structures: Dr. M. Goneem 2019</li> <li>Design and construction of reinforced concrete structures ECP-203-2018</li> <li>Loads applied on building ECP-208</li> </ul>                                                                                                                                                                      |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>ASCE: American society of civil Engineering.</li> <li>BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                                                                  |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html</a></li> <li><a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li><a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Supportive facilities &amp; equipment</b>                     | <b>Devices/Instruments</b>                                                                                          | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                  | <b>Supplies</b>                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | <b>Electronic Programs</b>                                                                                          | AutoCAD program                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                                      |                        |                                |
|--------------------------------------|------------------------|--------------------------------|
| for<br>teaching<br>and<br>learning * |                        | CSI programs (SAP), PowerPoint |
|                                      | Skill Labs/ Simulators |                                |
|                                      | Virtual Labs           |                                |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Prof. Essam Khalifa</b>                                                        | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Steel Structures (3)</b>               |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 255</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 2                |                        | 4            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Mohammed Fathi Belal                  |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Fundamentals and Principles of Steel Bridges. Egyptian code. Distinctive features, Analysis procedure and Design of the most widely used Bridge Systems. Loads, Deck Systems and Structural Systems. Structural Systems include Truss Bridges, Plate Girder Bridges, Parallel Girder Systems, Stiffened Suspension Bridges and Cable Stayed Bridges. Analysis and design of hot rolled beams and plate girders for roadway bridges. Additional topics include orthotropic

plate decks, grid reinforced decks, bracing and bearing systems, structural details and elastomeric bearings.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                                 |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A4, A10, B1, B2</b>                                                   |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                 |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                                     |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                  | <b>LO1</b>                                                         | Choose the structural system for the steel bridge.                                                                              |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO2</b>                                                         | Calculate the loads on a steel bridge and their components design strength.                                                     |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO3</b>                                                         | Apply the design specification requirements to get the most economic cross-sections for floor beams.                            |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | <b>LO4</b>                                                         | Compute the design strength for the beams of the bridge according to the Egyptian code of practice                              |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO5</b>                                                         | Design structural connections that are integrated parts of the overall structural design.                                       |
| <b>A10</b>                                                                       | Acquire and apply new knowledge; and practice self, lifelong, and other learning strategies.                                                                                                                                                                                                                        | <b>LO6</b>                                                         | Develop student ability of to self-extract and manipulate data from different sources, textbooks, and international codes.      |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical                                                                                                                                                  | <b>LO7</b>                                                         | Utilize advanced numerical techniques like computer software packages (SAP2000 and/or ETABS) for the analysis of steel bridges. |

|           |                                                                                                                                                                                                                                                                                                                                                                |            |                                                                                                             |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------|
|           | measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                       |            |                                                                                                             |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO8</b> | Design structural girders and their connections that are integrated parts of the overall structural design. |
|           |                                                                                                                                                                                                                                                                                                                                                                | <b>LO9</b> | Produce design drawing necessary for cost estimation.                                                       |

#### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    |                      | ✓                      |            |                       | ✓                  |            |                |            | ✓             |                    |                                          |              | ✓          |                 |

### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                                                 | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                                                                     |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to Steel Bridge Systems                                                                                                                                                                                                | 4                  | 2                                     | 1        | 1               |
| 2        | Live Loads (Lane & Truck Loading)<br>Presenting a simplified workshop on the basics of using Tekla Structures.                                                                                                                      | 4                  | 2                                     | 1        | 1               |
| 3        | Load Application<br>Assigning students to model a simple part of a steel project using Tekla.<br><br>The teaching assistant leads a workshop on design models or software such as Tekla and AutoCAD, focusing on practical aspects. | 4                  | 2                                     | 1        | 1               |
| 4        | Load Application                                                                                                                                                                                                                    | 4                  | 2                                     | 1        | 1               |
| 5        | Floor System Design (ECOP)                                                                                                                                                                                                          | 4                  | 2                                     | 1        | 1               |
| 6        | Floor System Design (ECOP)<br>Presenting examples of steel bridge projects implemented locally or globally                                                                                                                          | 4                  | 2                                     | 1        | 1               |
| 7        | <b>Revision and Mid Exam</b>                                                                                                                                                                                                        |                    |                                       |          |                 |
| 8        | Plate Girder Design (ECOP)                                                                                                                                                                                                          | 4                  | 2                                     | 1        | 1               |
| 9        | Plate Girder Design (ECOP)                                                                                                                                                                                                          | 4                  | 2                                     | 1        | 1               |
| 10       | Bracing Systems                                                                                                                                                                                                                     | 4                  | 2                                     | 1        | 1               |
| 11       | Design of beam connections, splices and stiffeners                                                                                                                                                                                  | 4                  | 2                                     | 1        | 1               |
| 12       | Bridge Bearings (Elastomeric Bearing Design, Roller) and details                                                                                                                                                                    | 4                  | 2                                     | 1        | 1               |
| 13       | Composite Plate girder (ECP)                                                                                                                                                                                                        | 4                  | 2                                     | 1        | 1               |
| 14       | Composite Plate girder (ECP)                                                                                                                                                                                                        | 4                  | 2                                     | 1        | 1               |
| 15,16    | <b>Final Exam.</b>                                                                                                                                                                                                                  |                    |                                       |          |                 |

**Experiment Topics: (If any)**

| Serial | Experiment                 |
|--------|----------------------------|
| 1      | Plate girder flexural test |
| 2      | Plate girder shear test    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *              | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-----------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work)    | 6                               | 5             | 5 %                              |
| 2   | Quiz 2 written (Semester work)    | 11                              | 10            | 10 %                             |
| 3   | Midterm exam                      | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                | 15, 16                          | 40            | 40 %                             |
| 5   | Final Practical + Oral discussion | 14                              | 5             | 5 %                              |
| 6   | Project                           | weekly                          | 20            | 20 %                             |

**6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Steel structures design, Prof. ABDELRAHIM KHALIL DESSOUKI, DAR ALMAARAF library, 12285, CAIRO, 2016.</li> <li>DESIGN AND ANALYSIS OF CONNECTIONS IN STEEL, ALFREDO BORAC, WILEY, 12286, GERMANY, 2018.</li> <li>STRUCTURAL STEEL WORK, SUDERSHAN KUMAR, VENUS BOOK, INDIA, 2023.</li> </ul>                                                                            |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>The Design Of Steel Bridges, K.C. Rocky, BOOK SOCIETY, 8891, LONDON, 1983.</li> <li>Steel Structures, Ch.G.Salam, S CHAND, 1229:1232, N.DELHI, 1980.</li> <li>Structural Steel Design, Abraham J.R., MCGRAW H., 1152, N.YORK, 1991.</li> <li>Behavior, Analysis And Design Of Steel Work V1,2 And 3, El-Sayed Bahaa Machaly, DAR ALKOTB, 8334, CAIRO, 2003.</li> </ul> |

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | <ul style="list-style-type: none"> <li>Steel Bridges, Metwaly Abu Hamd, GIZA, 2007.</li> <li>Egyptian Code Of Practice For Steel Construction And Bridges (Asd &amp; Lrfd), HOUSING AND BUILDING, DAR AL KOTB, 10321, CAIRO, 2001.</li> <li>Egyptian Loading Code, HOUSING AND BUILDING, DAR AL KOTB, CAIRO, 2012.</li> <li>Planning And Design of Bridges, M.S. Troitsky.</li> <li>Design of Highway Bridges, Richard M. Barker</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li><a href="https://structurae.net/en/structures/bridges/steel-bridges">https://structurae.net/en/structures/bridges/steel-bridges</a></li> <li><a href="https://www.steelconstruction.info/Bridges">https://www.steelconstruction.info/Bridges</a></li> <li>Journal of Bridge Engineering   ASCE Library</li> </ul>                                                                                    |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show, White Board                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | <b>Supplies</b>                                    | MS Team                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Other</b> (to be mentioned)                     | <a href="https://www.steelconstruction.info/Bridges">https://www.steelconstruction.info/Bridges</a>                                                                                                                                                                                                                                                                                                                                         |

|                  | <b>Course Coordinator</b>       | <b>Program Coordinator</b>       |
|------------------|---------------------------------|----------------------------------|
| <b>Name</b>      | <b>Dr. Mohammed Fathi Belal</b> | <b>Dr. Ghada Nashaat Mohamed</b> |
| <b>Signature</b> | M. Fathi Belal                  | غادة نشأت                        |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Highway and Airport Engineering</b>    |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 256</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Amr Nada                              |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Basic Design Control: Motion of Vehicles, Sight Distances, Alignment, Intersections. Earthwork: Soil Classification, Soil Stabilization, Flexible and Rigid Pavements, Highway Drain. Introduction to Airport Engineering.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><b>A2, A3, A4, A6, B1, B2</b> |                                                                                                                                                                                                                                                                                                                            | <b>Course Learning Outcomes</b> |                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Code</b>                                                                                                       | <b>Text</b>                                                                                                                                                                                                                                                                                                                | <b>Code</b>                     | <b>Text</b>                                                                                                                    |
| <b>A2</b>                                                                                                         | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                          | <b>LO1</b>                      | Evaluate the sight distance, horizontal alignment, vertical alignment, and intersections design.                               |
|                                                                                                                   |                                                                                                                                                                                                                                                                                                                            | <b>LO2</b>                      | Evaluate the soil classification, material strength, pavement response under loads, and structural design of flexible pavement |
| <b>A3</b>                                                                                                         | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.        | <b>LO3</b>                      | Conduct the appropriate horizontal alignment according to the standard specifications                                          |
| <b>A4</b>                                                                                                         | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                               | <b>LO4</b>                      | Utilize code practices and standard to design pavement responses under the loads                                               |
| <b>A6</b>                                                                                                         | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                   | <b>LO5</b>                      | Plan the data required for design of flexible pavement                                                                         |
| <b>B1</b>                                                                                                         | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and | <b>LO6</b>                      | Select the stopping and sight distance on highways                                                                             |



|           |                                                                                                                                                                                                                                                                                                                   |            |                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------|
|           | Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                                                                                                                  |            |                                                                 |
| <b>B2</b> | Achieve an optimum design of pavement and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO7</b> | Achieve optimum design OF flexible pavement and rigid pavement. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                |            | √             |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)        | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                            |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                            |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to Geometric and Structural Design of Highway | 3                  | 2                                     | 1        | 0               |
| 2        | Sight Distance                                             | 3                  | 2                                     | 1        | 0               |

|       |                                                      |   |   |   |   |
|-------|------------------------------------------------------|---|---|---|---|
| 3     | Horizontal Alignment                                 | 3 | 2 | 1 | 0 |
| 4     | Sight Distance at Horizontal Alignment               | 3 | 2 | 1 | 0 |
| 5     | Vertical curves                                      | 3 | 2 | 1 | 0 |
| 6     | Design of Intersection                               | 3 | 2 | 1 | 0 |
| 7     | <b>Revision and Mid Exam</b>                         |   |   |   |   |
| 8     | Sight Distance at Intersection                       | 3 | 2 | 1 | 0 |
| 9     | Soil Classification                                  | 3 | 2 | 1 | 0 |
| 10    | Soil Strength and Soil Stabilization                 | 3 | 2 | 1 | 0 |
| 11    | Specifications o Road Layers or Structural Design    | 3 | 2 | 1 | 0 |
| 12    | Pavement Response under Load (Stress and Deflection) | 3 | 2 | 1 | 0 |
| 13    | Design of Flexible Pavement                          | 3 | 2 | 1 | 0 |
| 14    | Asphalt Materials and Design of Hot Asphalt Mixtures | 3 | 2 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                                   |   |   |   |   |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | <b>5</b>                        | <b>10</b>     | <b>10 %</b>                      |
| 2   | Exam 2 written (Semester work) | <b>10</b>                       | <b>10</b>     | <b>10 %</b>                      |
| 3   | Midterm exam                   | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 4   | Final Written Exam             | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 5   | Tutorial and report assessment | <b>6 &amp;14</b>                | <b>20</b>     | <b>20 %</b>                      |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• Geotechnics of Roads :Fundamentals, Bernardo Caice, CRC PRESS, 12159 &amp; 12290, LONDON, 2019.</li> <li>• Highway Engineering Volume 1 and Volume 2, Gerber.</li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• هندسة الطرق والمطارات د. سامي غازي</li> <li>• Transportation Engineering BEVERLY, T.KUHN, 12309, (2019).</li> <li>• Lecture notes</li> </ul>                             |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                            |
|                                                                          | <b>Supplies</b>                                                                                                     | MS Team                                                                                                                                                                                                           |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                |

|                  | <b>Course Coordinator</b>      | <b>Program Coordinator</b>       |
|------------------|--------------------------------|----------------------------------|
| <b>Name</b>      | <b>Dr. Amr Abd Elaziz Nada</b> | <b>Dr. Ghada Nashaat Mohamed</b> |
| <b>Signature</b> | د/ عمرو عبد العزيز ندا         | غادة نشأت                        |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Advanced Strength of Materials</b>     |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 341</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Sherif H. AL-Tersawy                |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Stress strain relationship, unsymmetrical bending, prismatic and unprismatic members, curved beams, torsion bars of non circular section, elastic buckling of bars, beams on elastic foundations, theories of failure.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                          | Course Learning Outcomes                                    |                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A2, A4, A9, B1, B3                                                        |                                                                                                                                                                                                                          | Upon completion of the course, the student will be able to: |                                                                                                                                                                                                                    |
| Code                                                                      | Text                                                                                                                                                                                                                     | Code                                                        | Text                                                                                                                                                                                                               |
| A2                                                                        | Develop and conduct appropriate experimentation, analyze and interpret data, assess and evaluate findings, and engineering judgment to draw conclusions.                                                                 | LO1                                                         | Develop a deep understanding of stress-strain relationships of materials.                                                                                                                                          |
|                                                                           |                                                                                                                                                                                                                          | LO2                                                         | Conduct solutions for problems related to choosing adequate materials from mechanical and physical points of view.                                                                                                 |
|                                                                           |                                                                                                                                                                                                                          | LO3                                                         | Conduct advanced laboratory testing for materials and structural elements considering bending, torsion, and compression.                                                                                           |
|                                                                           |                                                                                                                                                                                                                          | LO4                                                         | Analyze and interpret data from testing process.                                                                                                                                                                   |
|                                                                           |                                                                                                                                                                                                                          | LO5                                                         | Use objective engineering judgement to draw conclusions considering materials properties.                                                                                                                          |
| A4                                                                        | Utilize engineering technologies, codes of practice and standards, quality guidelines, health and safety requirements.                                                                                                   | LO6                                                         | Utilize codes, and standards in the choice of materials according to its intended usage under unsymmetrical bending, and torsion.                                                                                  |
| A9                                                                        | Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                            | LO7                                                         | Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations during and after choosing materials for special structural elements. |
| B1                                                                        | Select appropriate and sustainable technologies for choosing materials; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques. | LO8                                                         | Use data from testing of materials as a requirement of selection in structural members for construction.                                                                                                           |

|    |                                                                                                       |     |                                                                                                                                                  |
|----|-------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------|
| B3 | Plan and manage construction processes; address construction defects, instability and quality issues. | LO9 | Manage and plan the construction process according to the required materials type and quality and according to the expected patterns of failure. |
|----|-------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)            | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                |                    |                                       | Tutorial | Practical / Lab |
| 1        | Stress- Strain relations for construction materials            | 3                  | 2                                     | 1        | 0               |
| 2        | Stress- Strain relations for construction materials (continue) | 3                  | 2                                     | 1        | 0               |
| 3        | Unsymmetrical bending for prismatic and non-prismatic members  | 3                  | 2                                     | 1        | 0               |
| 4        | Behavior and analysis of curved beams                          | 3                  | 2                                     | 1        | 0               |
| 5        | Behavior and analysis of curved beams (continue)+ quiz 1       | 3                  | 2                                     | 1        | 0               |

|       |                                                     |   |   |   |   |
|-------|-----------------------------------------------------|---|---|---|---|
| 6     | Torsion of bars of non-circular sections            | 3 | 2 | 1 | 0 |
| 7     | <b>Revision and Mid Exam</b>                        |   |   |   |   |
| 8     | Torsion of bars of non-circular sections (continue) | 3 | 2 | 1 | 0 |
| 9     | Elastic Buckling                                    | 3 | 2 | 1 | 0 |
| 10    | Elastic Buckling (continue) + quiz 2                | 3 | 2 | 1 | 0 |
| 11    | Beams on Elastic Foundation                         | 3 | 2 | 1 | 0 |
| 12    | Beams on Elastic Foundation (continue)              | 3 | 2 | 1 | 0 |
| 13    | Theories of Failure                                 | 3 | 2 | 1 | 0 |
| 14    | Theories of Failure                                 | 3 | 2 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                                  |   |   |   |   |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *                       | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | quiz 1 written (Semester work)             | 5                               | 10            | 10 %                             |
| 2   | quiz 2 written (Semester work)             | 10                              | 10            | 10%                              |
| 3   | Midterm exam                               | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                         | 14                              | 40            | 40 %                             |
| 5   | Tutorial and report assessment (Term Work) | weekly                          | 20            | 20%                              |

