

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Management			
Course Code (according to the bylaw):	MNG 111			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	1	-	2
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Sara Gamal			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Introduction to modern management, principle, nature, technique of management, functions of Manager, function of management. **Planning:** concept, nature types of plans, plan objectives, nature of objectives, MBO. **Organizing:** logic, types and span of organizing, basic department. **Staffing:** line/ staff authority, delegation of authority, centralization and decentralization, the communities. **Leading:** motivation,

communication types of leadership. **Controlling**: concept, types, objectives of control, the deviation, reasons and corrective action, effective control.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A6, A7, 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.	LO1	Describe the fundamental management functions, including planning, organizing, leading, and controlling.
		LO2	Compare common organizational structures and their characteristics.
		LO3	Explain performance assessment methods and their practical applications.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO4	Demonstrate teamwork skills in achieving organizational goals.
		LO5	Analyze the role of interpersonal communication and identify common causes of miscommunication.
		LO6	Collaborate effectively within diverse teams to achieve shared objectives.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO7	Apply principles of leadership, motivation, and performance management in workplace scenarios.
		LO8	Evaluate employee appraisal and compensation systems for organizational improvement.

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 Principles of Management	2	1	1	-
2	Managerial Planning and Goal Setting	2	1	1	-
3	Strategy Formulation and Execution	2	1	1	-
4	Strategy Formulation and Execution	2	1	1	-
5	Fundamentals of Organization Structure	2	1	1	-
6	Fundamentals of Organization Structure	2	1	1	-
7	Revision and Mid Exam				
8	Recruitment and Selection	2	1	1	-
9	Recruitment and Selection	2	1	1	-

10	Performance Appraisal	2	1	1	-
11	Motivation	2	1	1	-
12	Controlling	2	1	1	-
13	Controlling	2	1	1	-
14	Revision	2	1	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)	6	10	10%
2	Exam 2 written (Semester work or quiz)	9	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Portfolio/ Logbook	According to schedule	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)	Samuel C. Certo & S. Trevis Certo, "Modern Managements: Concept and Skills", Pearson International, 15 editions, 2019.
	Other References	-Richard L. Daft," Management" , Dryden press, 12 edition, 2016. -Course notes are available to the students at the copy center of the Institute and Microsoft teams.
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for	Devices/Instruments	N/A
	Supplies	N/A
	Electronic Programs	N/A
	Skill Labs/ Simulators	N/A

teaching and learning *	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Sara Gamal	Dr. Mohamed Ashraf
Signature	ساره جمال	محمد اشرف

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Mechanics (3)			
Course Code (according to the bylaw):	ENG 101			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	--	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Gamal Nada			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Kinematics of rigid bodies in plane motion: Translation motion, rotation about fixed axis and general plane motion - Geometrical properties of rigid body; center of gravity and mass moment of inertia - Kinetics of rigid body in translation, rotation and general plane motion (equation of motion based on Newton's second law, work, energy and momentum).

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1 & A3& 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 engineering fundamentals, basic science and mathematics.	LO1	Identify the different types of plane motion of rigid bodies (translation, rotation or general plane motion)
		LO2	Formulate the equations of kinematics of rotation motion of rigid body.
		LO3	Solve problems of kinematics of general plane motion of rigid body.
		LO4	Identify the geometrical properties of rigid bodies.
		LO5	Formulate the equations of kinetics of plane motion of rigid body.
		LO6	Solve problems of kinetics of plane motion of rigid body (translation, rotation, or general).
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.	LO7	Relate between the motions of the bodies to obtain the requirements for a certain dynamic design.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO8	Investigate the given system (mechanism) by applying the laws of solid mechanics, material properties and laws of dynamics.

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 the dynamics of rigid body. - Kinematics of rotation of rigid body.	4	2	2	---
2	- Motion of a point on a rotating rigid body. - Problems	4	2	2	---
3	- Problems, continued - Kinematics of general plane motion of rigid body	4	2	2	---
4	- Problems - Kinematics of general plane motion of rigid body, rolling without slipping (or without sliding)	4	2	2	---

5	- Kinematics of general plane motion of rigid body, rolling with slipping or with sliding - Problems	4	2	2	---
6	- Geometrical properties of rigid body: mass center of simple body - Mass center of composite body	4	2	2	----
7	Revision and Mid Exam				
8	- Mass moment of inertia for simple and composite body - Problems	4	2	2	--
9	- Kinetics of general plane motion of rigid body, General approach	4	2	2	--
10	- Kinetics of translation of rigid body - Problems	4	2	2	--
11	- Problems, continued - Kinetics of rotation of rigid body, centroidal rotation	4	2	2	--
12	- Problems - Kinetics of rotation of rigid body, non-centroidal rotation	4	2	2	--
13	- Problems - Kinetics of general plane motion of rigid body	4	2	2	--
14	- Problems - Revision	4	2	2	--
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)	5	10	10 %
2	Midterm exam	7	20	20 %
3	Exam 2 written (Semester work or quiz)	10	10	10 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Sheets	Through Semester	10	10 %
6	In-Class questions	Through Semester	10	10 %

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)	R. C. Hibbler "Engineering Mechanics: Dynamics", 15th Edition, Published by Pearson, 2021.
	Other References	-Andrew Pytel and Jaan Kitselas "Engineering Mechanics: Dynamics", 4 th Edition, Published by CL Engineering, 2016 -Course Notes available as softcopy on Microsoft teams
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Other (to be mentioned)	Library

	Course Coordinator	Program Coordinator
Name	Dr. Gamal Nada	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

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).

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A3, 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 engineering fundamentals, basic science, and mathematics.	LO1	Define the main items of the vectors, lines and planes in space.
		LO2	Describe the main concepts of vectors and integral operations.
		LO3	Explain coordinate systems and the principals of Jacobian transformation and double and triple integrations and surfaces in space.
A2	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.	LO4	Analyze the Green, Gauss, and Stokes theorems to evaluate the applications.
		LO5	Implement the skills of vectors to estimate some mathematical modeling.
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.	LO6	Analyze the life problem to create the mathematical problem.
		LO7	Classify the problems according to the suitable integral's method (line integral, surface integral and volume integral).
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO8	Describe and contrast between different lines and planes with sketching solids and planes
		LO9	Evaluate and assess the suitable method of the double and triple integrals in cylindrical and spherical coordinates.
		LO10	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Green theorem	4	2	2	0
13	Gauss theorem	4	2	2	0
14	Stokes theorem	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 1written (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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	1- Erwin Kreyszig, Advanced Engineering Mathematics,Tenth Edition, JOHN WILEY & SONS, INC.
	Other References	1- Erwin Kreyszig, Advanced Engineering Mathematics 2- Advanced Calculus Theory and Practice, John Petrovic 2020 3- Advanced Calculus Fundamentals of Mathematics, Carlos Polanco 4- Advanced Engineering Mathematics by H. K. Dass. 5- Advanced Engineering Mathematics by K. A. Stroud and J. Booth, Fourth Ddition.

		6- Calculus III Jerald Marsden and Alan Weinstein, Springer-Verlag 1985, Second Edition.
	Electronic Sources (Links must be added)	• https://math.fandom.com/wiki/Hypermathematics • https://github.com/AlexCharlton/hypermath • https://www.britannica.com/science/mathematics • https://www.khanacademy.org/math • https://animated-mathematics.net/
	Learning Platforms (Links must be added)	EKB- Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	MATLAB
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

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

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Materials Science & Engineering			
Course Code (according to the bylaw):	ENG 114			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof. Dr. Manal Amin			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Atomic structure of materials, X-ray diffraction, crystallography, solidification, crystalline imperfections, diffusion, theory of alloys, binary and ternary alloys, iron carbon diagram, TTT diagrams, heat treatments, deformations and the Strain hardening, mechanical properties of metals, physical properties of materials, corrosion and wear.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A5 & A7, 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 atomic structures, crystalline forms, and imperfections of engineering materials.
		LO2	Analyze the behavior of engineering materials under mechanical and thermal loading.
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	Interpret X-ray diffraction data of crystalline materials.
		LO4	Measure diffusion rates in engineering alloys.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO5	Investigate the relationship between atomic structures and material properties.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO6	Collaborate with peers to assess crystalline imperfections and microstructural changes.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO7	Solve numerical problems related to binary, ternary, and iron-carbon phase diagrams.
		LO8	Evaluate phase transformations and heat treatments using TTT diagrams.

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 mechanical properties of metals and physical properties of materials.	4	2	2	
2	Interatomic Bonding	4	2	2	
3	Atomic structure (Atomic structure of matter).	4	2	2	
4	Atomic structure (Atomic structure of matter).	4	2	2	
5	Atomic structure (crystallography)	4	2	2	
6	Atomic structure (X-ray diffraction).	4	2	2	
7	Revision and Mid Exam				

8	Diffusion in engineering Materials.	4	2	2	
9	Crystalline imperfections.	4	2	2	
10	Solidification of metallic Materials	4	2	2	
11	Phase Diagram (theory of alloys, binary and ternary alloys.	4	2	2	
12	Phase Diagrams, iron carbon diagram.	4	2	2	
13	TTT diagrams, heat treatments, deformation and strain hardening.	4	2	2	
14	Corrosion and Wear	4	2	2	
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)	6	10	10 %
2	Exam 2 written (Semester work or quiz)	9	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Portfolio/ Logbook	Monthly	10	10 %
	Technical Research paper	12	10	10 %

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)	-Callister, William D. Materials Science and Engineering: An Introduction. John Wiley & Sons Australia, Ltd, 2021.
	Other References	-William D. Callister, Jr. —Materials science and engineering – An introduction"; John-Wiley, Seventh Edition, 2006. -William F. Smith, "Principles of materials science and engineering "; McGraw-Hill, Third Edition, 1996.

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop.- Optical Microscope-Polishing device -Heat treatment furnace-Wear device
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NON
	Virtual Labs	NON
	Other (to be mentioned)	NON

	Course Coordinator	Program Coordinator
Name	Assoc. Prof. Dr. Manal Amin	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Communication & Presentation Skills			
Course Code (according to the bylaw):	HUM 108			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	2	-	3
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	DR. Ashraf selim			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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 objections – Evaluating presentation performance.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (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	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO1	formulate e interpersonal Communication
		LO2	embody languages communication
		LO3	Learn types of managerial and interpersonal communications
		LO4	Identify the main items of the of Communication technology
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO5	Define the main items of the of of Presentation Skills
		LO6	presentation techniques in performance and dealing with others inside organization

A10	Acquire and apply new knowledge and practice self, lifelong and other learning strategies.	LO7	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Revision and Mid Exam				
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	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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	HTI; Available Hard copy . Available Presentation (handed to students' part by part)
	Other References	• -Henderson, Fiona, & Parkes, Geoff. (2023). "Improving Presentation Skills in Higher Education: A Case Study." Journal of Further and Higher Education, 47(2), 184-196 • -Graveline, Denise. (2023). "The Science of Effective Communication." Harvard Business Review, 101(3), 80-87.”. • Gallo, Carmine. (2022). Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Minds. St. Martin's Griffin • Henderson, Fiona, & Parkes, Geoff. (2022). "Improving Presentation Skills in Higher Education: A Case Study." Journal of Further and Higher Education, 45(4), 510-523. • Graveline, Denise. (2022). "The Science of Effective Communication." Harvard Business Review, 99(5), 92-99. • Lesikar, Raymond V and Marie E. Flatley. Basic Business Communication: Skills for Empowering the Internet Generation: Ninth Edition. New Delhi: Tata McGraw-Hill, 2022. • Gallo, Carmine. (2022). Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Mind • 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) • "Speaking with Strategic Impact: Reach, Connect, and Lead" by Kate Leavell (2023) • "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)
	Electronic Sources (Links must be added)	https://cadreworks.org/resources/communication-skills
	Learning Platforms (Links must be added)	EKB - Microsoft office
	Devices/Instruments	Notebook and data show

Supportive facilities & equipment for teaching and learning *	Supplies	data show equipped lecture room
	Electronic Programs	Microsoft power point

	Course Coordinator	Program Coordinator
Name	DR.Ashraf selim	PROF. Ahmed Abd El-Gafar
Signature	Ashraf selim	أحمد عبد الغفار

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Thermodynamics (1)			
Course Code (according to the bylaw):	MEC 111			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Asso. Prof. Dr. Amr Hassaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Covers the fundamentals of thermodynamics; thermodynamic properties - Properties of pure substances and gas laws (equation law of state for ideal gases, tables and charts for pure substances) - The zeros law of thermodynamics - Processes and different types of processes - The first law of thermodynamics for closed Covers the fundamentals of thermodynamics; thermodynamic properties - Properties of pure substances and gas laws

(equation law of state for ideal gases, tables and charts for pure substances) - The zeros law of thermodynamics - Processes and different types of processes - The first law of thermodynamics for closed.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B1, B2)		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 main concepts and principles of thermodynamics.
		LO2	Solve various thermodynamics problems by applying thermodynamics laws.
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 thermodynamics fundamentals to the preliminary design of mechanical processes and energy systems.
		LO4	Execute primary process and systems design based on the Conservation of Energy Principle.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics, and Vibrations.	LO5	Interpret the effect of pure substance properties on the characteristics of various systems and processes.
		LO6	Analyse different types of systems utilizing the first law of thermodynamics.
		LO7	Relates the efficiencies of heat engines and COPs of refrigerators and heat pumps with the aid of the second law of thermodynamics.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using	LO8	Manage energy interactions between coupled thermodynamic systems to optimize system performance.

	appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO9	Carry out the basic design analysis of real systems on the aspect of comparison with ideal thermodynamic 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical / Lab
1	Introduction to Thermodynamics + Basic Information and Definitions	4	2	2	-
2	Main Concepts + Boundary work and Quasi-equilibrium process	4	2	2	-
3	Pure Substances + Ideal gases	4	2	2	-
4	Equation of state and property tables + Energy Balance and the First Law of Thermodynamics	4	2	2	-
5	Closed systems + First law of thermodynamics for closed systems	4	2	2	-
6	First law of thermodynamics for closed systems	4	2	2	-
7	Revision and Mid Exam				

8	Mass and volume flow rates + Quiz 1	4	2	2	-
9	The Energy of a Flowing Fluid (Flow work or Flow Energy + Analysis of open systems	4	2	2	-
10	First law of thermodynamics for open systems+ Quiz 2	4	2	2	-
11	Second law of Thermodynamics + Reversible and Irreversible process	4	2	2	-
12	Heat Engines, Refrigerators, and Heat pumps	4	2	2	-
13	Carnot cycle	4	2	2	-
14	Thermal Efficiency and Coefficient of Performance (COP)	4	2	2	-
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)	8	10	10 %
2	Exam 2 written (Semester work or quiz)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments	3-14	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)	Cengel, Yunus A., and Michael A. Boles. "Thermodynamics: An Engineering Approach Ninth Edition." (2019).
	Other References	Kanoglu, Mehmet. "Thermodynamics: An Engineering Approach 8th Edition in SI Units." (2015).
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
	Devices/Instruments	Data-show and Laptop