### **6- Learning Resources and Supportive Facilities \***

|                                   |                                                                             |                                                                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books,</b> | <b>The main (essential) reference (must be written in full according to</b> | <ul style="list-style-type: none"> <li>R.S.KHURMI, „ Engineering Mechanics and Strength at Materials“, 5965, <b>2018</b></li> </ul> |
|-----------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>scientific references, etc.) *</b>                                    | the scientific documentation method)               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                          | <b>Other References</b>                            | <ul style="list-style-type: none"> <li>Mechanical Behavior of Materials, Norman E. Dowling, International Edition</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <a href="https://www.scribd.com/document/334600312/%D9%83%D8%AA%D8%A7%D8%A8-%D8%AE%D9%88%D8%A7%D8%B5-%D8%A7%D9%84%D9%85%D9%88%D8%A7%D8%AF-%D9%88%D8%A7%D8%AE%D8%AA%D8%A8%D8%A7%D8%B1%D8%A7%D8%AA%D9%87%D8%A7-%D8%A7%D9%84%D8%AC%D8%B2%D8%A1-%D8%A7%D9%84%D8%A7%D9%88%D9%84">https://www.scribd.com/document/334600312/%D9%83%D8%AA%D8%A7%D8%A8-%D8%AE%D9%88%D8%A7%D8%B5-%D8%A7%D9%84%D9%85%D9%88%D8%A7%D8%AF-%D9%88%D8%A7%D8%AE%D8%AA%D8%A8%D8%A7%D8%B1%D8%A7%D8%AA%D9%87%D8%A7-%D8%A7%D9%84%D8%AC%D8%B2%D8%A1-%D8%A7%D9%84%D8%A7%D9%88%D9%84</a> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data show                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Supplies</b>                                    | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Skill Labs/Simulators</b>                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                          | <b>Other (to be mentioned)</b>                     | --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | Prof. Sherif H. AL-Tersawy                                                          | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                                        |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Computer Applications in Structural Engineering</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 345</b>                                         |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                      |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                                     | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                      | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                               |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                        |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                      |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>                  |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan                         |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department              |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                                     |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Development and implementation of computer programs in Fortran, Basic and Spreadsheets in the area of stress-strain analysis, matrix structural analysis, numerical methods, design process of reinforced concrete and steel members, and concrete mix-design and quality control.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                     |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A3, A4, A6, B1, B2</b>                                                        |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                     |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                         |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                          | <b>LO1</b>                                                         | Construct the student analysis, problem identification, capability of creative thinking and obtaining solutions to Carry out modeling of different types of complicated structures. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>LO2</b>                                                         | Use mathematical, and theories formulae to Analyze for system elements by using sap 2000 application.                                                                               |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                 | <b>LO3</b>                                                         | Apply the different solutions of expected and unexpected technical problems related to annotated topics.                                                                            |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.                                                                                                                                                                                                                                                                                     | <b>LO4</b>                                                         | Design and engineering sense. Structural-design application sense                                                                                                                   |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Define the different modeling types.                                                                                                                                                |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbours; or any other emerging field relevant to the discipline.                                              | <b>LO6</b>                                                         | Design of reinforced concrete or steel structures.                                                                                                                                  |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      | √          | √                     | √                  | √          |                |            | √             | √                  | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                           | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                               |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                               |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to finite element method, types of structural elements.                                                          | 3                  | 2                                     | 1        | ---             |
| 2        | Introduction of SAP 2000 program: definition of material properties, section properties, load cases, and boundary conditions. | 3                  | 2                                     | 1        | ---             |
| 3        | Modeling and analysis of beams by using SAP program                                                                           | 3                  | 2                                     | 1        | ---             |
| 4        | Modeling and analysis of frames by using SAP program                                                                          | 3                  | 2                                     | 1        | ---             |
| 5        | Modeling and analysis of trusses by using SAP program.                                                                        | 3                  | 2                                     | 1        | ---             |
| 6        | Introduction to finite element method, types of structural elements.                                                          | 3                  | 2                                     | 1        | ---             |
| 7        | Revision and Mid Exam                                                                                                         |                    |                                       |          |                 |
| 8        | Statical system and construct DXF file                                                                                        | 3                  | 2                                     | 1        | ---             |

|       |                                                                          |   |   |   |     |
|-------|--------------------------------------------------------------------------|---|---|---|-----|
| 9     | Normal stress distribution in beams of different shapes.                 | 3 | 2 | 1 | --- |
| 10    | Special cases of Normal stress distribution in beams.                    | 3 | 2 | 1 | --- |
| 11    | shear stress distribution in beams of different shapes                   | 3 | 2 | 1 | --- |
| 12    | Special cases of shear stress distribution in beams.                     | 3 | 2 | 1 | --- |
| 13    | Transformation of stress and strain, Mohr's circle                       | 3 | 2 | 1 | --- |
| 14    | Spherical and cylindrical pressure vessels. Elastic buckling of columns. | 3 | 2 | 1 | --- |
| 15,16 | <b>Final Exam.</b>                                                       |   |   |   |     |

#### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing<br>(Week Number) | Marks/<br>Scores | Percentage of<br>total course<br>Marks |
|-----|--------------------------------|------------------------------------|------------------|----------------------------------------|
| 1   | Exam 1 written (Semester work) | <b>4</b>                           | <b>5</b>         | <b>5%</b>                              |
| 2   | Exam 2 written (Semester work) | <b>11</b>                          | <b>5</b>         | <b>5%</b>                              |
| 3   | Midterm exam                   | <b>7</b>                           | <b>20</b>        | <b>20%</b>                             |
| 4   | Final Written Exam             | <b>15, 16</b>                      | <b>40</b>        | <b>40 %</b>                            |
| 6   | Report                         | <b>14</b>                          | <b>15</b>        | <b>15%</b>                             |
| 7   | Course Work                    | <b>Periodically</b>                | <b>15</b>        | <b>15%</b>                             |

#### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <p><b>McGuire, W., Gallagher, R. H., &amp; Ziemian, R. D. (2015).</b> Matrix Structural Analysis. Createspace Independent Publishing Platform, ISBN 81507585139</p> <p><b>Beil, J. (2023).</b> Finite Elements in Civil Engineering Applications. CWILLFORD PRESS.</p>                                                             |
|                                                                  | <b>Other References</b>                                                                                             | <b>Lecture notes, PDF</b>                                                                                                                                                                                                                                                                                                          |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>• <a href="http://www.experiencefestival.com/structural_analysis_-_mechanics_of_materials_methods">http://www.experiencefestival.com/structural_analysis_-_mechanics_of_materials_methods</a></li> <li>• <a href="https://ww2.mathworks.cn/en/">https://ww2.mathworks.cn/en/</a></li> </ul> |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | Microsoft office                                                                                                                                                                                                                                                                                                                   |

|                                                                          |                                |                 |
|--------------------------------------------------------------------------|--------------------------------|-----------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>     | --              |
|                                                                          | <b>Supplies</b>                |                 |
|                                                                          | <b>Electronic Programs</b>     | Microsoft Teams |
|                                                                          | <b>Skill Labs/ Simulators</b>  | --              |
|                                                                          | <b>Virtual Labs</b>            | --              |
|                                                                          | <b>Other (to be mentioned)</b> | --              |

|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Morcos Farid Samaan</b>                                             | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Plastic Structural Analysis</b>        |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 347</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Plastic hinge and plastic collapse concepts; plastic moment of resistance. Basic theorems. Plastic collapse loads of beams and portal frames. Effect of normal and shear forces. Load-displacement relationship. Plastic design.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                              | Course Learning Outcomes                                    |                                                                                                                            |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| A2, A8, B1                                                                |                                                                                                                                                                                                                                                                                                                                                                                                              | Upon completion of the course, the student will be able to: |                                                                                                                            |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                         | Code                                                        | Text                                                                                                                       |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                            | LO1                                                         | Analyze the principals to calculate plastic capacities of different structural elements.                                   |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                              | LO2                                                         | Developing of plastic mechanisms for beams 2D portal frames.                                                               |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                              | LO3                                                         | Evaluate the yield line mechanism of concrete slabs                                                                        |
| A8                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                                                                                                                                                                                                                                                                                         | LO4                                                         | Discuss the mini-project output in front of the judging committee established from the course teachers and other students. |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO5                                                         | Able to select the suitable solving technique whether manual or using computer to solve plastic problems.                  |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      | √          | √                     | √                  | √          |                |            | √             | √                  | √                                        |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                           | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                               |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                               |                    |                                       | Tutorial | Practical / Lab |
| 1        | Review on elastic concepts in the analysis of framed structures.              | 3                  | 2                                     | 1        | --              |
| 2        | Ductility and plastic hinge concept in reinforced concrete beams and columns. | 3                  | 2                                     | 1        | --              |
| 3        | Moment-curvature relationships.                                               | 3                  | 2                                     | 1        | --              |
| 4        | Influence of axial force and confining reinforcement.                         | 3                  | 2                                     | 1        | --              |
| 5        | Plastic hinge length and rotation capacity.                                   | 3                  | 2                                     | 1        | --              |
| 6        | Plastic collapse of frames under static loading.                              | 3                  | 2                                     | 1        | --              |
| 7        | Revision and Mid Exam                                                         |                    |                                       |          |                 |
| 8        | Collapse mechanisms and plastic limit load.                                   | 3                  | 2                                     | 1        | --              |
| 9        | The mechanism method of plastic limit analysis.                               | 3                  | 2                                     | 1        | --              |



|       |                                                                               |   |   |   |    |
|-------|-------------------------------------------------------------------------------|---|---|---|----|
| 10    | Linear program for identifying the critical mechanism and plastic limit load. | 3 | 2 | 1 | -- |
| 11    | The equilibrium method of plastic limit analysis.                             | 3 | 2 | 1 | -- |
| 12    | The yield line collapse load of reinforced concrete slabs.                    | 3 | 2 | 1 | -- |
| 13    | Computer method to solve plastic problems.                                    | 3 | 2 | 1 | -- |
| 14    | Introduction to push-over analysis.                                           | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                            |   |   |   |    |

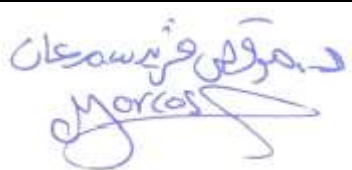
### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing<br>(Week Number) | Marks/<br>Scores | Percentage of<br>total course<br>Marks |
|-----|--------------------------------|------------------------------------|------------------|----------------------------------------|
| 1   | Exam 1 written (Semester work) | 4                                  | 5                | 5%                                     |
| 2   | Exam 2 written (Semester work) | 11                                 | 5                | 5%                                     |
| 3   | Midterm exam                   | 7                                  | 20               | 20%                                    |
| 4   | Final Written Exam             | 15, 16                             | 40               | 40 %                                   |
| 6   | Report                         | 14                                 | 15               | 15%                                    |
| 7   | Course Work                    | Periodically                       | 15               | 15%                                    |

### **6- Learning Resources and Supportive Facilities \***

|                                                                      |                                                                                                                     |                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources<br/>(books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | Nielsen, M. P., & Hoang, L. C. (2010). <i>Limit Analysis and Concrete Plasticity</i> (2nd ed.). Boca Raton, FL: CRC Press / Taylor & Francis Group.<br><br>Beil, J. (2023). <i>Finite Elements in Civil Engineering Applications</i> . CWILLFORD PRESS.                      |
|                                                                      | <b>Other References</b>                                                                                             | <b>Lecture notes, PDF</b>                                                                                                                                                                                                                                                    |
|                                                                      | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://courses.structure.education/collections">https://courses.structure.education/collections</a><br><a href="https://www.aboutcivil.org/plastic-analysis-definition-principles.html">https://www.aboutcivil.org/plastic-analysis-definition-principles.html</a> |
|                                                                      | <b>Learning Platforms</b><br>(Links must be added)                                                                  | Microsoft office                                                                                                                                                                                                                                                             |
| <b>Supportive facilities &amp; equipment</b>                         | <b>Devices/Instruments</b>                                                                                          | --                                                                                                                                                                                                                                                                           |
|                                                                      | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                                                           |
|                                                                      | <b>Electronic Programs</b>                                                                                          | Microsoft Teams                                                                                                                                                                                                                                                              |

|                             |                         |    |
|-----------------------------|-------------------------|----|
| for teaching and learning * | Skill Labs/ Simulators  | -- |
|                             | Virtual Labs            | -- |
|                             | Other (to be mentioned) | -- |

|           | Course Coordinator                                                                | Program Coordinator                                                                |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Name      | Ass. Prof. Morcos Farid Samaan                                                    | Dr. Ghada Nashaat Mohamed                                                          |
| Signature |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                               |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Selected Topics in Structural Analysis</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 349</b>                                |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                             |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                            | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                             | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                      |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                               |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                             |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>         |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Ass. Prof. Morcos Farid Samaan                |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department     |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                            |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Selected topics from the following: analysis of space structures, soil structures interaction, finite element methods, finite strip methods, elastic plastic analysis, and analysis of structures subjected to cyclic and dynamic loading, analysis of multistory buildings, boundary elements method.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                              |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>A2, A9, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                              |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                  |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Knowledge of the basis of finite element modeling.                                                           |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Knowledge of different types of modeling elements                                                            |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | Understanding the major differences between modeling elements.                                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO4</b>                                                         | Evaluate and analyze obtained results both from computer or using classical theories of structural analysis. |
| <b>A9</b>                                                                        | Use creative innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                                | <b>LO5</b>                                                         | Using obtained analysis results from the computer model as a quantitative structural design inputs.          |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO6</b>                                                         | Judge on the safety of structure                                                                             |

### **4. Course Teaching and Learning Methods:**

| <b>Direct Instruction</b> | <b>Indirect Instruction</b> | <b>Information Technology-Assisted Learning</b> |
|---------------------------|-----------------------------|-------------------------------------------------|
|---------------------------|-----------------------------|-------------------------------------------------|

| Lectures | Tutorial / Practical | Brain Storming | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs | Virtual labs | E-Learning | AI in Education |
|----------|----------------------|----------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|---------------------|--------------|------------|-----------------|
| √        | √                    |                |                        |            | √                     | √                  |            |                |            | √             |                    |                     |              |            |                 |

### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                              | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                  |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                  |                    |                                       | Tutorial | Practical / Lab |
| 1        | Revision for the classical structural analysis theories.                                                         | 3                  | 2                                     | 1        | ----            |
| 2        | Introduction to finite element method, types of structural elements.                                             | 3                  | 2                                     | 1        | ----            |
| 3        | SAP2000 environment, definition of material properties, section properties, load cases, and boundary conditions. | 3                  | 2                                     | 1        | ----            |
| 4        | Modeling of Beams and Frames.                                                                                    | 3                  | 2                                     | 1        | ----            |
| 5        | Modeling of Trusses.                                                                                             | 3                  | 2                                     | 1        | ----            |
| 6        | Modeling of shell elements.                                                                                      | 3                  | 2                                     | 1        | ----            |
| 7        | <b>Revision and Mid Exam</b>                                                                                     |                    |                                       |          |                 |
| 8        | Application: Analysis of a complicated slab and beam type roof including a RC stair.                             | 3                  | 2                                     | 1        | ----            |
| 9        | Application: Analysis and design of a flat slab type roof, and extending the application to the RC mats.         | 3                  | 2                                     | 1        | ----            |

|       |                                                                                                                |   |   |   |      |
|-------|----------------------------------------------------------------------------------------------------------------|---|---|---|------|
| 10    | Introduction to seismicity and analysis of earthquake resisting structures using classical theories.           | 3 | 2 | 1 | ---- |
| 11    | Application: Analysis of a complete high rise structure, including its beams, flat slab roofs, stairs, column. | 3 | 2 | 1 | ---- |
| 12    | Application: Analysis and design of raft foundations.                                                          | 3 | 2 | 1 | ---- |
| 13    | Application: Analysis and design of raft foundations.                                                          | 3 | 2 | 1 | ---- |
| 14    | Revision                                                                                                       | 3 | 2 | 1 | ---- |
| 15,16 | <b>Final Exam.</b>                                                                                             |   |   |   |      |

### **5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work) | 3                               | 10            | 10 %                             |
| 2   | Quiz 2 written (Semester work) | 10                              | 10            | 10 %                             |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project          | weekly                          | 20            | 20 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                           |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li><b>Beil, J. (2023).</b> Finite Elements in Civil Engineering Applications. CWILLFORD PRESS.</li> </ul>                                                                                             |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>THEORY OF STRUCTURES, WAGIH MOHAMED, DAR AL KOTB, CAIRO, 2000, Civil Engineering Department Library, H.T.I. of 10th of Ramadan, (1215)</li> </ul>                                                  |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="http://www.experiencefestival.com/structural_analysis_mechanics_of_materials_methods">http://www.experiencefestival.com/structural_analysis_mechanics_of_materials_methods</a></li> </ul> |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                    |
|                                                                  | <b>Devices/Instruments</b>                                                                                          | <b>Computer Lab</b>                                                                                                                                                                                                                       |

|                                                                          |                                |                 |
|--------------------------------------------------------------------------|--------------------------------|-----------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Supplies</b>                | --              |
|                                                                          | <b>Electronic Programs</b>     | <b>SAP 2000</b> |
|                                                                          | <b>Skill Labs/ Simulators</b>  | --              |
|                                                                          | <b>Virtual Labs</b>            | --              |
|                                                                          | <b>Other (to be mentioned)</b> | --              |

|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                          |
|------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Ass. Prof. Morcos Farid Samaan</b>                                             | <b>Dr. Ghada Nashaat Mohamed</b>                                                    |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Prestressed Concrete</b>               |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 351</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Birth of Prestressing: Concepts, Methods, Materials, and Stresses. Losses. Analysis of Section simple Slabs and Beams for Flexure, Shear and Bond; End Zone and Anchor Zone Stresses. End Block Design continuity, cap coupling cable profile, tanks design of poles, piles, columns.



### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                    |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>A3, A4, B1, B2</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                    |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                        |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                                                         | Identify the concrete properties of flexure, shear members to solve engineering-based design problems by applying design formulas. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Conduct design parameters of flexure, shear and normal members.                                                                    |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | Employ the Egyptian code in design of pre-stressed members.                                                                        |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.contexts of sustainable design and development                                                                                                                                                                                  | <b>LO4</b>                                                         | Utilize code practices and standard to design appropriate specials slabs system and beams.                                         |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Calculate the axial loads acting on sections.                                                                                      |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO6</b>                                                         | Utilize the Egyptian code in the design and construction of pre-stressed concrete structures                                       |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO7</b>                                                         | Select the appropriate structure system.                                                                                           |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and                                                                                                                                                                                                                                                                                                                      | <b>LO8</b>                                                         | Achieve optimum design of special pre-stressed slab-system and flexure, shear members.                                             |

|  |                                                                                                                                                                                                                                                                          |            |                                                                                                      |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------|
|  | Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources, and Harbors; or any other emerging field relevant to the discipline. | <b>Lo9</b> | Analyze the shear and torsion strength of concrete and the safe design of pre-stressed beam element. |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------|

#### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### **Course Schedule:**

| Week No. | Topic                                                                                                                                                                                                                              | Total Hours | Contact hrs |      |      |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|------|------|
|          |                                                                                                                                                                                                                                    |             | Lec.        | Tut. | Lab. |
| Week - 1 | Introduction, different methods to obtain pre-stressed concrete (mechanical method, chemical method, electrical method), types of pre-stressed concrete (linear or circular, internal or external, full or partial) pre-stressing. | 3           | 2           | 1    | --   |
| Week-2   | Losses of pre-stressing force: initial losses (elastic shortening of concrete, anchorage slippage of cables, and friction), final losses (shrinkage, creep of concrete and relaxation of steel).                                   | 3           | 2           | 1    | --   |
| Week-3   | Distribution of stresses along beam length in transfer and final stages.                                                                                                                                                           | 3           | 2           | 1    | --   |

|            |                                                                                                                                           |   |   |   |    |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| Week-4     | Cable path, Beams with cantilevers (cases of max. +ve B. M., max. -ve B. M., and absolute B. M.).                                         | 3 | 2 | 1 | -- |
| Week-5     | Design of pre-stressed concrete sections using LEONHRDT curves (for symmetrical & unsymmetrical sections [R, box, I, U, and T sections]). | 3 | 2 | 1 | -- |
| Week-6     | Design of end blocks (in elevation and in plan), equivalent load due to pre-stressing.                                                    | 3 | 2 | 1 | -- |
| Week-7     | <b>Revision and Midterm Exam.</b>                                                                                                         |   |   |   |    |
| Week-8     | Check for ultimate loads: check for ultimate moment.                                                                                      | 3 | 2 | 1 | -- |
| Week-9     | Check for ultimate loads: check for web shear and flexure shear.                                                                          | 3 | 2 | 1 | -- |
| Week-10    | Pre-stressed continuous beams: primary moments, secondary moments, final moments, equivalent load due to pre-stressing force.             | 3 | 2 | 1 | -- |
| Week-11    | Pre-stressed continuous beams: Linear transportation of cables, T-line and C-line.                                                        | 3 | 2 | 1 | -- |
| Week-12    | Prestressed continuous beams: Check for web shear and flexure shear.                                                                      | 3 | 2 | 1 | -- |
| Week-13    | Pre-stressed cantilever beams                                                                                                             | 3 | 2 | 1 | -- |
| Week-14    | Pre-stressed cantilever beams: Check for web shear and flexure shear                                                                      | 3 | 2 | 1 | -- |
| Week 15,16 | <b>Final Exam.</b>                                                                                                                        |   |   |   |    |

### **5- Methods of students' assessment:**

| No. | Assessment Methods * | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|----------------------|---------------------------------|---------------|----------------------------------|
| 1   | Research Report      | 1,2                             | 10            | 10%                              |
| 3   | Midterm exam         | 7                               | 20            | 20 %                             |
| 4   | Project              | 5,8,10,12                       | 30            | 30%                              |
| 5   | Final Written Exam   | 15, 16                          | 40            | 40 %                             |

### **6- Learning Resources and Supportive Facilities \***

|                                   |                                                                                                                     |                                                                                                   |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Learning resources (books,</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>DESIGN OF CONCRETE STRUCTURES DAVID DARWIN 2016</li> </ul> |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|

|                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>scientific references, etc.) *</b>                                    |                                                    | <ul style="list-style-type: none"> <li>• Design of reinforced concrete structures: Dr. M. Goneem <b>2019</b></li> <li>• Design and construction of reinforced concrete structures ECP-203-2018</li> <li>• Loads applied on building ECP-208</li> </ul>                                                                                                                                                                                                                        |
|                                                                          | <b>Other References</b>                            | <ul style="list-style-type: none"> <li>• ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>• ASCE: American society of civil Engineering.</li> <li>• BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                                                                  |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added) | <ul style="list-style-type: none"> <li>• <a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html</a></li> <li>• <a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li>• <a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Supplies</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Electronic Programs</b>                         | AutoCAD program<br>CSI programs (SAP)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Skill Labs/ Simulators</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Virtual Labs</b>                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Prof. Essam Khalifa</b>                                                          | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | Advanced Reinforced concrete              |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 353</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Design of members subjected to axial loads and biaxial bending, deep flexural members, brackets and corbels. Design for torsion. Design of retaining walls: basement walls, load bearing walls, and shear walls. Yield line analysis of slabs.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                              | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                   |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A3, A4, B1, B2</b>                                                            |                                                                                                                                                                                                                                                                                                                                                              | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                   |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                  | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                       |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                          | <b>LO1</b>                                                         | Identify the concrete properties of flexure, torsion members to solve engineering-based design problems by applying design formulas.                              |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                              | <b>LO2</b>                                                         | Conduct design parameters of flexure, torsion, shear and normal members.                                                                                          |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                              | <b>LO3</b>                                                         | Employ the different codes in design of flexure, torsion, shear and normal members.                                                                               |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                 | <b>LO4</b>                                                         | Utilize codes of practice for the choice of type of foundation according to loads and soil type also code of design and implementation of concrete constructions. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                              | <b>LO5</b>                                                         | Utilize quality and architectural guidelines for the choice of stairs according to materials and available areas.                                                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                              | <b>LO6</b>                                                         | Apply design process of reinforced concrete flat and hollow block slabs system to produce cost-effective design.                                                  |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                              | <b>LO7</b>                                                         | Utilize code practices and standard to design appropriate specials slabs system, column and stairs.                                                               |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, | <b>LO8</b>                                                         | Calculate the axial loads acting on columns.                                                                                                                      |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                              | <b>LO9</b>                                                         | Utilize the Egyptian code in design and construction of reinforced concrete structures.                                                                           |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                              | <b>LO10</b>                                                        | Select appropriate structure system.                                                                                                                              |

|           |                                                                                                                                                                                                                                                                                                                                                                |             |                                                                                             |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------|
|           | Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                                                                                                                                                                                                 |             |                                                                                             |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO11</b> | Achieve optimum design of special Shear friction, brackets, corbels and beam ledges.        |
|           |                                                                                                                                                                                                                                                                                                                                                                | <b>LO12</b> | Analyse flexure and axial load, design for biaxial loading, design for slenderness effects. |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brainstorming        | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                             | Total Weekly Hours | Expected number of the Learning Hours |          |                |
|----------|-------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|----------------|
|          |                                                                                                 |                    | Theoretical teaching<br>(lectures)    | Training |                |
|          |                                                                                                 |                    |                                       | Tutorial | Practical /Lab |
| 1        | Introduction, scope, philosophy of codes, general requirements, materials and concrete quality. | 3                  | 2                                     | 1        | --             |

|       |                                                                                                                                                      |   |   |   |    |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| 2     | Details of reinforcement, development and splices of reinforcement, design methods and strength requirements, general principles of strength design. | 3 | 2 | 1 | -- |
| 3     | Distribution of flexural reinforcement, deflections, moment redistribution, design for flexure.                                                      | 3 | 2 | 1 | -- |
| 4     | Design for flexure and axial load, design for biaxial loading, design for slenderness effects.                                                       | 3 | 2 | 1 | -- |
| 5     | Design for shear and torsion.                                                                                                                        | 3 | 2 | 1 | -- |
| 6     | Shear friction, brackets, corbels and beam ledges                                                                                                    | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                         |   |   |   |    |
| 8     | Deep flexural members.                                                                                                                               | 3 | 2 | 1 | -- |
| 9     | Deep flexural members.                                                                                                                               | 3 | 2 | 1 | -- |
| 10    | Flat slabs: direct design method, equivalent frame method.                                                                                           | 3 | 2 | 1 | -- |
| 11    | Special provisions for seismic design                                                                                                                | 3 | 2 | 1 | -- |
| 12    | Pre-stressed concrete.                                                                                                                               | 3 | 2 | 1 | -- |
| 13    | Precast concrete.                                                                                                                                    | 3 | 2 | 1 | -- |
| 14    | Lateral loads on structures.                                                                                                                         | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                                                   |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Quiz 1 written (Semester work)            | 6                               | 10            | 10%                              |
| 2   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 3   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 4   | Assignments / Project /Portfolio/ Logbook | 5                               | 10            | 10%                              |
| 5   | Assignments / Project /Portfolio/ Logbook | 11                              | 10            | 10%                              |
| 6   | Report                                    | 14                              | 10            | 10%                              |



## **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Design and construction of reinforced concrete structures ECP-203-2018</li> <li>Design of reinforced concrete structures: Dr. M. Goneem 2019 Reinforced Concrete: Park and Puly</li> <li>Hilal, M. , Fundamentals of Reinforced and Prestressed Concrete</li> </ul>                                                                                                                                                              |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>Loads applied on building ECP-208</li> <li>ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>ASCE: American society of civil Engineering.</li> <li>BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                       |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html</a></li> <li><a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li><a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Supplies</b>                                                                                                     | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Electronic Programs</b>                                                                                          | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | ---                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|             |                            |                                  |
|-------------|----------------------------|----------------------------------|
|             | <b>Course Coordinator</b>  | <b>Program Coordinator</b>       |
| <b>Name</b> | <b>Prof. Essam Khalifa</b> | <b>Dr. Ghada Nashaat Mohamed</b> |

|                  |                                                                                   |           |
|------------------|-----------------------------------------------------------------------------------|-----------|
| <b>Signature</b> |  | غادة نجات |
|------------------|-----------------------------------------------------------------------------------|-----------|

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Bridge Engineering</b>                 |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 355</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Types and components of bridges. Loads on bridges. Fundamental behavior and practical design of shallow superstructures, with emphasis on slab-on-girder deck systems. Design of composite sections. Bridge substructures. Bridge rating. Use of relevant codes.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                 |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A3, A4, A10, B1, B2, B3</b>                                                   |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                 |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                     |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                                                         | Discover all the information on Types and components of bridges.                                                                                                |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Conduct analysis of bridges and evaluate the Loads on bridges.                                                                                                  |
| <b>A10</b>                                                                       | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.                                                                                                                                                                                                                                                                                                                 | <b>LO3</b>                                                         | Choose the suitable method to implement the Fundamental behavior and practical design of shallow superstructures, with emphasis on slab-on-girder deck systems. |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                                                         | Plan to use different use of relevant codes.                                                                                                                    |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil                                                                                                                                                                                                                                                | <b>LO5</b>                                                         | Use procedure of design of the composite sections.                                                                                                              |

|           |                                                                                                                                                                                                             |            |                                                           |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------|
|           | engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources, and Harbors; or any other emerging field relevant to the discipline.          |            |                                                           |
| <b>B3</b> | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects. | <b>LO6</b> | Predict the required design section using relevant codes. |
|           |                                                                                                                                                                                                             | <b>LO7</b> | Determine the required bridge substructures.              |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    |                      | ✓                      |            | ✓                     | ✓                  |            |                |            | ✓             |                    |                                          |              | ✓          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics) |  | Expected number of the Learning Hours |
|----------|--------------------------------------------------|--|---------------------------------------|
|----------|--------------------------------------------------|--|---------------------------------------|

|       |                                                                                                                                                                                                    | <i>Total<br/>Weekly<br/>Hours</i> | <i>Theoretical<br/>teaching<br/>(lectures)</i> | <b>Training</b> |                    |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------|-----------------|--------------------|
|       |                                                                                                                                                                                                    |                                   |                                                | Tutorial        | Practical /<br>Lab |
| 1     | Types and components of bridges according to material (timber, R.C. , Prestressed concrete, steel, and cable stayed) bridges & according to function (foot, roadway, and road way) bridges.        | 3                                 | 2                                              | 1               | ---                |
| 2     | Types and components of bridges, Classification according to cross section type: slab type (solid, hollow core, and cellular) slabs, girder type (R.C. and Prestressed concrete), and box girders. | 3                                 | 2                                              | 1               | ---                |
| 3     | Statical system: Determinate (simple, floating bay, three hinged frame or arch).                                                                                                                   | 3                                 | 2                                              | 1               | ---                |
| 4     | Statical system: Indeterminate (continuous spans, frames, two hinged arch, cable stayed, and suspension) bridges.                                                                                  | 3                                 | 2                                              | 1               | ---                |
| 5     | Sub-structures: Piers [walls, columns (simple & multiple)] and abutments (solid walls, spill-through, and piles).                                                                                  | 3                                 | 2                                              | 1               | ---                |
| 6     | Determine the loads on bridges, superimposed loads) , live loads, breaking force, centrifugal force                                                                                                | 3                                 | 2                                              | 1               | ---                |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                       |                                   |                                                |                 |                    |
| 8     | Fundamental behavior and practical design of shallow superstructures                                                                                                                               | 3                                 | 2                                              | 1               | ---                |
| 9     | Discuss the types of slab-on-girder deck systems for bridge system                                                                                                                                 | 3                                 | 2                                              | 1               | ---                |
| 10    | Design of composite sections-P1                                                                                                                                                                    | 3                                 | 2                                              | 1               | ---                |
| 11    | Design of composite sections-P2                                                                                                                                                                    | 3                                 | 2                                              | 1               | ---                |
| 12    | Design of Bridge substructures components.                                                                                                                                                         | 3                                 | 2                                              | 1               | ---                |
| 13    | Use of relevant local codes.                                                                                                                                                                       | 3                                 | 2                                              | 1               | ---                |
| 14    | Use of relevant international codes.                                                                                                                                                               | 3                                 | 2                                              | 1               | ---                |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                 |                                   |                                                |                 |                    |

### 5- Methods of students' assessment:

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) Quiz1      | 6                               | 7.5           | 7.5%                             |
| 2   | Exam 2 written (Semester work) Quiz2      | 8                               | 7.5           | 7.5%                             |
| 3   | Presentation                              | 11                              | 10            | 10%                              |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15                              | 40            | 40 %                             |
| 7   | Assignments / Project /Portfolio/ Logbook | 6,11                            | 15            | 15%                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                           |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning resources (books, scientific references, etc.) * | The main (essential) reference (must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>DESIGN OF CONCRETE STRUCTURES DAVID DARWIN 2016</li> <li>Design of reinforced concrete structures: Dr. M. Goneem 2019</li> <li>Design and construction of reinforced concrete structures ECP-203-2018</li> <li>Loads applied on building ECP-208</li> </ul>                                                                                                                                                                      |
|                                                           | Other References                                                                                          | <ul style="list-style-type: none"> <li>ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>ASCE: American society of civil Engineering.</li> <li>BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                                                                  |
|                                                           | Electronic Sources (Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html</a></li> <li><a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li><a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |

|                                                                          |                                                    |                                |
|--------------------------------------------------------------------------|----------------------------------------------------|--------------------------------|
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office         |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Data Show                      |
|                                                                          | <b>Supplies</b>                                    | --                             |
|                                                                          | <b>Electronic Programs</b>                         | CSI programs (SAP), PowerPoint |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                             |
|                                                                          | <b>Virtual Labs</b>                                | --                             |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Prof. Essam Khalifa</b>                                                        | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                                  |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Quality Control of Construction Materials</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 357</b>                                   |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                               | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                         |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                  |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>            |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Sherif H. Al-Tersawy                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department        |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                               |                  |                        |              |