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

	Course Coordinator	Program Coordinator
Name	Associate Prof. Amr Hassaan	Dr. Mohamed Ashraf
Signature		

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:
إجمالي	أخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1		1	2	
اجباري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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 (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 الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
1	2	3	4	5
1	جسم الانسان (عظمى - عضلى - مفصلى - عصبى) وما هو تأثير ممارسات المشاركة الرياضية + نشاط رياضي	2	1	0
2	تعريف الاصابة- اسبابها -اعراضها - الاسعافات الاولى ومبادئها+ نشاط رياضي	2	1	0
3	اهداف واعراض الاسعافات الاولى والوسائل المستخدمة فى الاسعافات الاولى + نشاط رياضي	2	1	0
4	اصابات الجلد (الجروح - الحروق - كدمات الجلد) + نشاط رياضي	2	1	0
5	اصابات العضلات (الاجهاد العضلى - التقلص العضلى - التمزق العضلى) + نشاط رياضي	2	1	0
6	مراجعته عامه + تدريب على التقييم العملي	2	1	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	مراجعته عامه + مناقشه ابحاث	2	1	0
9	اصابات الجهاز العصبى (الاغماء- الصدمة - كدمات الاعصاب -النزيف) + تقييم الجزء العملي	2	1	0
10	ماهى القوام - تعريفه - مبادئ المحافظة على القوام + مناقشه الابحاث و التقارير	2	1	0
11	الانحرافات القوامية (انواعها - اسبابها	2	1	0
12	مراجعته عامه	2	1	0
13,14	إختبارات الفصل الدراسي النهائية عملي			

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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 (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
ابو العلا عبد الفتاح : الرياضه و انقاص الوزن ، دار الفكر العربي 2023	المراجع الأخرى	
الهام شلبي : بانورما الصحة العامه للرياضيين القاهرة 2022	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
قاعة محاضرات مجهزة والجيم	1	التجهيزات التعليمية المساندة للتعليم 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 :

مقدمة في تاريخ الحضارات				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 101				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	اخرى (تحديد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2	-	-	2	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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) :

يتناول المقرر: 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

الوسطي (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 (التي يحققها المقرر تبعاً للمصنوفة 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 ومصادر 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		
تعزز 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.	LO11		

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 الجامعية	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 الأسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)		إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
				تدريس نظري	تدريب
	عملي	تمارين			
1			2	2	0
2			2	2	0
3			2	2	0
4			2	2	0
5			2	2	0
6			2	2	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8			2	2	0
9			2	2	0
10			2	2	0
11			2	2	0
12			2	2	0
13			2	2	0
14			2	2	0
15-16	اختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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	15,16	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	خالد الشرييني ، مرفت ذكي: مقدمة في تاريخ الحضارات، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان، 2019
المراجع الأخرى	1- رمسيس رياض، جورج صليب: الحضارات القديمة، مصر والشرق. وكالة الصحافة العربية، 2020
المصادر الإلكترونية (لابد من إضافة الروابط)	1- https://ar.wikipedia.org/wiki 2- http://www.du.edu.eg/ 3- https://www.youtube.com/
المنصة التعليمية (لابد من إضافة الرابط)	https://www.ekb.eg/ar/home
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

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

تاريخ مصر الحديث				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 102				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: (تبعاً لما ورد باللائحة)
2	-	-	2	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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) :

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

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 الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
				تمارين
1	أهمية دراسة التاريخ وخطة الدراسة.	2	2	0
2	الاحتلال العثماني ومساوئه.	2	2	0
3	الغزو الفرنسي وتصدي الشعب له.	2	2	0
4	دور محمد علي في بناء الدولة الحديثة.	2	2	0
5	خلفاء محمد علي وإبراز دور الخيو اسماعيل.	2	2	0
6	احتلال بريطانيا لمصر وسياستها الاستعمارية	2	2	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	دور الحركة الوطنية في التصدي للاحتلال. (1)	2	2	0
9	دور الحركة الوطنية في التصدي للاحتلال. (2)	2	2	0
10	المظاهرات والثورات المناهضة للاحتلال وخاصة ثورة 1919 ونتاجها.	2	2	0
11	نذر الحرب العالمية الثانية ومعاهدة 1936 والعدوان الثلاثي.	2	2	0
12	الأحداث التي مهدت لثورة 23 يوليو 1952.	2	2	0
13	تحليل أهداف ثورة 23 يوليو 1952.	2	2	0
14	مراجعة عامة	2	2	0
-15	اختبارات الفصل الدراسي النهائية			
16				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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	15,16	40	40%
5	امتحان نهائي عملي	لا يوجد	----	-----
6	امتحان نهائي شفهي	11	10	10%
7	تكاليفات / مشروع / ملف الإنجاز /كتيب الانشطة	8	10	10%
8	تدريب ميداني	لا يوجد	----	-----
9	أخرى (تذكر)	لا يوجد	-----	-----

6- مصادر التعلم والتسهيلات المادية:

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

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

الحضارة العربية والإسلامية				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 103				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: (تبعاً لما ورد باللائحة)
2	-	-	2	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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) :

يشمل المقرر: 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..... إلخ) - 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....إلخ.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصنوفة 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 و التأثر بأحداث الحضارة العربية والإسلامية و بين إنجازات و إخفاقات كل حقبة.	LO 2		
يربط بين التأثير و التأثر 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		
تعزز 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	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 الأسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)		إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
				تدريس نظري	
				تمارين	عملي
1	تعريف بالمقرر الدراسي ومقدمة عامه		2	2	0
2	أسس الحضارة الإسلامية : (القرآن والسنة – الأمة العربية – اللغة – الإطار الجغرافي – الشعوب المفتوحة – التأثيرات الأجنبية).		2	2	0
3	النظام السياسي : (الخلافة – الوزارة – الكتابة – الحجابة).		2	2	0
4	النظام الإداري : (الإدارات المحلية – دواوين الجند والخراج والرسائل والبريد إلخ).		2	2	0
5	النظام المالي : (موارد بيت المال – النفقات – السكة)		2	2	0
6	النظم العسكرية : (الجيش والأسطول : تكوينه وأسلحته وأساليبه)		2	2	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	التعليم والثقافة : (العلوم الشرعية "علم الكلام والفقه" – العلوم العقلية)		2	2	0
9	الفنون والآثار والعمارة.		2	2	0
10	القضاء والتقاضى .		2	2	0
11	المجتمع الإسلامي : (عناصره وأجناسه – الطوائف الدينية والمذهبية)		2	2	0
12	المجتمع الإسلامي، البناء الطبقي : الحكام والفقهاء والعلماء)		2	2	0
13	التجمل وأصحاب الحرف والصناعات..... إلخ		2	2	0
14	مراجعة عامة		2	2	0
16-15	اختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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	15,16	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 (الكتب والمراجع العلمية وغيرها) *
المرجع الأخرى	1- أحمد عبد الرازق، الحضارة الإسلامية في العصور الوسطى، القاهرة، 2004 . 2- غيداء عادل: دراسات في الحضارة العربية الإسلامية، المؤسسة العربية للدراسات والنشر، 2020. 3- سعيد عبد الفتاح عاشور وآخران: دراسات في تاريخ الحضار الإسلامية، دار المعرفة الجامعية، 2018. 4- شوقي أبو خليل: الحضارة العربية الإسلامية وموجز عن الحضارات السابقة، دار الفكر المعاصر، 2010
المصادر الالكترونية (لا بد من إضافة الروابط)	1- https://ar.wikipedia.org/wiki 2- http://www.du.edu.eg/ 3- https://www.youtube.com/
المنصة التعليمية (لا بد من إضافة الرابط)	https://www.ekb.eg/ar/home
الأجهزة	(داتا شو) وجهاز كمبيوتر محمول.
المستلزمات	قاعة محاضرات مجهزة
البرامج الالكترونية	-----
معامل المهارات/ المحاكيات	-----
المعامل الافتراضية	-----
أخرى (تذكر)	-----
	التجهيزات التعليمية المساندة للتعليم والتعلم *