## 2. Course Overview (Brief summary of scientific content):

Construction material specifications and test procedures. Sampling methods, data collection, and statistical data distributions. Quality control charts. Development of quality assurance specifications and acceptance plans. Applications on field data.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                     | Course Learning Outcomes                                    |                                                                                                                                  |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| A2, A4, A9, B1, B3                                                        |                                                                                                                                                                                                                                                                                     | Upon completion of the course, the student will be able to: |                                                                                                                                  |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                | Code                                                        | Text                                                                                                                             |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation analyse and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions                                                                     | LO1                                                         | Conduct a comprehensive review of the specifications and test procedures.                                                        |
|                                                                           |                                                                                                                                                                                                                                                                                     | LO2                                                         | Develop a comprehensive review of the construction material specifications                                                       |
|                                                                           |                                                                                                                                                                                                                                                                                     | LO3                                                         | Conduct the basics required for quality control tests needed for construction material.                                          |
|                                                                           |                                                                                                                                                                                                                                                                                     | LO4                                                         | Choose the proper statistical distribution for the material under consideration                                                  |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines for quality control analysis.                                                                                                                                                                | LO5                                                         | Illustrates the four types of quality control process control, control charts, acceptance sampling, and product quality control. |
|                                                                           |                                                                                                                                                                                                                                                                                     | LO6                                                         | Develop Sampling methods, data collection                                                                                        |
| A9                                                                        | Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations                                                                                                                                        | LO7                                                         | Apply statistical analysis to field data.                                                                                        |
|                                                                           |                                                                                                                                                                                                                                                                                     | LO8                                                         | The design of computer programs for making statistical analysis and reliability calculations.                                    |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural | LO9                                                         | Study the principles of Quality Control and Quality Assurance                                                                    |

|           |                                                                                                                                                                                                                    |               |                                                                                         |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------|
|           | <b>Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.</b>                                                                                     |               |                                                                                         |
| <b>B3</b> | <b>Plan and manage construction processes, address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.</b> | <b>LO 10.</b> | <b>Study the different quality Control charts Certificates and technical approvals.</b> |

#### **4. Course Teaching and Learning Methods:**

| <b>Direct Instruction</b> |                 | <b>Indirect Instruction</b> |                               |                   |                              |                               |                   |                       |                   |                      |                           | <b>Information Technology-Assisted Learning</b> |                     |                       |                        |
|---------------------------|-----------------|-----------------------------|-------------------------------|-------------------|------------------------------|-------------------------------|-------------------|-----------------------|-------------------|----------------------|---------------------------|-------------------------------------------------|---------------------|-----------------------|------------------------|
| <b>Lectures</b>           | <b>Tutorial</b> | <b>Brain Storming</b>       | <b>Project based learning</b> | <b>Case Study</b> | <b>Problem Base Learning</b> | <b>Reports &amp; Research</b> | <b>Discussion</b> | <b>Field Training</b> | <b>Site Visit</b> | <b>Self-Learning</b> | <b>Discovery Learning</b> | <b>Simulation Programs</b>                      | <b>Virtual labs</b> | <b>Microsoft team</b> | <b>AI in Education</b> |
| √                         | √               |                             |                               |                   |                              | √                             | √                 |                       |                   |                      |                           | √                                               |                     | √                     |                        |

#### **Course Schedule:**

| <b>Week No.</b> | <b>Scientific content of the course (Course Topics)</b>                                 | <b>Total Weekly Hours</b> | <b>Expected number of the Learning Hours</b> |                 |                        |
|-----------------|-----------------------------------------------------------------------------------------|---------------------------|----------------------------------------------|-----------------|------------------------|
|                 |                                                                                         |                           | <b>Theoretical teaching (lectures)</b>       | <b>Training</b> |                        |
|                 |                                                                                         |                           |                                              | <b>Tutorial</b> | <b>Practical / Lab</b> |
| 1               | Identify an introduction about Construction material specifications and test procedures | 3                         | 2                                            | 1               | --                     |
| 2               | Specifications and test procedures                                                      | 3                         | 2                                            | 1               | --                     |

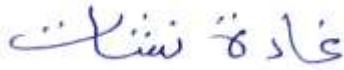
|       |                                                                                |   |   |   |    |
|-------|--------------------------------------------------------------------------------|---|---|---|----|
| 3     | Study of Construction material specifications and test procedures              | 3 | 2 | 1 | -- |
| 4     | Study of Sampling methods, data collection, and statistical data distributions | 3 | 2 | 1 | -- |
| 5     | Study of Sampling methods, data collection, and statistical data distributions | 3 | 2 | 1 | -- |
| 6     | Study of Sampling methods, data collection, and statistical data distributions | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                   |   |   |   |    |
| 8     | Illustrate Quality control charts                                              | 3 | 2 | 1 | -- |
| 9     | Illustrate Quality control charts                                              | 3 | 2 | 1 | -- |
| 10    | Monte Carlo simulation for measuring reliability                               | 3 | 2 | 1 | -- |
| 11    | Development for quality                                                        | 3 | 2 | 1 | -- |
| 12    | Application of field data                                                      | 3 | 2 | 1 | -- |
| 13    | Application of field data                                                      | 3 | 2 | 1 | -- |
| 14    | Revision                                                                       | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                             |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing<br>(Week Number) | Marks/<br>Scores | Percentage<br>of<br>total course<br>Marks |
|-----|--------------------------------|------------------------------------|------------------|-------------------------------------------|
| 1   | Exam 1 written (Semester work) | 4                                  | 10               | 10%                                       |
| 2   | Exam 2 written (Semester work) | 12                                 | 10               | 10%                                       |
| 3   | Midterm exam                   | 7                                  | 20               | 20 %                                      |
| 4   | Final Written Exam             | 15, 16                             | 40               | 40 %                                      |
| 5   | Assignment                     | ACORDING TO<br>SCADUOAL            | 10               | 10%                                       |
| 6   | Reports                        | 13                                 | 10               | 10%                                       |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                            |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>BASIC CIVIL ENGINEERING, B.C.PUNMIA, LAXMI PUBLICATI, INDIA, 2023</li> <li>الملحق الثالث للكود المصرى</li> </ul>                                                    |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>CIVIL ENGINEERING:BUILDING MATERIALS PROPERTI, CAYSON CARTER, MURPHY &amp; MOORE, NEW YORK, 2023 STRENGTH OF MATERIALS, S K DUGGAL , INDIA, NEW AGE,2024</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                         |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                     |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                     |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                         |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                         |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                         |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                         |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                         |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | Prof. Sherif H. Al-Tersawy                                                          | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Design of building systems</b>         |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 359</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Types, functions and components of building systems; idealization. Initiation of analysis-design process. Estimation of gravity, wind and earthquake loads. Load pattern combinations. Live load reduction. Force redistribution in R.C. buildings. Design and detailing requirements. Computer application. Group term project.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                 |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>A2, A4, A9, B1, B3</b>                                                        |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                 |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                     |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Discover all the information on Types, functions, and components of building systems.                           |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Conduct analysis of design process, Estimation of gravity, wind and earthquake loads, Load pattern combinations |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                                                                                                                | <b>LO3</b>                                                         | Choose the suitable method to Design and detailing requirements of building System.                             |
| <b>A9</b>                                                                        | Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                              | <b>LO4</b>                                                         | Plan to use Force redistribution in R.C building system.                                                        |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Use Computer application relevant to design buildings.                                                          |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO6</b>                                                         | Predict the required design section using relevant codes.                                                       |
| <b>B3</b>                                                                        | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.                                                                                                                                                                                                 | <b>LO7</b>                                                         | Determine Design and detailing requirements.                                                                    |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                              | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                  |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                                  |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction to different structural systems, components of building systems                                                     | 3                  | 2                                     | 1        | ---             |
| 2        | Types, functions, and components of building systems                                                                             | 3                  | 2                                     | 1        | ---             |
| 3        | Initiation of analysis-design process statical system, Traditional arched girder system; design and details-Paneled beam system. | 3                  | 2                                     | 1        | ---             |
| 4        | Initiation of analysis-design process statical system, Traditional arched girder system; design and details-Paneled beam system. | 3                  | 2                                     | 1        | ---             |
| 5        | Estimation of gravity, wind and earthquake loads. Load pattern combinations                                                      | 3                  | 2                                     | 1        | ---             |



|       |                                                                                                    |   |   |   |     |
|-------|----------------------------------------------------------------------------------------------------|---|---|---|-----|
| 6     | Force redistribution in R.C. buildings                                                             | 3 | 2 | 1 | --- |
| 7     | <b>Revision and Mid Exam</b>                                                                       |   |   |   |     |
| 8     | Computer application.                                                                              | 3 | 2 | 1 | --- |
| 9     | Design and detailing requirements of Pre-stressed flat slab system with wide spans design process. | 3 | 2 | 1 | --- |
| 10    | Design and detailing requirements of Pre-stressed flat slab system with wide spans design process. | 3 | 2 | 1 | --- |
| 11    | Design and detailing requirements of shell structures and domes                                    | 3 | 2 | 1 | --- |
| 12    | Design and detailing requirements of shell structures and domes                                    | 3 | 2 | 1 | --- |
| 13    | Design and detailing requirements pre-cast concrete building system                                | 3 | 2 | 1 | --- |
| 14    | Design and detailing requirements pre-cast concrete building system                                | 3 | 2 | 1 | --- |
| 15,16 | <b>Final Exam.</b>                                                                                 |   |   |   |     |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) Quiz1      | <b>6</b>                        | <b>7.5</b>    | <b>7.5%</b>                      |
| 2   | Exam 2 written (Semester work) Quiz2      | <b>8</b>                        | <b>7.5</b>    | <b>7.5%</b>                      |
| 3   | Presentation                              | <b>11</b>                       | <b>10</b>     | <b>10%</b>                       |
| 3   | Midterm exam                              | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 4   | Final Written Exam                        | <b>15</b>                       | <b>40</b>     | <b>40 %</b>                      |
| 7   | Assignments / Project /Portfolio/ Logbook | <b>6,11</b>                     | <b>15</b>     | <b>15%</b>                       |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• DESIGN OF CONCRETE STRUCTURES DAVID DARWIN 2016</li> <li>• Design of reinforced concrete structures: Dr. M. Goneem 2019</li> <li>• Design and construction of reinforced concrete structures ECP-203-2018</li> <li>• Reinforced Concrete: Park and Puly</li> <li>• Loads applied on building ECP-208</li> </ul>                                                                                                                      |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>• ASCE: American society of civil Engineering.</li> <li>• BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                                                                  |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>• <a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html</a></li> <li>• <a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li>• <a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Supplies</b>                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Electronic Programs</b>                                                                                          | AutoCAD program<br>CSI programs (SAP), PowerPoint                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Virtual Labs</b>                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Prof. Essam Khalifa</b>                                                          | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Earthquake Resistant Design</b>        |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 361</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Essam Khalifa                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

Seismicity, Code forces, distribution of shear and moments, dynamic effects, ductility; Seismic design in steel concrete and masonry. Seismic analysis methods.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A8, B1, B2</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                                                                            |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                                                                                |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Understanding of advanced concepts and theories, awareness of important current problems in the field of study, and understanding of computational and/or empirical methodologies to solve related problems.                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO2</b>                                                         | Ability to apply knowledge in a rational way to analyze a particular problem.                                                                                                                                                              |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO3</b>                                                         | Ability to use coherent approach to design a particular engineering system using existing design tools.                                                                                                                                    |
| <b>A8</b>                                                                        | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.                                                                                                                                                                                                                                                                                        | <b>LO4</b>                                                         | Discussing the mini-project output in front of the judging committee established from the course teachers and other students. Ability to communicate (oral and/or written) ideas, issues ,results and conclusions clearly and effectively. |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Able to select the suitable solving technique whether manual or using computer to solve seismic problems.                                                                                                                                  |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports,                                                                                                                                                                         | <b>LO6</b>                                                         | Use procedure of design of the seismic effect.                                                                                                                                                                                             |

|  |                                                                                                                            |  |  |
|--|----------------------------------------------------------------------------------------------------------------------------|--|--|
|  | Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. |  |  |
|--|----------------------------------------------------------------------------------------------------------------------------|--|--|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      | √                      |            | √                     | √                  |            |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                    |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                    |                    |                                       | Tutorial | Practical / Lab |
| 1        | Earthquake Ground Motion Characteristics.                          | 3                  | 2                                     | 1        | ---             |
| 2        | Response of a Single Degree of Freedom System.                     | 3                  | 2                                     | 1        | ---             |
| 3        | Seismic Analysis of Multi Degrees of Freedom Structures.           | 3                  | 2                                     | 1        | ---             |
| 4        | Code Procedures for Earthquake Resistant.                          | 3                  | 2                                     | 1        | ---             |
| 5        | Seismic Analysis Using Computer Modeling.                          | 3                  | 2                                     | 1        | ---             |
| 6        | 3D modeling for high-rise building subjected to earthquake loading | 3                  | 2                                     | 1        | ---             |

|       |                                                                                                |   |   |   |     |
|-------|------------------------------------------------------------------------------------------------|---|---|---|-----|
| 7     | <b>Revision and Mid Exam</b>                                                                   |   |   |   |     |
| 8     | Seismic behavior and design provisions of ductile moment resisting frames.                     | 3 | 2 | 1 | --- |
| 9     | Seismic Design of Reinforced Concrete Buildings.                                               | 3 | 2 | 1 | --- |
| 10    | Seismic Behavior And Design Provisions of Ductile Moment Resisting Reinforced Concrete Frames. | 3 | 2 | 1 | --- |
| 11    | Seismic Design of Steel Buildings.                                                             | 3 | 2 | 1 | --- |
| 12    | Seismic Behavior And Design Provisions of Ductile Moment Resisting Steel Frames.               | 3 | 2 | 1 | --- |
| 13    | Free and Forced vibrations.                                                                    | 3 | 2 | 1 | --- |
| 14    | Introduction to Time History Analysis.                                                         | 3 | 2 | 1 | --- |
| 15,16 | <b>Final Exam.</b>                                                                             |   |   |   |     |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) Quiz1      | 6                               | 7.5           | 7.5%                             |
| 2   | Exam 2 written (Semester work) Quiz2      | 8                               | 7.5           | 7.5%                             |
| 3   | Presentation                              | 11                              | 10            | 10%                              |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15                              | 40            | 40 %                             |
| 7   | Assignments / Project /Portfolio/ Logbook | 6,11                            | 15            | 15%                              |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>DESIGN OF CONCRETE STRUCTURES DAVID DARWIN 2016</li> <li>Design of reinforced concrete structures: Dr. M. Goneem 2019</li> <li>Design and construction of reinforced concrete structures ECP-203-2018</li> <li>Reinforced Concrete: Park and Puly</li> <li>Loads applied on building ECP-208</li> </ul>                                                                                                                          |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>ACI-318: American concrete institute (American code for design of reinforced concrete structures.</li> <li>ASCE: American society of civil Engineering.</li> <li>BS-8110: British code for design of reinforced concrete structures.</li> </ul>                                                                                                                                                                                  |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li><a href="https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html">https://dokumen.tips/documents/design-of-reinforced-concrete-structure-volume-1-dr1-mashhour-a-ghoneim.html</a></li> <li><a href="http://www.hbrc.edu.eg/">http://www.hbrc.edu.eg/</a></li> <li><a href="https://www.concrete.org/middleeast.aspx">https://www.concrete.org/middleeast.aspx</a></li> </ul> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                          | <b>Supplies</b>                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Electronic Programs</b>                                                                                          | AutoCAD program<br>CSI programs (SAP), PowerPoint                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                          | <b>Virtual Labs</b>                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Prof. Essam Khalifa</b>                                                          | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

## 1. Basic information:

|                                                                                                                 |                                                |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Structural Maintenance and Retrofitting</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 363</b>                                 |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                              |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                             | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                              | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                       |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                              |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>          |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Sherif H. Al-Tersawy                     |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department      |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                             |                  |                        |              |

## 2-Course Overview (Brief summary of scientific content):

Repair of concrete structures, causes and positions of cracks, materials used in repair, strengthening of structures and foundation, repair and strengthening of steel structures, seismic retrofitting.



### 3-Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs)<br><br><b>A2, A3, A4, A9, B1, B2</b> |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                       |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                                                                         |
| <b>Code</b>                                                                                                           | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                                                                             |
| <b>A2</b>                                                                                                             | Develop and conduct appropriate experimentation, analyze and interpret data, assess and evaluate findings, and engineering judgment to draw conclusions.                                                                                                                                                            | <b>LO1</b>                                                         | Conduct non-destructive field tests for structural elements.                                                                                                                                                            |
|                                                                                                                       |                                                                                                                                                                                                                                                                                                                     | <b>LO2</b>                                                         | Analyze and interpret data from inspection process.                                                                                                                                                                     |
|                                                                                                                       |                                                                                                                                                                                                                                                                                                                     | <b>LO3</b>                                                         | Use objective engineering judgement to draw conclusions considering the most effective techniques.                                                                                                                      |
| <b>A3</b>                                                                                                             | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO4</b>                                                         | Apply design process to produce cost, time, architectural, and environmental solutions that meet specified retrofitting, maintenance, or strengthening needs.                                                           |
| <b>A4</b>                                                                                                             | Utilize engineering technologies, codes of practice and standards, quality guidelines, health and safety requirements.                                                                                                                                                                                              | <b>LO5</b>                                                         | Utilize codes, and standards in the choice of concrete ingredients, retrofitting or strengthening elements.                                                                                                             |
| <b>A9</b>                                                                                                             | Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                       | <b>LO6</b>                                                         | Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations during and after the maintenance, retrofitting, or strengthening program. |
| <b>B1</b>                                                                                                             | Select appropriate and sustainable technologies for retrofitting of buildings; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques.                                                                                     | <b>LO7</b>                                                         | Use testing of aggregates, cement, fresh concrete, and hard concrete as a requirement of properties and testing of materials.                                                                                           |
| <b>B2</b>                                                                                                             | Achieve an optimum design of Reinforced Concrete and Steel                                                                                                                                                                                                                                                          | <b>LO8</b>                                                         | Achieve an optimum design of reinforced concrete and steel structures.                                                                                                                                                  |

|  |                                                         |  |  |
|--|---------------------------------------------------------|--|--|
|  | Structures, Foundations and Earth Retaining Structures. |  |  |
|--|---------------------------------------------------------|--|--|

#### 4-Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        | √          |                       | √                  |            |                |            | √             | √                  |                                          | √            | √          | √               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                                                                              | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                                                                                                  |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                                                                                                                  |                    |                                       | Tutorial | Practical / Lab |
| 1        | Introduction: difference between Maintenance, Repair, and Strengthening                                                                                                                                          | 3                  | 2                                     | 1        | --              |
| 2        | Serviceability defects and structural defects- (Non-destructive fields testing)<br>Presentation of a model containing various structural elements and identification of suitable strengthening methods for each. | 3                  | 2                                     | 1        | --              |
| 3        | Passive and active cracks and methodologies of repair- (non-destructive fields testing)                                                                                                                          | 3                  | 2                                     | 1        | --              |

|       |                                                                                                                                                                           |   |   |   |    |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
|       | Practical implementation or software-based simulation to apply strengthening techniques to the model                                                                      |   |   |   |    |
| 4     | Causes of structural defects - (non-destructive fields testing).<br>Discussion of results and evaluation of student performance through a mini-project or applied report. | 3 | 2 | 1 | -- |
| 5     | Inspection reports and field applications                                                                                                                                 | 3 | 2 | 1 | -- |
| 6     | Actual case studies - (Non-destructive fields testing)                                                                                                                    | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                              |   |   |   |    |
| 8     | Calculation sheet for strengthening of slabs using non-composite steel beams                                                                                              | 3 | 2 | 1 | -- |
| 9     | Calculation sheet for strengthening of slabs using composite sections                                                                                                     | 3 | 2 | 1 | -- |
| 10    | Introduction to FRP (types- advantages- and disadvantages)                                                                                                                | 3 | 2 | 1 | -- |
| 11    | Code review of FRP                                                                                                                                                        | 3 | 2 | 1 | -- |
| 12    | Examples of strengthening slabs using FRP in Shear                                                                                                                        | 3 | 2 | 1 | -- |
| 13    | Examples of strengthening slabs using FRP in Shear                                                                                                                        | 3 | 2 | 1 | -- |
| 14    | Examples of strengthening columns using FRP in compression                                                                                                                | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                        |   |   |   |    |

### **Experiment Topics (Virtual lap):**

| Serial | Experiment                                      |
|--------|-------------------------------------------------|
| 1      | Review on Destructive and Non-Destructive Tests |

### **5-Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 3                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work) | 6                               | 10            | 10 %                             |

|   |                    |        |    |      |
|---|--------------------|--------|----|------|
| 3 | Midterm exam       | 7      | 20 | 20 % |
| 4 | Final Written Exam | 15, 16 | 40 | 40 % |
| 5 | Case Study report  | 14     | 10 | 10%  |
| 6 | Assignments        | 12     | 10 | 10%  |

### **6-Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | اسس تصميم واشتراطات التنفيذ لحماية المنشآت، اللجنة الدائمة، 0222. ISBN 5324K                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Other References</b>                                                                                             | -Stelios Antoniou, Seismic Retrofit of Existing Reinforced Concrete Buildings-<br>ch4- Methods for Strengthening Reinforced Concrete Buildings, Wiley,<br><a href="https://doi.org/10.1002/9781119987352.ch4">https://doi.org/10.1002/9781119987352.ch4</a> , 2023.<br>-محمد عبد الله نجيب، اصلاح وحماية المنشآت الخرسانية المسلحة، دار الكتب العلمية ISBN 5620. 0220<br>شريف فتحى الشافعى، الاساليب الفنية الحديثة لصيانة العناصر الانشائية، ISBN 5629. 0222 |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://egy.sika.com/">https://egy.sika.com/</a>                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB – Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | <b>Data Show, White Board</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                          | <b>Supplies</b>                                                                                                     | <b>Testing Specimens: Concrete Cubes and Cylinders.</b>                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                          | <b>Electronic Programs</b>                                                                                          | <b>Autocad, SAFE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|                  |                                                                                     |                                                                                      |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
| <b>Name</b>      | <b>Prof. Sherif H. Al-Tersawy</b>                                                   | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                                          |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Selected Topics in Concrete Design and Technology</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 364</b>                                           |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                        |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                                       | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                        | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                                 |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                          |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                        |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>                    |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Prof. Sherif H. Al-Tersawy                               |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department                |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                                       |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Design of special concrete mixes, curing methods, admixtures, fiber reinforced concrete, polymer concrete, hot and cold weather concreting, concrete construction in hot weather with special reference to middle east countries, deterioration, maintenance and repair, precast concrete, concrete production and quality concrete.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                              |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>A3, A4, B1, B2</b>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                              |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                  |
| <b>A3</b>                                                                        | <b>Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.</b>                                                                                         | <b>LO1</b>                                                         | <b>Identify fundamentals of special concrete</b>                                                             |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>LO2</b>                                                         | <b>Formulate and understand mix design equations.</b>                                                        |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>LO3</b>                                                         | <b>Apply engineering design processes to produce special concrete.</b>                                       |
| <b>A4</b>                                                                        | <b>Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.</b>                                                                                                                                                                                                                                 | <b>LO4</b>                                                         | <b>Utilize codes, and standards in the choice of concrete ingredients and concrete manufacturing process</b> |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>LO5</b>                                                         | <b>Utilize codes, and standards in the choice of materials.</b>                                              |
| <b>B1</b>                                                                        | <b>Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.</b> | <b>LO6</b>                                                         | <b>Select material properties according to design requirements and field conditions.</b>                     |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>LO7</b>                                                         | <b>Use testing of materials used for repairing concrete structures</b>                                       |
| <b>B2</b>                                                                        | <b>Achieve an optimum design of Reinforced Concrete and Steel Structures,</b>                                                                                                                                                                                                                                                                                                                                       | <b>LO8</b>                                                         | <b>Achieve an optimum design of structures using the special concrete during construction.</b>               |

|  |                                                    |  |  |
|--|----------------------------------------------------|--|--|
|  | <b>Foundations and Earth Retaining Structures.</b> |  |  |
|--|----------------------------------------------------|--|--|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       | √                  | √          |                |            |               |                    |                                          | √            |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                              | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|----------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                  |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                  |                    |                                       | Tutorial | Practical / Lab |
| 1        | Studying the properties of high performance and high Strength concrete.          | 3                  | 2                                     | 1        | 0               |
| 2        | Studying the properties of high performance and high Strength concrete. (Cont.). | 3                  | 2                                     | 1        | 0               |
| 3        | Modern curing techniques and it's applications                                   | 3                  | 2                                     | 1        | 0               |
| 4        | Cold weather concreting                                                          | 3                  | 2                                     | 1        | 0               |
| 5        | Hot weather concreting+ quiz 1                                                   | 3                  | 2                                     | 1        | 0               |
| 6        | Properties of materials used in repair                                           | 3                  | 2                                     | 1        | 0               |

|       |                                                               |   |   |   |   |
|-------|---------------------------------------------------------------|---|---|---|---|
| 7     | <b>Revision and Mid Exam</b>                                  |   |   |   |   |
| 8     | Properties of materials used in repair (Cont.)                | 3 | 2 | 1 | 0 |
| 9     | Manufacturing of pre-cast concrete                            | 3 | 2 | 1 | 0 |
| 10    | Variability of materials+ quiz 2                              | 3 | 2 | 1 | 0 |
| 11    | Statistical Distribution of materials                         | 3 | 2 | 1 | 0 |
| 12    | Mix design of special concrete                                | 3 | 2 | 1 | 0 |
| 13    | Quality control of materials                                  | 3 | 2 | 1 | 0 |
| 14    | Quality control of materials (Cont.)+ practical and oral exam | 3 | 2 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                                            |   |   |   |   |

#### **5- Methods of students' assessment:**

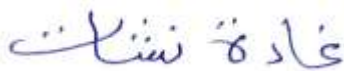
| No. | Assessment Methods *                       | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | quiz 1 written (Semester work)             | 5                               | 10            | 10 %                             |
| 2   | quiz 2 written (Semester work)             | 10                              | 10            | 10%                              |
| 3   | Midterm exam                               | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                         | 15, 16                          | 40            | 40 %                             |
| 5   | Final Practical/Clinical/... Exam          | 14                              | 5             | 5%                               |
| 6   | Final Oral Exam                            | 14                              | 5             | 5%                               |
| 7   | Tutorial and report assessment (Term Work) | weekly                          | 10            | 10%                              |

#### **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                       |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• "DESIGN OF REINFORCED CONCRETE BUILDING", CRC, 12284, NEWYORK, <b>2019</b></li> </ul>                        |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• "Concrete technology ; theory and practice" M.S. Shetty, A.K. Jan, Chand and company, <b>2019</b></li> </ul> |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                    |
|                                                                  | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                |



|                                                                          |                                |                                 |
|--------------------------------------------------------------------------|--------------------------------|---------------------------------|
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>     | <b>Compression test machine</b> |
|                                                                          | <b>Supplies</b>                | --                              |
|                                                                          | <b>Electronic Programs</b>     | --                              |
|                                                                          | <b>Skill Labs/ Simulators</b>  | --                              |
|                                                                          | <b>Virtual Labs</b>            | --                              |
|                                                                          | <b>Other (to be mentioned)</b> | --                              |

|                  |                                                                                   |                                                                                    |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
| <b>Name</b>      | <b>Prof. Sherif H. AL-Tersawy</b>                                                 | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Earth Dams</b>                         |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 371</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed Nabil                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

The principles of design and stability analysis. The choice of type of dam. Dam and highway fills. Compaction and water content control. Stress distribution and deformation within the dam and the foundation strata. The circular arc method of stability analysis. Steady seepage and rapid draw down.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                    |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>A2, A3, A10, B1, B2</b>                                                       |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                    |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                        |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Use mathematical and theories formulae to Identify Methods of analysis, compaction of fill.        |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO2</b>                                                         | Apply the different solutions of expected and unexpected technical problems earth dams' structures |
| <b>A10</b>                                                                       | Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.                                                                                                                                                                                                                                                                                                                 | <b>LO3</b>                                                         | Solve problem of earth dams' structures. Develop logical thinking.                                 |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO4</b>                                                         | Select appropriate sustainable Earth Dams.                                                         |

|           |                                                                                                                                                                                                                                                                                                                                                                |            |                                                                                                                                                         |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO5</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; in Hydrology engineering structures. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            | √                     | √                  | √          |                |            | √             |                    |                                          |              | √          |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics) | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                     |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                     |                    |                                       | Tutorial | Practical / Lab |
| 1        | Types of dams.                                      | 3                  | 2                                     | 1        | --              |
| 2        | The principles of design.                           | 3                  | 2                                     | 1        | --              |
| 3        | Stability analysis.                                 | 3                  | 2                                     | 1        | --              |

|       |                                                                                   |   |   |   |    |
|-------|-----------------------------------------------------------------------------------|---|---|---|----|
| 4     | Compaction and water content control.                                             | 3 | 2 | 1 | -- |
| 5     | Compaction and water content control (follow).                                    | 3 | 2 | 1 | -- |
| 6     | Permeability of soil                                                              | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                      |   |   |   |    |
| 8     | Permeability of soil (follow)                                                     | 3 | 2 | 1 | -- |
| 9     | Stress distribution and deformation within the dam the foundation strata          | 3 | 2 | 1 | -- |
| 10    | Stress distribution and deformation within the dam the foundation strata (follow) | 3 | 2 | 1 | -- |
| 11    | Stress distribution and deformation within the dam the foundation strata (follow) | 3 | 2 | 1 | -- |
| 12    | Stress distribution and deformation within the dam the foundation strata (follow) | 3 | 2 | 1 | -- |
| 13    | Water Seepage and rapid draw down.                                                | 3 | 2 | 1 | -- |
| 14    | Water Seepage and rapid draw down (follow).                                       | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | <b>10</b>                       | <b>10</b>     | <b>10 %</b>                      |
| 2   | Midterm exam                   | <b>7</b>                        | <b>20</b>     | <b>20 %</b>                      |
| 3   | Final Written Exam             | <b>15, 16</b>                   | <b>40</b>     | <b>40 %</b>                      |
| 4   | Assignments / Project          | <b>Weekly</b>                   | <b>30</b>     | <b>30 %</b>                      |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>FUNDAMENTALS OF OPEN CHANNEL FLOW, GLENN E. MOGLEN, CRC PRESS, 12394, NEW YORK, 2023.</li> <li>DESIGN OF SMALL DAMS, W.C.DUNKIN, SATYA P., 12102, N.DELHI, 2006.</li> </ul>                                               |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>THE ENGINEERING OF LARGE DAMS PART 1, HENRY H. THOMAS, PRENTICE H., 8796, N.DELHI 1997</li> <li>Christian Kutzner, “Earth and Rockfill Dams Principles for Design and Construction”, ISBN: 9789054106821, 1977</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                                               |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                           |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                                           |
|                                                                          | <b>Supplies</b>                                                                                                     | MS Team                                                                                                                                                                                                                                                          |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                               |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                               |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                               |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Ahmed Anbil</b>                                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Geology and Site Investigation</b>     |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 373</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed Nabil                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Geologic Information Pertinent to Civil Engineering in General and Construction Sites In particular, Site Investigation Methods in Rocks and Soils, Case Studies

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                                 |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>A1, A2, A5, A6, B1</b>                                                        |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                 |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                                     |
| <b>A1</b>                                                                        | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.                                                                                                                                                                                                                                                                            | <b>LO1</b>                                                         | Discover all the information on foundation soil from the engineering standpoint of view.                        |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO2</b>                                                         | Conduct field tests on foundation soil and evaluate the gained data to get the physical properties of the soil. |
| <b>A5</b>                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                                                                                                                                                                                                                                                  | <b>LO3</b>                                                         | Choose the suitable method to implement the site exploration                                                    |
| <b>A6</b>                                                                        | Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements                                                                                                                                                                                                                                                                                     | <b>LO4</b>                                                         | Plan the number and depth of boreholes on the simple sketch of the project layout.                              |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Use physical measurement from field tests to identify soil subsurface types.                                    |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO6</b>                                                         | Predict foundation soil settlement under the isolated footing                                                   |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO7</b>                                                         | Determine the required soil sample types to perform laboratory soil tests                                       |



#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       |                    |            |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course (Course Topics)                                                                                  | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                                   |                    | Theoretical teaching (lectures)       | Training |                 |
|          |                                                                                                                                   |                    |                                       | Tutorial | Practical / Lab |
| 1        | Purpose of Site Investigation, Identify and coordinate suitable geological sites.                                                 | 2                  | 2                                     | 1        | --              |
| 2        | Subsurface Exploration Program, Identify and coordinate suitable geological sites.                                                | 2                  | 2                                     | 1        | --              |
| 3        | Determine the depth, Number and Distribution of Boreholes. Prepare students with background information and safety guidelines.    | 2                  | 2                                     | 1        | --              |
| 4        | Examples on determination of number and depth of boreholes                                                                        | 2                  | 2                                     | 1        | --              |
| 5        | Predict the different types of settlement of foundation soil. Prepare students with background information and safety guidelines. | 2                  | 2                                     | 1        | --              |
| 6        | Continue the topic in week 5. Conduct the first field visit and assign a reflection report.                                       | 2                  | 2                                     | 1        | --              |