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

التوقيع	وليد رضوان	الحسين الكفار

المعهد التكنولوجي العالي - بالعاشر من رمضان	
توصيف مقرر دراسي	

1- معلومات أساسية :

التذوق الأدبي				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 104				كود المقرر: (تبعاً لما ورد باللائحة)
العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	أخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2	-	-	2	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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) :

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

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	المعمل الافتراضية	التعلم الإلكتروني	الذكاء الاصطناعي في التعليم
√		√				√	√			√				√	

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس 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 (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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:

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

منسق المقرر	منسق البرنامج	
Prof. Eid Abd El-Baset Eid	أ.د. أحمد عبدالغفار	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:
إجمالي	أخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2	-	-	2	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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 للمحتوي العلمي) :

الاستماع لمجموعات الآلات الموسيقية الأوركستراية 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 موسيقي الجاز – دراسة الموسيقي العربية وألاتها – الإلمام الكامل بأنواع الموسيقي 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 – المهارات 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 (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
معرفة مجموعة الآلات الوترية	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.
التعرف علي أصوات مجموعات الآت النفخ الخشبي ومجموعات الآت النفخ النحاسي والتعرف علي الآلات الموسيقية من خلال الصور	LO2		

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 الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس 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 و امتحان 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 (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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 (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
عبد الحميد توفيق زكي: تاريخ المصريين: التذوق الموسيقي وتاريخ الموسيقى المصرية، الهيئة المصرية العامة للكتاب 2021.	المراجع الأخرى	
https://ar.wikipedia.org/wiki http://www.du.edu.eg/ https://www.youtube.com/watch?=bnCua19ME	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
قاعة محاضرات مجهزة	الأجهزة	التجهيزات التعليمية المساندة للتعليم 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	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 :

التراث الأدبي المصري				اسم المقرر: (تبعاً لما ورد باللائحة)
HUM 106				كود المقرر: (تبعاً لما ورد باللائحة)
قسم العلوم الأساسية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	أخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2	-	-	2	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
أ.د. أحمد عبدالغفار				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 مراحلته المختلفة 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 و الصياغة 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 (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 والخالقية وغيرها من الجوانب المتسقة مع النظام والظروف وضمن مبادئ وسياسات التصميم والتنمية التطوير المستدامين.	A3
يتعرف على أهم المؤثرات التي ساهمت في تكوين التراث الحضاري.	LO2		
يلخص مصادر ومكانة التراث الحضاري وتأثيره في مقومات بقاء وإستمرار الأمم وفقاً لدورها الريادي والحضاري.	LO3	الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.	A4
يستنتج الدور الحيوي والرئيسي للتراث الأدبي المصري..	LO4		
يربط بين التأثير والتأثر بين الحضارات القديمة والحديثة.	LO5		
يقارن بين الحضارة العربية الإسلامية والحضارات الحديثة ويربط بين محتويات المنهج والأحداث التي يمر بها عالمنا العربي الإسلامي .	LO6		
يؤمن بقيمة العلم والمعرفة و يثمن دور العقول العربية الإسلامية التي أبدعت في كافة الميادين.	LO7		
يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية في مجال التراث الحضاري.	LO8	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.	A5
يظهر مهارات إدارة الوقت بكفاءة في مجال أي مهنة ترتبط بالتراث الحضاري.	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 الذاتي .	LO10	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي 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 الأسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)		إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
				تدريس نظري	تدريب
عملية	تمارين	عملية	تمارين	عملية	تمارين
0	0	2	2	0	0
0	0	2	2	0	0
0	0	2	2	0	0
0	0	2	2	0	0
0	0	2	2	0	0
0	0	2	2	0	0
مراجعة وامتحان منتصف الفصل الدراسي				0	0
0	0	2	2	0	0
0	0	2	2	0	0
0	0	2	2	0	0
0	0	2	2	0	0
0	0	2	2	0	0
0	0	2	2	0	0
إختبارات الفصل الدراسي النهائية				0	0

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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 (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	كتاب المقرر ويتم تسليمه للطلاب في بداية الفصل
المراجع الأخرى	1- عوض مرسى الغلري، دراست في الألب المصري، الدار الدولية للاستثمارات الثقافية، القاهرة الطبعة الأولى، 2017 2- أحمد عبد الرازق، الحضارة الإسلامية في العصور الوسطى، القاهرة، 2020 . 3- عبد الرحمن بدوي: دور العرب في تكوين الفكر الأوربي. الهيئة المصرية العامة للكتاب 2021
المصادر الإلكترونية (لابد من إضافة الروابط)	https://ar.wikipedia.org/wiki http://www.du.edu.eg/ https://www.youtube.com/watch?bnCua19ME
المنصة التعليمية (لابد من إضافة الرابط)	EKB - Microsoft office
الأجهزة	قاعة محاضرات مجهزة
المستلزمات	Data show, White board
البرامج الإلكترونية	Microsoft Teams
معامل المهارات/ المحاكيات	-----
المعامل الافتراضية	-----
أخرى (تذكر)	-----
مصادر التعلم (الكتب والمراجع العلمية وغيرها) *	التجهيزات التعليمية المساندة للتعليم والتعلم *

منسق المقرر	منسق البرنامج	
أ.د. أحمد عبدالغفار	أ.د. أحمد عبدالغفار	الإسم
		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: (تبعاً لما ورد باللائحة)
2	-	-	2	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
أ.د. أحمد عبدالغفار				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 التنويع 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 والمثاليين) - 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 شاكرا) - 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 (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 الفنون الحديثة المعاصرة خاصة (الإبداع الرسومي)	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 وسياسات التصميم والتنمية التطوير المستدامين.	A3
يتعرف على أهم المؤثرات التي ساهمت في إظهار الأعمال الفنية للرسامين العالميين .	LO2		
يلخص مصادر ومكانة الأعمال الفنية للرسامين في أوروبا القديمة والمعاصرة	LO3	الاستفادة من التقنيات المعاصرة، والممارسات والمعايير، وإرشادات الجودة، ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.	A4
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 الفلسفات القديمة والمعاصرة في الأعمال الفنية.	LO6		
يثمن قيمة العلم والمعرفة و يثمن دور العقول المصرية التي أبدعت في كافة الميادين.	LO7	ممارسة تقنيات البحث وأساليب التحقيق كجزء لا يتجزأ من التعلم.	A5
يستخدم تكنولوجيا المعلومات بما يخدم الممارسة المهنية في مجال الفنون.	LO8		
يظهر مهارات إدارة الوقت بكفاءة في مجال أى مهنة ترتبط بالفنون .	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 الذاتي .	LO10	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.	A10

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 الجماعية	العصف الذهني	التمارين العملية والتجارب	المحاضرات
	✓				✓			✓	✓				✓		✓

الجدول الدراسي للمقرر:

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

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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:

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

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

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Production Technology 1			
Course Code (according to the bylaw):	ENG 121			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Abdou Abdallah Hassan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

By the end of this course the student must be taught:

Metal cutting theory (cutting tool geometry, chip formation, cutting forces and power, temperature in cutting, cutting fluids, cutting tool materials, machinability, cutting conditions and cutting time. Machining processes, turning, shaping, milling, drilling,

reaming, broaching, tapping, Abrasive machines, NC and CNC machines). Welding, welding-joint design, weldability, gas welding, arc welding , welding quality and testing, brazing, soldering, welding testing. Adhesive bonding, Mechanical fastening.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A7, A10 & 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 various types of machining and welding processes used in manufacturing systems
		LO2	Compare different manufacturing methods in terms of process characteristics and applications
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO3	Analyze the role of forces, heat, and tool geometry in metal cutting and their effect on machining performance
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO4	Select suitable manufacturing methods for different production scenarios
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Evaluate common welding defects using appropriate testing methods for weld quality assurance
		LO6	Design basic injection molds for plastic manufacturing

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 machining	4	2	1	1
2	Introduction to machining	4	2	1	1
3	Traditional methods of machining	4	2	1	1
4	Milling and grinding	4	2	1	1
5	Broaching and drilling	4	2	1	1
6	Non-traditional method of machining; EDM	4	2	1	1
7	Revision and Mid Exam				
8	Non-traditional method of machining Laser and water jet	4	2	1	1
9	Introduction to welding	4	2	1	1
10	Welding processes	4	2	1	1
11	Welding processes	4	2	1	1

12	New methods of welding; PAW	4	2	1	1
13	Welding defects and testing	4	2	1	1
14	Plastic processing Revision	4	2	1	1
15,16	Final Exam.				

Experiment Topics: (If any)

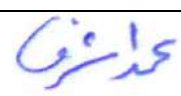
Serial	Experiment
1	Machining workshop (turning, and shaping)
2	Machining workshop (milling and grinding)
3	Machining workshop (broaching and drilling)
4	Non-traditional methods of machining (video lab.)
5	Non-traditional methods of machining (video lab.)
6	welding workshop (gas, spot and arc welding) PAW (video lab.)
7	Testing of welded joints (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 or quiz)	4	10	10 %
2	Exam 2 written (Semester work or quiz)	9	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam	13	10	10 %
6	Assignments / Project /Portfolio/ Logbook	6 & 10	10	10 %

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)	1- Groover, M. P. “Fundamentals of modern manufacturing: materials, processes, and systems“. John Wiley & Sons, 7 th edition (2019)
	Other References	1- S. Kalpakjian , “Manufacturing Processes for Engineering Materials”, Second Edition, ADISON-wisely Publishing Company USA, (2018). 2- H.S. Bana, “Workshop Technology”, Volume I and II , McGraw Hill , New York, (2015).
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Other (to be mentioned)	Machining and Welding Workshops

	Course Coordinator	Program Coordinator
Name	Dr Abdou Abdallah	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Computer Programming			
Course Code (according to the bylaw):	CSC 101			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	3	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Amal Nasser			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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 C++ language - How to write a complete program with high level language C++
- How to design, code, debug, and document program laboratory assignments - The syntax of writing any program by C++ language.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A2, A5, A9, A10		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	Describe the role of computer programming in solving mechanical engineering problems.
		LO2	Describe the basic syntax and structure of the C++ programming language
A5	Practice research techniques and methods of investigation as an inherent part of learning	LO 3	Design simple C++ programs for engineering-related applications.
		LO 4	Test C++ programs to ensure correct operation and performance.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO5	Document programming code with clarity and structure suitable for engineering practice.
		LO6	Apply structured programming techniques in laboratory tasks to simulate or solve mechanical problems.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies	LO7	Implement modern computing tools to write, compile, and execute C++ programs

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 computer language, flowcharts. Some examples. What is a computer program	4	1		3
2	Some examples on flowcharts. Creating simple program that print a message with high level programming language. The Simple C++ Data Type.	4	1		3
3	Writing a simple code for some elementary examples to create a complete program that accept input(s) and result outputs(s).	4	1		3
4	Writing a complete program that can perform	4	1		3

	any simple mathematical operations. Writing a simple code for some elementary examples				
5	Decisions: The if statement. The if – else statement. The select statement.	4	1		3
6	Loops: The For-Next loop. The DO and Loop Until. The do while loop	4	1		3
7	Revision and Mid Exam				
8	Examples on loop and Decisions	4	1		3
9	Revision	4	1		3
10	Matrices: Inserting an array. Inserting Matrices. How to print arrays. How to print matrices. Some examples on arrays and matrices	4	1		3
11	Methods: What do methods do? Calling a method. Some examples on methods.	4	1		3
12	Methods: What do methods do? Calling a method. Some examples on methods	4	1		3
13	Example on the overall course especially on function and procedure	4	1		3
14	Lab Exam	4	1		3
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Writing a C++ program to read and display user input
2	Using conditional statements (if - else)
3	Implementing loops (for - while) for repetitive tasks
4	Creating and using simple functions in C++

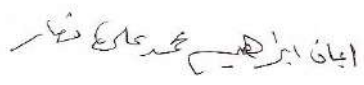
5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	2	10	10%
2	Exam 2 written (Semester work or quiz)	4	10	10%
3	Midterm exam	7	30	30 %
4	Final Written Exam	15	30	30 %
5	Final Practical/Clinical/... Exam	9	10	10%
6	Assignments	6	10	10%

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)	Stroustrup, B. (2019). <i>The C++ programming language</i> (4th ed.). Addison-Wesley
	Other References	N/A
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	• Personal computers or laptops with: • Minimum 4 GB RAM, dual-core processor • Operating system: Windows, Linux, or macOS • Data show (projectors) and smartboards for instructor demonstrations • External storage devices (USBs) for code backup and transfer • Networked printers for assignments and reports
	Supplies	• Printed lab manuals and C++ programming guides • Whiteboard markers and flowcharting sheets for algorithm planning • Lab logbooks or notebooks for manual recording of code outputs • Backup power supplies (UPS) and power extension cables

	Skill Labs/ Simulators	• Computer Programming Lab equipped with: • Individual student terminals or workstations • Real-time programming assignments and code execution practice • Simulated environments for: • Code tracing and logic building • Algorithm visualization tools (e.g., c++ Tutor)
	Virtual Labs	• Integrated Development Environments (IDEs): • Code::Blocks • Dev C++ • Microsoft Visual Studio • Eclipse CDT • Compilers: • GCC (GNU Compiler Collection) • Clang • Text Editors: • Notepad++ • Visual Studio Code • Version Control: • Git, GitHub Tools and performance profilers
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Amal Nasser	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Theory of Machines (1)			
Course Code (according to the bylaw):	ENG 122			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mohamed Elsayed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Mechanisms and machines. Linkage, mechanisms and structure. Miscellaneous mechanisms (Four bar -Slider crank- Scotch Yoke-Quick return).Coupling. Velocity and acceleration analysis. Computer-aided analysis of mechanisms. Cams (synthesis and analysis) – Gears & Gear trains.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B1, B2)		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 construction and function of basic mechanisms such as linkages, couplings, cams, and gears.
		LO2	Classify different types and shapes of mechanisms based on their motion characteristics.
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	Calculate the velocity and acceleration of links in mechanisms and determine the speed ratio in gear trains.
		LO 4	Analyze the functional effect of cam mechanisms in machine operation.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Evaluate the mechanical applications of various mechanisms using fundamental engineering principles.
		LO 6	Determine the equivalent motion or rate of cam systems.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using	LO7	Design cam profiles based on motion requirements using graphical or analytical methods.

appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO8	Design planetary gear systems using appropriate mechanical design principles.

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 (course description- basic definitions: link- mechanism- classification of kinematics pair- kinematics chain.)	4	2	2	-
2	General structure formula- Inversion of mechanism- Skelton.	4	2	2	-
3	Four bars mechanism: Grashof's criteria- Transmission	4	2	2	-
4	Four bars mechanism: Grashof's criteria- Transmission and deviation angles- Displacement	4	2	2	-
5	velocity and acceleration diagrams.	4	2	2	-

6	Slider crank mechanism: Displacement, velocity and acceleration diagrams.	4	2	2	-
7	Scotch Yoke Mechanism: Displacement, velocity and acceleration diagrams.	4	2	2	-
8	Revision and Mid Exam				
9	Quick Return Mechanism: Displacement, velocity and acceleration diagrams.	4	2	2	-
10	Couplings: Oldham Coupling, Universal Joint.	4	2	2	-
11	Cam Mechanism: Definitions and Classifications, Cam synthesis, Cam mechanism analysis.	4	2	2	-
12	Gears: Introduction, Fundamental law of gearing, Types of gears, Gear Trains (Ordinary – Planetary). Automotive transmission.	4	2	2	-
13	Introduction of fly wheel.	4	2	2	-
14	Solved problems	4	2	2	-
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)	9	10	10%
3	Exam 3 written (Semester work or quiz)	11	10	10%
4	Term Paper	12	10	10%
5	Midterm exam	8	20	20 %
6	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (must be written in full according to the scientific documentation method)	- A Textbook Of Theory Of Machine Dr. R K Bansal 2022 . - Theory of machines: Kinematics and Dynamics, B.V.R. Gupta, 2010

references, etc.) *		- Theory of machines 3rd, Rattan, McGraw- Hill, 2009. - Theory of Machines by THOMAS BEVAN, 3rd Edition 2009.
	Other References	- Mechanism Design: Enumeration of Kinematic Structures According to Function, Lung-Wen Tsai, CRC Press 2001 . - Mechanisms & Mechanical Devices Source Book, N. Sclater and N.P. Chironis, 3rd Edition, McGraw- Hill, 2001.
	Electronic Sources (Links must be added)	Microsoft teams
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	-----
	Other (to be mentioned)	-----

	Course Coordinator	Program Coordinator
Name	Dr. Mohamed Elsayed	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Material Testing			
Course Code (according to the bylaw):	ENG 124			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	3	-	3
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mohamed Ali			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Safety Instructions- Mechanical properties of metals, tensile, compression, bending, torsion, shear, hardness and impact tests. NON-destructive tests.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1 & A2 & A4 & B1 & B2)		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	<i>Identify</i> the key mechanical properties of engineering materials.
		LO2	<i>Formulate</i> solutions to material behavior problems using test data
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	<i>Conduct</i> mechanical tests using standard procedures
		LO4	<i>Analyze</i> test data and interpret material behavior.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	LO5	<i>Apply</i> safety guidelines and risk management practices in mechanical testing
		LO6	<i>Interpret</i> engineering standards and codes for destructive and NDT methods.
B1	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	LO7	<i>Use</i> mechanical testing equipment safely and effectively.
		LO8	<i>Implement</i> NDT techniques to evaluate internal material defects.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO9	<i>Select</i> appropriate materials for design based on test results.
		LO10	<i>Justify</i> design decisions using measured mechanical performance indicators.

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	Safety Instructions	3	0	1	2
2	Mechanical properties of metals	3	0	1	2
3	Tensile Test	3	0	1	2
4	Stress-Strain Diagram	3	0	1	2
5	Compression Test	3	0	1	2
6	Hardness Test	3	0	1	2
7	Revision and Mid Exam				
8	Hardness Test	3	0	1	2
9	Torsion and Shear Test	3	0	1	2

10	Bending Test	3	0	1	2
11	Impact Test	3	0	1	2
12	Non-Destructive Tests	3	0	1	2
13	Fatigue Test	3	0	1	2
14	Revision for part 2	3	0	1	2
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Tensile and Compression Tests
2	Hardness Test
3	Torsion and Shear Test
4	Impact Test
5	Bending Test
6	Non-Destructive Tests
7	Fatigue 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 or quiz)	6	5	5%
2	Exam 2 written (Semester work or quiz)	9	5	5%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Portfolio/ Logbook	According to the schedule.	30	30%

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)	Callister, William D. Materials Science and Engineering: An Introduction. John Wiley & Sons Australia, Ltd, 2021.
	Other References	William F. Smith, "Principles of materials science and engineering "; McGraw-Hill, Third Edition, 1996.
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Universal Testing Machine Hardness Tester- Impact Testing Machine - Torsion Testing Machine
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mohamed Ali	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Fluid Mechanics			
Course Code (according to the bylaw):	MEC 122			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Gamal Nada			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Covers fundamentals of fluid mechanics - Fluid properties - Basic laws of the static fluids – Force on flat surface – Force on curved surface - Buoyancy force – Archimede's principle – Stability of floating bodies - Relative equilibrium of fluids - Basic laws of fluid dynamics – Types of flows – Theory and applications of continuity, impulse-momentum, and Bernoulli equations –Introduction and types of fluid meters; pressure

measurements, velocity measurements and flow rate measurements - Energy equation for real flow - Fluid flow and energy losses in piping systems.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B1, B3)		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	Relate various fluid properties to the governing fluid mechanics equations.
		LO2	Identify the appropriate laws of fluid statics and dynamics for solving specific fluid mechanics problems.
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 fundamental equations to calculate and measure flow conditions such as pressure, velocity, and flow rate.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO4	Analyze fluid flow systems involving measurements and calculations of flow parameters.
B3	Select conventional mechanical equipment according to the required performance.	LO5	Select appropriate devices for measuring various flow parameters (e.g., pressure, flow rate).

		LO6	Design piping flow systems using appropriate methods based on flow requirements and constraints.

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 fluid mechanics, units and dimensions -Fluid properties	4	2	2	-
2	-Fluid properties, continued - Problems	4	2	2	-
3	-Fluid statics: Pressure at a point, pressure variation in a static fluid (Pascal's law) and hydrostatic law of pressure -Pressure measurements, manometers and pressure gages	4	2	2	-
4	- Problems - Forces on plane surface areas	4	2	2	-
5	- Problems - Forces on curved surfaces	4	2	2	-

6	- Problems - Buoyant force and stability of floating bodies	4	2	2	-
7	- Problems - Revision	4	2	2	-
8	Revision and Mid Exam				
9	-Fluid dynamics; Types of flow -Kinematics of flow, streamlines, and stream tube	4	2	2	-
10	-Flow velocities, accelerations and continuity equation -Problems	4	2	2	-
11	-Equation of motion along a streamline -Different forms of Bernoulli equation and its modification for real flow	4	2	2	-
12	- Problems -Application of Bernoulli equation in measurements of flow rate: orifice and Venturi meters	4	2	2	-
13	- Flow through pipes, friction and local losses for both laminar and turbulent flow - Problems	4	2	2	-
14	-Pipe connections (pipe networks) -Problems	4	2	2	-
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)	9	10	10%
3	Exam 3 written (Semester work or quiz)	11	10	10%
4	Term Paper	12	10	10%
5	Midterm exam	8	20	20 %
6	Final Written Exam	15, 16	40	40 %

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)	Robert W. Fox, Alan T. McDonald and John W. "Introduction to Fluid Mechanics", 10th Edition, Mitchell, 2020. Yunus A. Çengel and John M. Cimbala "Fluid Mechanics Fundamentals and Applications" 4 th Edition, Mcgraw-Hill, New York, 2018.
	Other References	Yunus A. Çengel, John M. Cimbala and Afshin J. Ghajar "Fundamentals of Thermal-Fluid Sciences" Sixth Edition, Mcgraw-Hill, New York, 2021.
	Electronic Sources (Links must be added)	Microsoft teams
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	-----
	Other (to be mentioned)	-----

	Course Coordinator	Program Coordinator
Name	Dr. Gamal Nada	Dr. Mohamed Ashraf
Signature		

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)
الهندسة المدنية				القسم/الأقسام العلمية التي شاركت في التدريس:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
2	1		3	
اختياري				نوع المقرر:
SOPHOMORE				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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 ، الجبر، الأسمنت والخرسانة ، التربة؛ إنشاء الأساسات ، الأسقف، السلالم، أغطية الأرضيات.