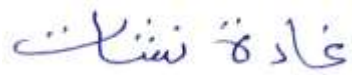
|       |                                                                                                                                                                                                                             |   |   |   |    |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                                                                |   |   |   |    |
| 8     | Identify The main components of site investigation report.<br><br>Methods of Advancing Boreholes:<br>1. Test Pits (Open Pits)<br>2. Manual Boreholes<br>3. Continuous Flight Auger<br>4. Wash Boring<br>Percussion Drilling | 2 | 2 | 1 | -- |
| 9     | Discuss the types of Soil Samples<br>1. Disturbed sample<br>2. Undisturbed sample<br>The laboratory test types carried out on each type.<br>Organize a second visit with a group presentation or discussion.                | 2 | 2 | 1 | -- |
| 10    | Methods of Soil Sampling                                                                                                                                                                                                    | 2 | 2 | 1 | -- |
| 11    | Field test: SPT & CPT                                                                                                                                                                                                       | 2 | 2 | 1 | -- |
| 12    | Field test: CPT. Collect student feedback and evaluate the impact on learning.                                                                                                                                              | 2 | 2 | 2 | -- |
| 13    | Plate loading test and vane shear test                                                                                                                                                                                      | 2 | 2 | 1 | -- |
| 14    | Geophysical investigation                                                                                                                                                                                                   | 2 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                                                          |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            | 6                               | 10            | 10%                              |
| 2   | Exam 2 written (Semester work)            | 10                              | 10            | 10%                              |
| 3   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project /Portfolio/ Logbook | WEEKLY                          | 20            | 20%                              |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• BERNARDO CAICEDO “GEOTECHNICS OF ROADS FUNDAMENTALS”, CRC PRESS, 12159, LONDON, <b>2019</b></li> <li>• SOIL MECHANICS THROUGH PROJECT, IVAN GRATCHEV, CRC PRESS, 12170, LONDON, <b>2019</b></li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Amer Radwan. "A course in Soil; Mechanics”, Dar El-Maarif, 2007</li> </ul>                                                                                                                             |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                              |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                          |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                                          |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                              |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                              |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                              |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                              |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                              |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Ahmed Anbil</b>                                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Rock Mechanics</b>                     |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 375</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed Nabil                           |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Physical basis of strength in rock. Elastic, plastic, brittle and creep behavior. Measurement of static and dynamic properties in field and laboratory. Application of rock mechanics to civil engineering problems. General characteristics of Local limestone.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                              | Course Learning Outcomes                                    |                                                                                                                                                  |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| A2, A3, B1, B3                                                            |                                                                                                                                                                                                                                                                                                                                                                                                              | Upon completion of the course, the student will be able to: |                                                                                                                                                  |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                                                                                                         | Code                                                        | Text                                                                                                                                             |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | LO1                                                         | Identify the geological and mechanical types of rocks and characteristics of local limestone.                                                    |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                              | LO2                                                         | Evaluate the different types of rocks.                                                                                                           |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | LO3                                                         | Apply in the student's analysis, problem identification, capability of creative thinking and obtaining solutions in the field of rock mechanics. |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | LO4                                                         | Test the foundation in rocks.                                                                                                                    |

|           |                                                                                                                                                                                                             |            |                                                                                                           |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------|
| <b>B3</b> | Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects | <b>LO5</b> | Address the overall view of the different types of rocks on various practical civil engineering problems. |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    | √                    |                        |            |                       | √                  |            |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                       | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|---------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                           |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                           |                    |                                       | Tutorial | Practical / Lab |
| 1        | Geological classification of rocks                                        | 3                  | 2                                     | 1        | --              |
| 2        | Geological classification of rocks (follow)                               | 3                  | 2                                     | 1        | --              |
| 3        | Mechanical classification of rocks and characteristics of local limestone | 3                  | 2                                     | 1        | --              |

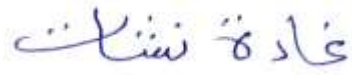
|       |                                                                                                    |   |   |   |    |
|-------|----------------------------------------------------------------------------------------------------|---|---|---|----|
| 4     | Mechanical classification of rocks and characteristics of local limestone (follow)                 | 3 | 2 | 1 | -- |
| 5     | Mineralogical composition and rock structures.                                                     | 3 | 2 | 1 | -- |
| 6     | Mineralogical composition and rock structures (follow)                                             | 3 | 2 | 1 | -- |
| 7     | <b>Revision and Mid Exam</b>                                                                       |   |   |   |    |
| 8     | Secondary structure of rocks.                                                                      | 3 | 2 | 1 | -- |
| 9     | Physical properties of rocks.                                                                      | 3 | 2 | 1 | -- |
| 10    | Mechanical properties of rocks and effect of stress.                                               | 3 | 2 | 1 | -- |
| 11    | Foundation on rocks and application of rock mechanics to civil engineering problems                | 3 | 2 | 1 | -- |
| 12    | Foundation on rocks and application of rock mechanics to civil engineering problems (follow)       | 3 | 2 | 1 | -- |
| 13    | Foundation tests in rocks and measurement of static and dynamic properties in field and laboratory | 3 | 2 | 1 | -- |
| 14    | Foundation tests in rocks and measurement of static and dynamic properties in field and laboratory | 3 | 2 | 1 | -- |
| 15,16 | <b>Final Exam.</b>                                                                                 |   |   |   |    |

**5- Methods of students' assessment:**

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 6                               | 15            | 15%                              |
| 2   | Exam 2 written (Semester work) | 10                              | 15            | 15%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project          | weekly                          | 10            | 10%                              |

## 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Nagaratnam Sivakugan, Sanjay Kumar Shukla, Braja M. Das, <b>“Rock Mechanics”</b>, CRC Press, ISBN 9780367866754, <b>2019</b></li> </ul>                                      |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>FRED G.BELL, “ENGINEERING PROPERTIES OF SOILS AND ROCKS”, ISBN 0750604891, 1992</li> <li>Egyptian Code.</li> </ul>                                                           |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <a href="https://www.routledge.com/Rock-Mechanics-An-Introduction/Sivakugan-Shukla-Das/p/book/9780367866754">https://www.routledge.com/Rock-Mechanics-An-Introduction/Sivakugan-Shukla-Das/p/book/9780367866754</a> |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                              |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                              |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                  |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                  |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                  |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                  |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                  |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Ahmed Nabil</b>                                                              | <b>Dr. Ghada Nashaat Mohamed</b>                                                     |
| <b>Signature</b> |  |  |



|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                                    |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Selected topics in geotechnical engineering</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 379</b>                                     |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                  |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                                 | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                  | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                           |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                    |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                  |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>              |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed Nabil                                    |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department          |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                                 |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

A Selection Made From: Soil Stabilization Using Conventional Stabilizers, such as Cement, Bituminous Materials and Chemicals. Soil Improvement by: Compaction, Vibroprobes, Preloading etc. Desert Soil Characteristics Including Swelling and Shrinkage, Desiccation, Collapse, Erosion and Cementation. Salt-bearing Soils, Cemented Sands and Wind-Blown Sands. Influence of water Table Fluctuation on Soil Properties. Soil Properties by Field Tests. Use of Geomembranes and Geotextiles.

### 3. Course Learning Outcomes CLOs :

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                                |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A3, A4, A5, B1, B2</b>                                                        |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                                |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                                    |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.                                                                                         | <b>LO1</b>                                                         | Evaluate, the treatment methods used to enhance the properties of problematic soils.                                                                           |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>LO2</b>                                                         | Design Foundation rested on swelling and collapsible soil                                                                                                      |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles                                                                                                                                                                                                                                 | <b>LO3</b>                                                         | Utilize the different types of Grouting process, deep compaction, and preloading techniques to solve soil problems related to bearing capacity and settlement. |
| <b>A5</b>                                                                        | Practice research techniques and methods of investigation as an inherent part of learning                                                                                                                                                                                                                                                                                                                    | <b>LO4</b>                                                         | Use the method self-learning to investigate another different method in soil improvement.                                                                      |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO5</b>                                                         | Predict the heave or settlement values using physical measurements according to Egyptian code.                                                                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                              | <b>LO6</b>                                                         | Use the odometer test to determine the accurate value of heave or settlement.                                                                                  |
| <b>B2</b>                                                                        | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least                                                                                                                                                                                                                                                                              | <b>LO7</b>                                                         | Calculate the maximum tensile strength of geogrid and length.                                                                                                  |

|                                                                                                                                                                                                                                |            |                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------|
| three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | <b>LO8</b> | Check stability of reinforced earth retaining wall according to Egyptian code |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------|

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  | √                    |                      |                        |            |                       |                    |            |                |            |               |                    |                                          |              |            |                 |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                      | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                                          |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                                          |                    |                                       | Tutorial | Practical / Lab |
| 1        | Swelling soils:<br>Definition, Types, Occurrence, Identification, Treatment, Foundation on swelling soils.               | 3                  | 2                                     | 1        | -               |
| 2        | Swelling soils (follow):<br>Definition, Types, Occurrence, Identification test, Treatment, Foundation on swelling soils. | 3                  | 2                                     | 1        | -               |
| 3        | Compaction:                                                                                                              | 3                  | 2                                     | 1        | -               |

|       |                                                                                                                             |   |   |   |   |
|-------|-----------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
|       | Definition, Objectives, Factors affecting compaction, Quality control, Equipment used in the field.                         |   |   |   |   |
| 4     | Compaction (follow):<br>Definition, Objectives, Factors affecting compaction, Quality control, Equipment used in the field. | 3 | 2 | 1 | - |
| 5     | Collapsible soils:<br>Definition, Types, Occurrence.                                                                        | 3 | 2 | 1 | - |
| 6     | Collapsible Soil Tests                                                                                                      | 3 | - | 1 | - |
| 7     | <b>Revision and Mid Exam</b>                                                                                                |   |   |   |   |
| 8     | Grouting:<br>Definition, Objectives, Methods used in the field.                                                             | 3 | 2 | 1 | - |
| 9     | Continue to the topic in week 9                                                                                             | 3 | 2 | 1 | - |
| 10    | Reinforced soil:<br>Mechanism, Objectives, Types, Methods and Material used.                                                | 3 | 1 | - | - |
| 11    | Examples on earth reinforced wall                                                                                           | 3 | 1 | 2 | - |
| 12    | Preloading:<br>Definition, Objectives, Methods used in the field.                                                           | 3 | 2 | 1 | - |
| 13    | Continue to the topic in week 13                                                                                            | 3 | 2 | 1 | - |
| 14    | Grouting:<br>Definition, Objectives, Methods used in the field.                                                             | 3 | 2 | 1 | - |
| 15,16 | <b>Final Exam.</b>                                                                                                          |   |   |   |   |

### 5- Methods of students' assessment:

| No. | Assessment Methods *           | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|--------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work) | 6                               | 10            | 10%                              |
| 2   | Exam 2 written (Semester work) | 10                              | 10            | 10%                              |
| 3   | Midterm exam                   | 7                               | 20            | 20 %                             |
| 4   | Final Written Exam             | 15, 16                          | 40            | 40 %                             |
| 5   | Assignments / Project          | WEEKLY                          | 20            | 20%                              |

### 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• SOIL MECHANICS THROUGH PROJECT, IVAN GRATCHEV, CRC PRESS, 12170, LONDON, 2019</li> <li>• BERNARDO CAICEDO “GEOTECHNICS OF ROADS FUNDAMENTALS”, CRC PRESS, 12159, LONDON, 2019</li> </ul>   |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Peter G. Nicholson, “Soil improvement and ground modification methods”, ISBN 978-0-12-408076-8, 2015</li> <li>• Amer Radwan. "A course in Soil; Mechanics”, Dar El-Maarif, 2007</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | --                                                                                                                                                                                                                                  |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                              |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Data Show, White Board                                                                                                                                                                                                              |
|                                                                          | <b>Supplies</b>                                                                                                     | --                                                                                                                                                                                                                                  |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                  |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                  |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                  |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                  |

|           | Course Coordinator                                                                | Program Coordinator                                                                |
|-----------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Name      | Dr. Ahmed Anbil                                                                   | Dr. Ghada Nashaat Mohamed                                                          |
| Signature |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                               |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Advanced Technologies for Construction</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 381</b>                                |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                             |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                            | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                             | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                      |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                               |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                             |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>         |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Asmaa Ahmed Soliman                       |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department     |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                            |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Advanced technologies include microcomputer systems, management information systems, automation technologies, computer-aided design, and expert systems and their application in the construction industry. Overview of systems acquisition, communications, and networking.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | <b>Course Learning Outcomes</b>                                    |                                                                                                                                                    |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A2, A3, A4, B1, B2</b>                                                        |                                                                                                                                                                                                                                                                                                                     | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                                                                    |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                         | <b>Code</b>                                                        | <b>Text</b>                                                                                                                                        |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | <b>LO 1</b>                                                        | Identify the general characteristics of the construction industry.                                                                                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO 2</b>                                                        | Illustrate the traditional industry methods and innovative new practices                                                                           |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO 3</b>                                                        | Developing advanced construction technology into practice can increase levels of quality, efficiency, safety, sustainability, and value for money. |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO 4</b>                                                        | Study the different types of advanced technology                                                                                                   |
| <b>A3</b>                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <b>LO 5</b>                                                        | Illustrate Artificial Intelligence areas (Computerized speech recognition, Natural language processing, Computer vision, and expert systems)       |
| <b>A4</b>                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | <b>LO 6</b>                                                        | Study the expert systems Components.                                                                                                               |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO 7</b>                                                        | Study the expert systems applications such as high-risk credit decisions, advertising decision-making, and manufacturing decisions                 |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO 8</b>                                                        | Illustrate the benefits of Expert Systems                                                                                                          |
|                                                                                  |                                                                                                                                                                                                                                                                                                                     | <b>LO 9</b>                                                        | Study the limitations of Expert Systems in the construction industry                                                                               |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements                                                                                                                                     | <b>LO 10.</b>                                                      | Understand the Networks Components Functionality                                                                                                   |



|           |                                                                                                                                                                                                                                                                                                                                                               |               |                                                                               |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------|
|           | and/or testing by applying a full range of civil engineering concepts and techniques                                                                                                                                                                                                                                                                          |               |                                                                               |
| <b>B2</b> | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline | <b>LO 11.</b> | Illustrate the construction process                                           |
|           |                                                                                                                                                                                                                                                                                                                                                               | <b>LO 12.</b> | Study the responsibilities of all project parties in the construction process |

#### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| √                  |                      | √                    | √                      |            |                       | √                  | √          |                |            |               |                    |                                          |              | √          | √               |

**Course Schedule:**

| Week No. | Scientific content of the course<br>(Course Topics)                             | Total Weekly Hours | Expected number of the Learning Hours |          |                |
|----------|---------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|----------------|
|          |                                                                                 |                    | Theoretical teaching<br>(lectures)    | Training |                |
|          |                                                                                 |                    |                                       | Tutorial | Practical /Lab |
| 1        | Introduction to the general characteristics of the construction industry.       | 3                  | 2                                     | 1        | --             |
| 2        | Study of Advanced construction technology.                                      | 3                  | 2                                     | 1        | --             |
| 3        | Study of Advanced construction technology.                                      | 3                  | 2                                     | 1        | --             |
| 4        | Review the applied Artificial Intelligence (AI).                                | 3                  | 2                                     | 1        | --             |
| 5        | Studying the expert systems and their application in the construction industry. | 3                  | 2                                     | 1        | --             |
| 6        | Studying the expert systems and their application in the construction industry. | 3                  | 2                                     | 1        | --             |
| 7        | <b>Revision and Mid Exam</b>                                                    |                    |                                       |          |                |
| 8        | Review of systems acquisition, communications, and networking.                  | 3                  | 2                                     | 1        | --             |
| 9        | Review of systems acquisition, communications, and networking.                  | 3                  | 2                                     | 1        | --             |
| 10       | The construction process is followed from project inception to closeout         | 3                  | 2                                     | 1        | --             |
| 11       | The construction process is followed from project inception to closeout         | 3                  | 2                                     | 1        | --             |
| 12       | The construction process is followed from project inception to closeout.        | 3                  | 2                                     | 1        | --             |
| 13       | The construction process is followed from project inception to closeout.        | 3                  | 2                                     | 1        | --             |
| 14       | Revision before the final exam                                                  | 3                  | 2                                     | 1        | --             |
| 15,16    | <b>Final Exam.</b>                                                              |                    |                                       |          |                |

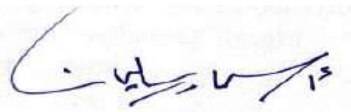
**5- Methods of students' assessment:**

| No. | Assessment Methods * | Assessment Timing<br>(Week Number) | Marks/<br>Scores | Percentage of<br>total course<br>Marks |
|-----|----------------------|------------------------------------|------------------|----------------------------------------|
| 1   | Quiz 1               | 4                                  | 10               | 10%                                    |
| 2   | Quiz 2               | 12                                 | 10               | 10%                                    |

|   |                                |        |    |      |
|---|--------------------------------|--------|----|------|
| 3 | Midterm exam                   | 7      | 20 | 20 % |
| 4 | Final Written Exam             | 15, 16 | 40 | 40 % |
| 5 | Tutorial and report assessment | weekly | 20 | 20%  |