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

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

4 طرق التعليم والتعلم للمقرر:

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

الجدول الدراسي للمقرر:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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:

-الكود المصري لميكانيكا التربة، اللجنة الدائمة للكود المصري، مركز بحوث الإسكان والبناء، القاهرة، 2024 -الكود المصري لتصميم وتنفيذ المنشآت، اللجنة الدائمة للكود المصري، مركز بحوث الإسكان والبناء القاهرة، 2024	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
-الموسوعة الحديثة في تكنولوجيا تشييد المباني3م، فاروق عباس حيدر، منشأة المعارف، 2006 -موسوعة التنفيذ المعماري والانشائي، حسين محمد جمعة، اللجنة الدائمة، القاهرة، 2005	المراجع الأخرى	
https://books-library.website/files/download-pdf-ebooks.org-1544385031Kk6O6.pdf -الملحق الثاني للكود المصري	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office www.researchgate.net www.engineeringcivil.com http://ocw.mit.edu/ Microsoft Teams تشيد ترم الصيفي General	المنصة التعليمية (لابد من إضافة الرابط)	
سبورة بيضاء ب- جهاز عرض	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *

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

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Power Mechanical Engineering			
Course Code (according to the bylaw):	ENG 104			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	--	3
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Asso. Prof. Dr. Amr Hassaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

First Law of Thermodynamics - Energy conversion - Power cycles - principles of fluid mechanics – Prime movers (Gasoline & Diesel Engines) - Pumps & Turbines Principles of heat transfer - Simple steam plants - Refrigerators.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (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	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1	Identify common gauges used in fluid mechanics, such as barometers, manometers, Bourdon gauges, and flowmeters.
		LO2	Describe representative engineering problems and explain the working principles of relevant mechanical systems.
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.	LO3	Demonstrate the application of Bernoulli's equation and analyze the effect of a jet on a stationary plate.
		LO4	Analyze the physical properties and practical behavior of fluids through experimentation.
		LO5	Distinguish between various applications involving fluid machinery using fundamental fluid mechanics principles.
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.	LO6	Select the appropriate type of flowmeter based on application requirements.
		LO7	Apply fluid mechanics principles to the design of pressure vessels, such as circular cylinders and spheres, used in industry.
		LO8	Demonstrate logical, creative, and comparative thinking to solve unfamiliar 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	-Introduction to power mechanical engineering.	3	2	1	-
2	-Short summary of the basics.	3	2	1	-
3	-Heat energy and modes of heat transfer	3	2	1	-
4	Thermal expansion types	3	2	1	-
5	Describes fluid pressure, together with buoyancy and hydrostatic stability. Define Archimedes principles	3	2	1	-
6	Know gauges used in fluid mechanics, such as barometers, manometers.	3	2	1	-
7	Revision and Mid Exam				

8	Bourdon pressure and vacuum gauges.	3	2	1	-
9	Categories of flowmeters.	3	2	1	-
10	Demonstrates Bernoulli's equation and the impact of a jet on a stationary plate.	3	2	1	-
11	Identify relationships that exist between pressure, volume and temperature in a gas are given in a set of laws called the gas laws.	3	2	1	-
12	States the types of combustion engines and names the components of internal combustion engines.	3	2	1	-
13	Identify how the steam power plant works.	3	2	1	-
14	Basic refrigeration cycle.	3	2	1	-
15,16	Final Exam.				

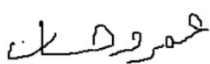
5- Methods of students' assessment:

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

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)	-Bird & Carl Ross , “ Mechanical Engineering Principles “ Routledge 4 th Ed., 2019.
	Other References	• B.R. Munson, D.F. Young, T.H. Okiishi, and W.W. Huebsch, Fundamentals of Fluid Mechanics, John Wiley and Sons Inc., 9th Ed., 2021. • R. E. Sonntag, C. Borgnakke and G. J. Van Wylen, Fundamentals of thermodynamics, John Wiley and sons Inc., 2009.

	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Associate Prof. Amr Hassaan	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Electronics Engineering			
Course Code (according to the bylaw):	EEC 102			
Department/s that participated in the teaching:	Electrical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	-	3
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Eslam Samy El-Mokadem			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/11/2025			

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

Revisions on: Semiconductor physics. P-n junction; I-V characteristics, Reverse saturation current depletion layer capacitance, Diffusion capacitance, Diode applications. half-and full- wave rectifier, Peak rectifier, Voltage doublers, Other two-

terminal devices; Zener diodes, Metal-semiconductor junction, heterojunction and Ohmic contacts, Schottky barrier diodes, Bipolar Junction transistor (BJT), Static and dynamics characteristics, Field effect transistors, JFET models and biasing, FET application; MOSFET principles of operation, MOSFET as a resistance. Verification of transistor Characteristics – Verification of different configurations of the transistor amplifiers (common emitter – common base – common collector)- Verification of MOSFET configuration and measuring the different parameters.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (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	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Solve PN junction, diode theory, and diode equivalent circuits to determine voltages and currents.
		LO2	Solve transistor parameters and perform DC analysis for transistor circuits.
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	Analyze the performance of half-wave and full-wave rectifiers in terms of efficiency and ripple factor.
		LO4	Construct clipping and clamping circuits using diodes and Zener diodes for wave shaping.

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	LO5	Design voltage regulator circuits using Zener diodes under different operating conditions.
		LO6	Design power supply circuits using rectifiers, filters, and regulators.

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	Semiconductor Materials	3	2	1	0
2	P.N Junction	3	2	1	0

3	Diode Theory	3	2	1	0
4	Diode circuits application (Half wave rectifiers)	3	2	1	0
5	Diode circuits application (Full wave rectifiers)	3	2	1	0
6	Diode circuits application (Clippers circuits)	3	2	1	0
7	Revision and Mid Exam				
8	diodes characteristics and Zener applications	3	2	1	0
9	Principles of operation for Bipolar junction transistors (BJT)	3	2	1	0
10	Principles of operation for Bipolar junction transistors (BJT)	3	2	1	0
11	BJT common modes	3	2	1	0
12	for operation of Principles JFET transistor	3	2	1	0
13	Principles of operation for MOSFET	3	2	1	0
14	Principles of operation for MOSFET	3	2	1	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)	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 %
7	Assignments / Project /Portfolio/ Logbook	4,6,11,12	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)	Microelectronic Circuits-Oxford "Adel Sedra, , 8th-Edition,2020."University Press
	Other References	Electronic-"Robert Boylestad,Louis Nashelsky , ,11th-Edition,2014. "Devices-and-Circuit-Theory
	Electronic Sources (Links must be added)	Available Presentation (handed to students part by part on the Microsoft teams course class .
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *		
	Supplies	White board, Projector and Microsoft teams .
	Skill Labs/ Simulators	Proteus or Multisim.