### **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• CONSTRUCTION PROJECT MANAGEMENT THEORY AND PR,LARRY MCKENZIE, SYRAWOOD, NEW YORK, 2023</li> </ul>                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• الكود المصري لإدارة مشروعات التشييد كود رقم 311 – 2024 – وزارة الاسكان والمرافق والتنمية العمرانية – المركز القومي لبحوث الاسكان</li> <li>• Introduction to Construction Management; Fred Sherratt, 2015, Routledge Publishing</li> <li>• Handbook of Construction Management: Scope, Schedule, and Cost Control; Abdul Razzak Ruman; 2016, Publisher CRC Press</li> </ul> |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <b>American Society of Civil Engineering,</b><br><a href="https://www.asce.org/">https://www.asce.org/</a>                                                                                                                                                                                                                                                                                                          |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Projector- White board                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                          | <b>Supplies</b>                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                  |

|                  | <b>Course Coordinator</b>                                                           | <b>Program Coordinator</b>                                                           |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr. Asmaa Ahmed Soliman                                                             | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Construction management</b>            |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 383</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                         | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | Elective                                  |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Asmaa Ahmed Soliman                   |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

The nature of construction industry. Construction administration. Factors affecting the selection of construction equipment. Construction equipment and methods, work improvement in construction management. Cost estimation. Concrete forms. Safety in construction

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | Course Learning Outcomes                                    |                                                                                           |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| A2, A3, A4, A10, B1, B2, B4                                               |                                                                                                                                                                                                                                                                                                                     | Upon completion of the course, the student will be able to: |                                                                                           |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                | Code                                                        | Text                                                                                      |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | LO1                                                         | identify the different phases in the construction project life cycle                      |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO2                                                         | Explains selecting the type of contracts                                                  |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO3                                                         | Illustrate the overlapping between different phases.                                      |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | LO4                                                         | Illustrate Purchasing with cash factors                                                   |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO5                                                         | Illustrate financing through loan factors                                                 |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO6                                                         | Illustrate renting and leasing factors.                                                   |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | LO7                                                         | Understand the value of equipment                                                         |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO8                                                         | Study the key ways for improving equipment productivity.                                  |
| A10                                                                       | Acquire and apply new technology; and practice self; lifelong; and other learning strategies                                                                                                                                                                                                                        | LO9                                                         | Apply the different topic of planning on Primavera tool and on actual case studies.       |
| B1                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full                                                                                                   | LO10                                                        | Understanding and computing the project costs depend on different cost estimation methods |

|    |                                                                                                                                                                                                                                                                                                                                                                |      |                                                                                           |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------|
|    | range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.                                                                                                                                                                      |      |                                                                                           |
| B2 | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | LO11 | Understanding and computing the project costs depend on different cost estimation methods |
|    |                                                                                                                                                                                                                                                                                                                                                                | LO12 | Study the different ways to prevent injuries and improve safety                           |
| B4 | Deal with biddings, contracts and financial issues including project insurance and guarantees                                                                                                                                                                                                                                                                  | LO13 | Develop the Knowledge of construction contracts on project insurance and guarantees       |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brainstorming        | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | -                    | ✓                      | -          | -                     | -                  | -          | -              | -          | -             | -                  | -                                        | -            | -          | -               |

**Course Schedule:**

| Week No. | Scientific content of the course<br>(Course Topics)                                               | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|---------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                                   |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                                   |                    |                                       | Tutorial | Practical / Lab |
| 1        | Identify The nature of the construction industry.                                                 | 3                  | 2                                     | 1        | 0               |
| 2        | Study of different phases in the construction project life cycle                                  | 3                  | 2                                     | 1        | 0               |
| 3        | Study of selecting the type of contracts and illustrate the overlapping between different phases. | 3                  | 2                                     | 1        | 0               |
| 4        | Study Factors affecting the selection of construction equipment                                   | 3                  | 2                                     | 1        | 0               |
| 5        | Study Factors affecting the selection of construction equipment                                   | 3                  | 2                                     | 1        | 0               |
| 6        | Study the Factors affecting the selection of construction equipment                               | 3                  | 2                                     | 1        | 0               |
| 7        | <b>Revision and Mid Exam</b>                                                                      |                    |                                       |          |                 |
| 8        | Study of Construction equipment and methods, work improvement in construction management          | 3                  | 2                                     | 1        | 0               |
| 9        | Study of Construction equipment and methods, work improvement in construction management          | 3                  | 2                                     | 1        | 0               |
| 10       | Illustrate Cost estimation methods (Parametric Methods)                                           | 3                  | 2                                     | 1        | 0               |
| 11       | Illustrate Cost estimation methods (Bottom- UP Methods, Analogue)                                 | 3                  | 2                                     | 1        | 0               |
| 12       | Study Safety in construction.                                                                     | 3                  | 2                                     | 1        | 0               |
| 13       | Study the Safety in construction.                                                                 | 3                  | 2                                     | 1        | 0               |
| 14       | <b>Revision</b>                                                                                   |                    |                                       |          |                 |
| 15,16    | <b>Final Exam.</b>                                                                                |                    |                                       |          |                 |

**5- Methods of students' assessment:**

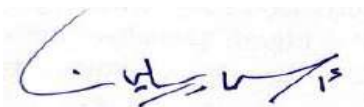
| No. | Assessment Methods * | Assessment Timing<br>(Week Number) | Marks/<br>Scores | Percentage of<br>total course<br>Marks |
|-----|----------------------|------------------------------------|------------------|----------------------------------------|
|-----|----------------------|------------------------------------|------------------|----------------------------------------|

|   |                                           |        |    |      |
|---|-------------------------------------------|--------|----|------|
| 1 | Exam 1 written (Semester work)            | 2      | 10 | 10 % |
| 2 | Exam 2 written (Semester work)            | 6      | 10 | 10 % |
| 3 | Exam 3 written (Semester work)            | 12     | 10 | 10 % |
| 4 | Midterm exam                              | 7      | 20 | 20 % |
| 5 | Final Written Exam                        | 15, 16 | 40 | 40 % |
| 6 | Assignments / Project /Portfolio/ Logbook | 10     | 10 | 10 % |

## **6- Learning Resources and Supportive Facilities \***

|                                                                          |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>Introduction to Construction Management; Fred Sherratt, 2015, Routledge Publishing ,ISBN (9781032007441)</li> <li>Handbook of Construction Management: Scope, Schedule, and Cost Control; Abdul Razzak Ruman; 2016, Publisher CRC Press, ISBN (1482226642)</li> <li>Handbook of Construction Management: Scope, Schedule, and Cost Control; Abdul Razzak Ruman; 2016, Publisher CRC Press, ISBN (1482226642)</li> </ul> |
|                                                                          | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>الكود المصري لإدارة مشروعات التشييد كود رقم 311 – 2009 – وزارة الاسكان والمرافق والتنمية العمرانية –المركز القومي لبحوث الاسكان</li> </ul>                                                                                                                                                                                                                                                                              |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <p>Construction Management Association of America; <a href="https://www.cmaanet.org/">https://www.cmaanet.org/</a> (1982-now)</p> <p>Project Management Institute; <a href="https://www.pmi.org/">https://www.pmi.org/</a> (1969- now)</p>                                                                                                                                                                                                                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          | Projector- White board- Personal Computer- Microsoft Team                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                          | <b>Supplies</b>                                                                                                     | Lecture notes                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                          | <b>Electronic Programs</b>                                                                                          | --                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       | --                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Virtual Labs</b>                                                                                                 | --                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      | --                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                          | <b>Course Coordinator</b>                                                                                           | <b>Program Coordinator</b>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Name</b>                                                              | <b>Dr. Asmaa Ahmed Soliman</b>                                                                                      | <b>Dr. Ghada Nashaat Mohamed</b>                                                                                                                                                                                                                                                                                                                                                                                                                               |



|           |                                                                                   |           |
|-----------|-----------------------------------------------------------------------------------|-----------|
| Signature |  | غادة نسيك |
|-----------|-----------------------------------------------------------------------------------|-----------|

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### 1. Basic information:

|                                                                                                                 |                                                    |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Selected Topics in Construction Engineering</b> |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>CIV 385</b>                                     |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                                  |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                                 | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | 2                                                  | 1                |                        | 3            |
| <b>Course Type:</b>                                                                                             | <b>Elective</b>                                    |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                                    |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                                  |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>              |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Asmaa Ahmed Soliman                            |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department          |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                                 |                  |                        |              |

### 2. Course Overview (Brief summary of scientific content):

Selection Made From: Construction Planning, Scheduling and Control. Construction Contract Documents, Specifications, Agreements and General Conditions. Construction Equipment. Erection Methods, Design and Application of Concrete Formwork. Construction Materials with Emphasis on Concrete. Value Engineering and Logistics. Selected Case Studies.

### 3. Course Learning Outcomes CLOs :

Matrix of course learning outcomes CLOs with program outcomes POs (NARS).

| Program Outcomes (NARS)<br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                     | Course Learning Outcomes                                    |                                                                                                          |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| A2, A3, A4, A5, A7, B3, B4                                                |                                                                                                                                                                                                                                                                                                                     | Upon completion of the course, the student will be able to: |                                                                                                          |
| Code                                                                      | Text                                                                                                                                                                                                                                                                                                                | Code                                                        | Text                                                                                                     |
| A2                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                   | LO1                                                         | Identify the Express ideas in different construction phases.                                             |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO2                                                         | Use mathematical and theories formulae to solve construction equipment economics, modelling and design.  |
| A3                                                                        | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | LO3                                                         | Apply the different solutions of expected and unexpected technical problems related to annotated topics. |
| A4                                                                        | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.                                                                                                                                        | LO4                                                         | Describe the construction resource engineering projects.                                                 |
|                                                                           |                                                                                                                                                                                                                                                                                                                     | LO5                                                         | State the productivity and equipment for construction financial analysis                                 |
| A5                                                                        | Practice research techniques and methods of investigation as an inherent part of learning.                                                                                                                                                                                                                          | LO6                                                         | Illustrate the productivity and equipment for construction                                               |
| A7                                                                        | Function efficiently as an individual and as a member of multidisciplinary and multi-cultural teams.                                                                                                                                                                                                                | LO7                                                         | Plan and schedule construction resources                                                                 |
| B3                                                                        | Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction                                                                                                                                                                      | LO8                                                         | Develop the Knowledge of construction resource management, and its applications                          |

|    |                                                                                              |     |                                                                                                                                                                           |
|----|----------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | and materials; and assess environmental impacts of projects.                                 |     |                                                                                                                                                                           |
| B4 | Deal with Bidding, Contracts and financial issues including project insurance and guarantees | LO9 | Apply the different solutions of expected and unexpected technical problems related Bidding, Contracts specially insurance and guarantees of construction heavy equipment |

#### 4. Course Teaching and Learning Methods:

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
| ✓                  | ✓                    | -                    | ✓                      | -          | -                     | -                  | -          | -              | -          | -             | -                  | -                                        | -            | -          | -               |

#### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                                                                                   | Total Weekly Hours | Expected number of the Learning Hours |          |                |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|----------------|
|          |                                                                                                                                                       |                    | Theoretical teaching (lectures)       | Training |                |
|          |                                                                                                                                                       |                    |                                       | Tutorial | Practical /Lab |
| 1        | Construction resource productivity. Introduction to Primavera and its importance in project management.                                               | 3                  | 2                                     | 1        | 0              |
| 2        | Construction resource productivity. Practical training on developing a Work Breakdown Structure (WBS) and scheduling project activities in Primavera. | 3                  | 2                                     | 1        | 0              |

|       |                                                                                                                                                                                        |   |   |   |   |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 3     | Introduction to equipment construction. Analysis of a real project and application of planning steps using Primavera.                                                                  | 3 | 2 | 1 | 0 |
| 4     | Introduction to equipment construction Submission and presentation of applied student projects that include a full project plan using Primavera, with results discussed and evaluated. | 3 | 2 | 1 | 0 |
| 5     | Techniques for equipment construction cycle.                                                                                                                                           | 3 | 2 | 1 | 0 |
| 6     | Techniques for equipment construction cycle.                                                                                                                                           | 3 | 2 | 1 | 0 |
| 7     | <b>Revision and Mid Exam</b>                                                                                                                                                           |   |   |   |   |
| 8     | Economics in construction equipment                                                                                                                                                    | 3 | 2 | 1 | 0 |
| 9     | Economics in construction equipment                                                                                                                                                    | 3 | 2 | 1 | 0 |
| 10    | Economics in construction equipment                                                                                                                                                    | 3 | 2 | 1 | 0 |
| 11    | Value Engineering and Logistics                                                                                                                                                        | 3 | 2 | 1 | 0 |
| 12    | Value Engineering and Logistics                                                                                                                                                        | 3 | 2 | 1 | 0 |
| 13    | Construction Planning, Scheduling and Control                                                                                                                                          | 3 | 2 | 1 | 0 |
| 14    | Construction Planning, Scheduling and Control                                                                                                                                          | 3 | 2 | 1 | 0 |
| 15,16 | <b>Final Exam.</b>                                                                                                                                                                     |   |   |   |   |

#### **5- Methods of students' assessment:**

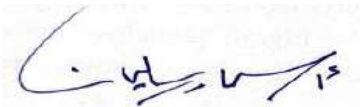
| No. | Assessment Methods *                      | Assessment Timing (Week Number) | Marks/ Scores | Percentage of total course Marks |
|-----|-------------------------------------------|---------------------------------|---------------|----------------------------------|
| 1   | Exam 1 written (Semester work)            | 2                               | 10            | 10 %                             |
| 2   | Exam 2 written (Semester work)            | 6                               | 10            | 10 %                             |
| 3   | Exam 3 written (Semester work)            | 12                              | 10            | 10 %                             |
| 4   | Midterm exam                              | 7                               | 20            | 20 %                             |
| 5   | Final Written Exam                        | 15, 16                          | 40            | 40 %                             |
| 6   | Assignments / Project /Portfolio/ Logbook | 10                              | 10            | 10 %                             |

## **6- Learning Resources and Supportive Facilities \***

|                                                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b> | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | <ul style="list-style-type: none"> <li>• Construction Project Management Theory and Practice, Larry Mckenzie, Kaufman Press Library, 12355, U.S.A, <b>2024</b>.</li> <li>• Handbook of Construction Management: Scope, Schedule, and Cost Control; Abdul Razzak Ruman; <b>2016</b>, Publisher CRC Press, ISBN (1482226642)</li> <li>• Construction Planning, Equipment, and Methods, Ninth Edition 9th Edition; Robert L. Peurifoy - et al; <b>2018</b>, Publisher McGraw-Hill Education, ISBN (9781260108804)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                  | <b>Other References</b>                                                                                             | <ul style="list-style-type: none"> <li>• Construction Equipment Management; Schaufelberger, John E.- Migliaccio, Giovanni C.; 2019, Routledge Publishing, ISBN (9781351117463)</li> <li>• Building Construction Costs with RSMeans Data 2022 (Means Building Construction Cost Data) Annual Edition; Matthew Doheny; 2022, Publisher R S Means Co, ISBN (195534101X)</li> <li>• Contractor's Pricing Guide with RS Means Data 2022: Residential Repair &amp; Remodeling Costs (Means Contractor's Pricing Guide: Residential Repair &amp; Remodeling Costs); Thomas Lane; 2022, R S Means Co Publisher, ISBN-10 (1955341699)</li> <li>• أ. د. سامي محمد فريج - موسوعة إدارة العقود الهندسية وعقود التشييد - الثلاث الأجزاء - الناشر: دار الرضا للنشر والتوزيع - مصر</li> <li>• الكود المصري لإدارة مشروعات التشييد كود رقم 311 - 2009 - وزارة الاسكان والمرافق والتنمية العمرانية - المركز القومي لبحوث الاسكان</li> </ul> |
|                                                                  | <b>Electronic Sources</b><br>(Links must be added)                                                                  | <ul style="list-style-type: none"> <li>• Construction Equipment Association (CEA); <a href="https://thecea.org.uk">https://thecea.org.uk</a> (2008-now)</li> <li>• Construction Management Association of America; <a href="https://www.cmaanet.org/">https://www.cmaanet.org/</a> (1982-now)</li> <li>• Project Management Institute; <a href="https://www.pmi.org/">https://www.pmi.org/</a> (1969- now)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|                                                                          |                                                    |                                                                                                                   |
|--------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|                                                                          |                                                    | • American Society of Civil Engineers;<br><a href="https://www.Asce.org/">https://www.Asce.org/</a> (1852 to now) |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added) | EKB - Microsoft office                                                                                            |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                         | Projector- White board- Personal Computer- Microsoft Team                                                         |
|                                                                          | <b>Supplies</b>                                    | Lecture notes                                                                                                     |
|                                                                          | <b>Electronic Programs</b>                         | --                                                                                                                |
|                                                                          | <b>Skill Labs/ Simulators</b>                      | --                                                                                                                |
|                                                                          | <b>Virtual Labs</b>                                | --                                                                                                                |
|                                                                          | <b>Other</b> (to be mentioned)                     | --                                                                                                                |

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|                  | <b>Course Coordinator</b>                                                         | <b>Program Coordinator</b>                                                         |
|------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Name</b>      | <b>Dr. Asmaa Ahmed Soliman</b>                                                    | <b>Dr. Ghada Nashaat Mohamed</b>                                                   |
| <b>Signature</b> |  |  |

|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| المعهد التكنولوجي العالي - بالعاشر من رمضان |  |
| توصيف مقرر دراسي                            |                                                                                     |

## 1- معلومات أساسية :

|                            |             |      |      |                                                                 |
|----------------------------|-------------|------|------|-----------------------------------------------------------------|
| مبادئ التفاوض              |             |      |      | اسم المقرر: (تبعاً لما ورد باللائحة)                            |
| HUM 204                    |             |      |      | كود المقرر: (تبعاً لما ورد باللائحة)                            |
| العلوم الأساسية            |             |      |      | القسم/الأقسام العلمية التي شاركت في التدريس:                    |
| إجمالي                     | أخرى (تحدد) | عملي | نظري | إجمالي عدد الساعات المعتمدة للمقرر:<br>(تبعاً لما ورد باللائحة) |
| 2                          |             |      | 2    |                                                                 |
| اجباري                     |             |      |      | نوع المقرر:                                                     |
| SENIOR 2                   |             |      |      | المستوى الدراسي الذي قدم فيه المقرر:                            |
| البرامج الهندسية           |             |      |      | البرنامج الأكاديمي:                                             |
| المعهد التكنولوجي العالي   |             |      |      | المعهد:                                                         |
| د/ سلوى محمد عبد المحسن    |             |      |      | اسم منسق المقرر:                                                |
| مجلس القسم العلمي للبرنامج |             |      |      | جهة مناقشة واعتماد تقرير المقرر:                                |
| 7/26/2025                  |             |      |      | تاريخ اعتماد تقرير المقرر:                                      |

## 2- الوصف العام للمقرر (ملخص موجز للمحتوى العلمي) :

يهدف المقرر إلى تزويد الطالب بالمعرفة الحديثة حول مفهوم وطبيعة المبادئ وخصائص التفاوض الفعال، وكذلك استراتيجياته وتكتيكاته المختلفة، وتنمية مهارات الطالب الخاصة بالإعداد الجيد للتفاوض وممارسته في المجالات المختلفة في منظمات المعاصرة. ويتناول المقرر الموضوعات التالية: مفهوم وخصائص ومبادئ التفاوض – الطبيعة الديناميكية للتفاوض – العلاقات الاعتمادية – أخلاقيات التفاوض – الجوانب النفسية والاجتماعية للتفاوض الجيد – التفاوض التعاوني والتفاوض التنافسي – الإعداد الجيد للتفاوض – استراتيجيات وتكتيكات التفاوض – الجوانب التنظيمية للجلسة التفاوضية – النفوذ والتأثير في التفاوض – استخدام الأسئلة والرد علي الاعتراضات – التعامل مع المواقف الصعبة وحالات فشل التفاوض – أفضل الممارسات في التفاوض (حالات عملية).



### 3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

| نواتج التعلم للمقرر                                          |       | مخرجات البرنامج / المعايير الأكاديمية المتبناة<br>(التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)                                                                                                                                                        |       |
|--------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| عند الانتهاء من المقرر سيكون الطالب قادراً على               |       | (A3, A4, A5, A7, A8)                                                                                                                                                                                                                                           |       |
| النص                                                         | الكود | النص                                                                                                                                                                                                                                                           | الكود |
| يفهم أهمية التفاوض                                           | LO1   | تطبيق عمليات التصميم الهندسي لانتاج حلول فعالة من حيث التكلفة تلبي الاحتياجات المحددة مع مراعات الجوانب العالمية والثقافية والاجتماعية والاقتصادية والبيئية والأخلاقية وغيرها من الجوانب حسب الاقتضاء للانضباط وضمن مبادئ وسياقات التصميم والتنمية المستدامين. | A3    |
| يتعرف على مبادئ واسس التفاوض                                 | LO2   |                                                                                                                                                                                                                                                                |       |
| اكتساب مهارات الحوار والنقاش البناء                          | LO3   |                                                                                                                                                                                                                                                                |       |
| اكتساب مهارات المعرفة من خلال الانترنت                       | LO4   | الاستفادة من التقنيات المعاصرة وقواعد الممارسة والمعايير وإرشادات الجودة ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.                                                                                                                        | A4    |
| اكتساب مهارات التواصل الجيد مع الآخرين                       | LO5   |                                                                                                                                                                                                                                                                |       |
| اكتساب مهارات العمل مع فريق                                  | LO6   |                                                                                                                                                                                                                                                                |       |
| التعاون والتعامل مع الآخرين                                  | LO7   |                                                                                                                                                                                                                                                                |       |
| اكتساب مهارات التواصل الجيد مع الآخرين                       | LO8   | ممارسة تقنيات البحث وطرق التحقيق كجزء متأصل من التعلم.                                                                                                                                                                                                         | A5    |
| القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية | LO9   | العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعددة الثقافات.                                                                                                                                                                                                | A7    |
| القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية | LO10  | التواصل الفعال -بيانياً ولفظياً وخطياً - مع مجموعة من الجماهير باستخدام الأدوات المعاصرة.                                                                                                                                                                      | A8    |

### 4- طرق التعليم والتعلم للمقرر:

| التدريس المباشر           |  | التدريس الغير مباشر |                                      |                         |             |                         |                  |                  |                    |               |                | استراتيجيات التعلم بمساعدة تكنولوجيا المعلومات |                    |                   |                             |
|---------------------------|--|---------------------|--------------------------------------|-------------------------|-------------|-------------------------|------------------|------------------|--------------------|---------------|----------------|------------------------------------------------|--------------------|-------------------|-----------------------------|
| المحاضرات                 |  | العصف الذهني        | التعلم القائم على المشروعات الجماعية | استراتيجية دراسة الحالة | حل المشكلات | كتابة التقارير /الأبحاث | الحوار والمناقشة | التدريب الميداني | الزيارات الميدانية | التعلم الذاتي | التعلم باكتشاف | برامج المحاكاة أو النمذجة                      | المعامل الافتراضية | التعلم الالكتروني | النماء الإصطناعي في التعليم |
| التمارين العملية والتجارب |  |                     |                                      |                         |             |                         |                  |                  |                    |               |                |                                                |                    |                   |                             |

|   |  |  |   |  |   |   |   |  |  |   |   |  |  |   |   |
|---|--|--|---|--|---|---|---|--|--|---|---|--|--|---|---|
| √ |  |  | √ |  | √ | √ | √ |  |  | √ | √ |  |  | √ | √ |
|---|--|--|---|--|---|---|---|--|--|---|---|--|--|---|---|

### الجدول الدراسي للمقرر:

| رقم<br>الاسبوع<br>الدراسي | المحتوى العلمي للمقرر<br>(موضوعات المقرر) | إجمالي عدد<br>الساعات<br>الأسبوعية | عدد ساعات التعلم المتوقعة |       |        |
|---------------------------|-------------------------------------------|------------------------------------|---------------------------|-------|--------|
|                           |                                           |                                    | تدريس<br>نظري             | تدريب |        |
|                           |                                           |                                    |                           |       | تمارين |
| 1                         | تعريف بالمقرر الدراسي ومقدمة عامه         | 2                                  | 2                         | 0     | 0      |
| 2                         | أهمية التفاوض واهدافه                     | 2                                  | 2                         | 0     | 0      |
| 3                         | أنواع المفاوضات                           | 2                                  | 2                         | 0     | 0      |
| 4                         | العناصر الأساسية لعملية التفاوض           | 2                                  | 2                         | 0     | 0      |
| 5                         | مراحل العملية التفاوضية                   | 2                                  | 2                         | 0     | 0      |
| 6                         | إجراءات التفاوض                           | 2                                  | 2                         | 0     | 0      |
| 7                         | مراجعة وامتحان منتصف الفصل الدراسي        |                                    |                           |       |        |
| 8                         | مهارات التفاوض                            | 2                                  | 2                         | 0     | 0      |
| 9                         | مباريات التفاوض                           | 2                                  | 2                         | 0     | 0      |
| 10                        | استراتيجيات حل النزاع                     | 2                                  | 2                         | 0     | 0      |
| 11                        | خطوات عملية التفكير التفاوضي              | 2                                  | 2                         | 0     | 0      |
| 12                        | كيفية التفاوض بفاعلية                     | 2                                  | 2                         | 0     | 0      |
| 13                        | تكتيكات التفاوض                           | 2                                  | 2                         | 0     | 0      |
| 14                        | مراجعة عامة                               | 2                                  | 2                         | 0     | 0      |
| 16-15                     | إختبارات الفصل الدراسي النهائية           |                                    |                           |       |        |

### 5- طرق تقييم الطلاب:

| م | طرق التقييم *                                | توقيت التقييم المتوقع<br>(رقم الأسبوع<br>الدراسي) | درجات التقييم | النسبة المئوية<br>من إجمالي درجة المقرر |
|---|----------------------------------------------|---------------------------------------------------|---------------|-----------------------------------------|
| 1 | امتحان 1 تحريري (أعمال سنة)                  | 3                                                 | 10            | 10 %                                    |
| 2 | امتحان 2 تحريري (أعمال سنة)                  | 10                                                | 10            | 10 %                                    |
| 3 | امتحان منتصف الفصل الدراسي                   | 7                                                 | 20            | 20 %                                    |
| 4 | امتحان نهائي تحريري                          | 15 و 16                                           | 40            | 40 %                                    |
| 5 | تكاليفات / مشروع / ملف الإنجاز /كتيب الأنشطة | طوال الفصل                                        | 20            | 20 %                                    |

6- مصادر التعلم والتسهيلات المادية:

| منسق المقرر                                                                        | منسق البرنامج                                                                     |         |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------|
| د/ سلوي محمد عبد المحسن                                                            | إ.د/ أحمد عبد الغفار                                                              | الإسم   |
|  |  | التوقيع |

|                                                                         |                                                                                     |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Higher Technological Institute (HTI) – 10 <sup>th</sup> of Ramadan City |  |
| <b>Course Specification</b>                                             |                                                                                     |

### **1. Basic information:**

|                                                                                                                 |                                           |                  |                        |              |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------------------|--------------|
| <b>Course Title</b> (according to the bylaw):                                                                   | <b>Field Training (4)</b>                 |                  |                        |              |
| <b>Course Code</b> (according to the bylaw):                                                                    | <b>FTR 261</b>                            |                  |                        |              |
| <b>Department/s that participated in the teaching:</b>                                                          | Civil Engineering                         |                  |                        |              |
| <b>Total number of credit hours of the course:</b><br>(according to the bylaw)                                  | <b>Theoretical</b>                        | <b>Practical</b> | <b>Other (specify)</b> | <b>Total</b> |
|                                                                                                                 | --                                        | 18               |                        | 18           |
| <b>Course Type:</b>                                                                                             | Compulsory                                |                  |                        |              |
| <b>The level to which the course was introduced:</b>                                                            | <b>SENIOR 2</b>                           |                  |                        |              |
| <b>Academic Program:</b>                                                                                        | Civil Engineering                         |                  |                        |              |
| <b>Institute:</b>                                                                                               | <b>Higher Technological Institute</b>     |                  |                        |              |
| <b>Name of Course Coordinator:</b>                                                                              | Dr. Ahmed abd Ellatief                    |                  |                        |              |
| <b>Course Specification Approval</b><br>(Attach the decision/minutes of the department /committee/council ....) | The division council minute of department |                  |                        |              |
| <b>Course Specification Approval Date:</b>                                                                      | مجلس قسم شهر أغسطس                        |                  |                        |              |

### **2. Course Overview (Brief summary of scientific content):**

The student shall be trained to execute the following: Prepare design calculation sheets; Prepare design drawings and working details to be used on site; Prepare all notes related to the works to guarantee the execution of all works according to project specifications.

### **3. Course Learning Outcomes CLOs :**

**Matrix of course learning outcomes CLOs with program outcomes POs (NARS).**

| <b>Program Outcomes (NARS)</b><br>(according to the matrix in the program specs) |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Course Learning Outcomes</b>                                    |                                                                                                  |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>A2, A9, B1</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Upon completion of the course, the student will be able to:</b> |                                                                                                  |
| <b>Code</b>                                                                      | <b>Text</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Code</b>                                                        | <b>Text</b>                                                                                      |
| <b>A2</b>                                                                        | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.                                                                                                                                                                                           | <b>LO1</b>                                                         | Applies a full range of civil engineering's concept and techniques by construction methods .     |
| <b>A9</b>                                                                        | Use creative innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.                                                                                                                                                                                                                                                                | <b>LO2</b>                                                         | Sketches the design papers for construction's details.                                           |
| <b>B1</b>                                                                        | Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics. | <b>LO3</b>                                                         | Designs the arithmetic observations of all elements of the structure.                            |
|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                             | <b>LO4</b>                                                         | Follows up the project data to ensure the progress of work according to the specifications set.. |

### **4. Course Teaching and Learning Methods:**

| Direct Instruction |                      | Indirect Instruction |                        |            |                       |                    |            |                |            |               |                    | Information Technology-Assisted Learning |              |            |                 |
|--------------------|----------------------|----------------------|------------------------|------------|-----------------------|--------------------|------------|----------------|------------|---------------|--------------------|------------------------------------------|--------------|------------|-----------------|
| Lectures           | Tutorial / Practical | Brain Storming       | Project based learning | Case Study | Problem Base Learning | Reports & Research | Discussion | Field Training | Site Visit | Self-Learning | Discovery Learning | Simulation Programs                      | Virtual labs | E-Learning | AI in Education |
|                    |                      |                      |                        |            |                       |                    |            | √              | √          | √             |                    |                                          |              |            |                 |

### Course Schedule:

| Week No. | Scientific content of the course<br>(Course Topics)                                        | Total Weekly Hours | Expected number of the Learning Hours |          |                 |
|----------|--------------------------------------------------------------------------------------------|--------------------|---------------------------------------|----------|-----------------|
|          |                                                                                            |                    | Theoretical teaching<br>(lectures)    | Training |                 |
|          |                                                                                            |                    |                                       | Tutorial | Practical / Lab |
| 1        | Preparing the design arithmetic note.                                                      | 18                 | --                                    | --       | 18              |
| 2        | Preparing the executive design maps with the work of the various construction details.     | 18                 | --                                    | --       | 18              |
| 3        | Revision and Mid Exam                                                                      |                    |                                       |          |                 |
| 4        | Prepare design drawings and working details to be used on site.                            | 18                 | --                                    | --       | 18              |
| 5        | Preparing all the project data to ensure the workflow according to the specifications set. | 18                 | --                                    | --       | 18              |
| 6        | Final Exam.                                                                                |                    |                                       |          |                 |

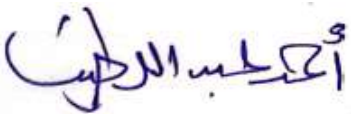
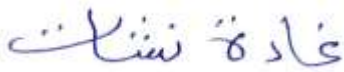
### 5- Methods of students' assessment:

| No. | Assessment Methods * | Assessment Timing | Marks/ Scores | Percentage of |
|-----|----------------------|-------------------|---------------|---------------|
|-----|----------------------|-------------------|---------------|---------------|

|   |                                           | (Week Number) |    | total course Marks |
|---|-------------------------------------------|---------------|----|--------------------|
| 1 | Exam 1 written (Semester work)            | --            | -- | --                 |
| 2 | Exam 2 written (Semester work)            | --            | -- | --                 |
| 3 | Midterm exam                              | 3             | 20 | 20 %               |
| 4 | Final Written Exam                        | --            | -- | --                 |
| 5 | Final Practical/Clinical/... Exam         | --            | -- | --                 |
| 6 | Final Oral Exam                           | 6             | 30 | 30%                |
| 7 | Assignments / Project /Portfolio/ Logbook | 5             | 25 | 25 %               |
| 8 | Field training                            | Weekly        | 25 | 25%                |

### 6- Learning Resources and Supportive Facilities \*

|                                                                          |                                                                                                                     |                             |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Learning resources (books, scientific references, etc.) *</b>         | <b>The main (essential) reference</b><br>(must be written in full according to the scientific documentation method) | • -----                     |
|                                                                          | <b>Other References</b>                                                                                             | • -----                     |
|                                                                          | <b>Electronic Sources</b><br>(Links must be added)                                                                  | • -----                     |
|                                                                          | <b>Learning Platforms</b><br>(Links must be added)                                                                  | EKB - Microsoft office      |
| <b>Supportive facilities &amp; equipment for teaching and learning *</b> | <b>Devices/Instruments</b>                                                                                          |                             |
|                                                                          | <b>Supplies</b>                                                                                                     |                             |
|                                                                          | <b>Electronic Programs</b>                                                                                          | Auto cade – SAP 2000 - ETAB |
|                                                                          | <b>Skill Labs/ Simulators</b>                                                                                       |                             |
|                                                                          | <b>Virtual Labs</b>                                                                                                 |                             |
|                                                                          | <b>Other (to be mentioned)</b>                                                                                      |                             |

|                  | Course Coordinator                                                                  | Program Coordinator                                                                  |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Name</b>      | Dr. Ahmed abd Ellatief                                                              | Dr. Ghada Nashaat Mohamed                                                            |
| <b>Signature</b> |  |  |