	Course Coordinator	Program Coordinator
Name	Dr. Eslam Samy EL-Mokadem	Assistant Prof. Taghreed Saied
Signature	Eslam Samy EL-Mokadem	Taghreed Saied

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Electric Machines			
Course Code (according to the bylaw):	EEC 103			
Department/s that participated in the teaching:	Electrical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	-	3
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof. Dr. Taghreed Said			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/11/2025			

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

Elements of Electric Drives, DC motor drives including conventional, brushless and modern permanent magnet motors; AC motor drives including induction and synchronous motors. Magnetic Circuits: Magnetic equivalent circuit, analogy with electric circuits, losses, linear and non-linear magnetic circuits calculations. Transformers: Single phase transformers, principle of operation, equivalent circuit, equivalent parameters determination, three phase transformers,

connections of transformers, autotransformers, harmonics, Principles of operation of DC machines.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (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	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Analyze magnetic circuits and electromechanical energy conversion principles.
		LO2	Explain operating principles of transformers and DC machines.
		LO3	Calculate equivalent circuit parameters and performance indicators of transformers and DC machines.
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	Plot and interpret performance curves of transformers and DC machines.
		LO5	Apply testing and simulation methods to evaluate transformer and DC machine performance.
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	LO6	Design basic applications utilizing transformers and DC machines according to their characteristics.
		LO7	Integrate modern tools to develop innovative electromechanical drive solutions.

	sustainable design and development		

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	Magnetic circuit analysis (basic concepts, laws)	3	2	1	0
2	Magnetic circuit analysis (non-linear, losses, analogy with electric circuits)	3	2	1	0
3	Single-phase transformer: construction, operation, transformation ratios	3	2	1	0
4	Single-phase transformer: equivalent circuit	3	2	1	0
5	Phasor diagram and voltage regulation	3	2	1	0
6	Transformer losses, efficiency, daily efficiency	3	2	1	0
7	Revision and Mid Exam				

8	Transformer tests and parameter determination	3	2	1	0
9	Transformer classification and applications	3	2	1	0
10	Electromechanical energy conversion principles	3	2	1	0
11	DC generators: construction, types, operation	3	2	1	0
12	DC generators: equivalent circuit, EMF, power flow, efficiency, applications	3	2	1	0
13	DC motors: construction, types, EMF and torque equations	3	2	1	0
14	DC motors: characteristics, starting, control, braking, testing.	3	2	1	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	Quiz 1 written (Semester work)	4	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	-	-	-
6	Final Oral Exam	-	-	-
7	Assignments / Project /Portfolio/ Logbook	During Semester	20	20%
8	Field training	-	-	-
9	Other (Mention)	-	-	-

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)	1- Fitzgerald & Kingsley's Electric Machinery, 7th Edition, Stephen Umans, 2014 2- B. L. Theraja and A. K. Theraja " Text Book of Electrical Technology " volume-1, S. CHAND & COMPANY LTD, New Delhi, 2014 . 3- U.A. Bakshi and V. U. Bahshi " Electrical Technology", Technical Publications , Pune, India, 2020.

	Other References	
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data Show
	Supplies	White board
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Assoc. Prof. Dr. Taghreed Said	Assoc. Prof. Dr. Taghreed Said
Signature	<i>taghreed said</i>	<i>taghreed said</i>

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Mechatronics Engineering			
Course Code (according to the bylaw):	MTE 101			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	-	3
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Abu El -FADL			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Definitions of Mechatronics Engineering, Mechatronics Engineer skills & responsibilities. A typical Mechatronics system (Target system, Sensors, I/O signal conditioning, Control unit, Actuator, & Monitoring). Methodology of analysis and design of Mechatronics system. Examples of, sensors, control unit, electro-mechanical and electromagnetic actuators, shape

memory alloys (SMA), artificial muscles using SMA, piezoelectric actuators. Pneumatic actuator, electro- Pneumatic systems- Introduction and hands on a software package used in Mechatronics system analysis and design

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A3, 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 engineering fundamentals, basic science and mathematics.	LO1	Identify the principles of mechatronics systems including sensors, control units, actuators, and signal conditioning.
		LO2	Apply the methodology of analysis and design for mechatronics systems.
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	Design mechatronics systems considering simulation, materials selection, mechanical implementation, control, interfacing, and software testing.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Acquire new knowledge on advanced actuators (electro-mechanical, electromagnetic, SMA, piezoelectric, pneumatic) and their applications in mechatronics.

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 Mechatronics Engineering	3	2	1	-
2	Skills and responsibilities of Mechatronics Engineers	3	2	1	-
3	Typical Mechatronics system (Target system, Sensors, Signal Conditioning)	3	2	1	-
4	Typical Mechatronics system (Control Unit, Actuators, Monitoring)	3	2	1	-
5	Methodology of analysis and design of Mechatronics system	3	2	1	-
6	Examples of Sensors	3	2	1	-
7	Revision and Mid Exam				
8	Control Unit	3	2	1	-
9	Electro-mechanical and electromagnetic actuators	3	2	1	-
10	Shape Memory Alloys (SMA)	3	2	1	-

11	Artificial muscles using SMA	3	2	1	-
12	Piezoelectric actuators	3	2	1	-
13	Pneumatic actuators and electro-pneumatic systems	3	2	1	-
14	Introduction and hands-on software package for mechatronics system design	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)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
7	Assignments / Project /Portfolio/ Logbook	According to schedule	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)	W. Bolton; "Mechatronics – Electronic Control Systems in Mechanical & Electrical Engineering.", 2019 Longman, seventh edition,
	Other References	Alciator & Histan, "Introduction to Mechatronics & Measurements Systems"; McGraw-Hill, Second,
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Elvis LabVIEW- Breadboard –power supply
	Supplies	Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A

	Course Coordinator	Program Coordinator
Name	Dr.Ahmed Abu El -FADI	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Biomedical Engineering			
Course Code (according to the bylaw):	MDE 101			
Department/s that participated in the teaching:	Biomedical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	-	3
Course Type:	Elective			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass. Prof. Amal EL Dosoky			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

History of biomedical engineering, examples of biomedical engineers contributions and research fields classification of biomedical engineering, the interrelation between systems and biomedical engineering, examples of physiological systems and medical instruments – General overview about different biomedical devices and hospital departments from point of view of

device name, function, and its place in the hospital.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A5, A8, 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 engineering fundamentals, basic science and mathematics.	LO1	Analyze how biomedical devices solve physiological problems.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO2	Investigate recent innovations in biomedical engineering using appropriate research methods.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Collaborate to develop a group presentation on a biomedical engineering topic.
		LO4	Present biomedical case studies and devices effectively through oral and written reports.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO5	Summarize the functions of vital signs and related medical devices.
		LO6	Explore independently new trends and developments in biomedical 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	An overview: general idea about the concepts of Biomedical Engineering and its applications in the field.	3	2	1	
2	Introduction to Human anatomy and physiology.	3	2	1	
3	Cardiovascular and Respiratory Systems with Related Devices	3	2	1	
4	Nervous and Muscular Systems with Related Devices	3	2	1	

5	Classification of Biomedical Engineering and Fields Introduction to Bio-signal	3	2	1	
6	Introduction to Bio-Imaging	3	2	1	
7	Revision and Mid Exam				
8	Introduction to Bio-Instrument	3	2	1	
9	Introduction to Bio-mechanics	3	2	1	
10	Hospitals and its Organization	3	2	1	
11	Hospital Departments and Devices – Part 2 and Quiz	3	2	1	
12	Biomedical Engineering: Innovations (future trends) and Opportunities	3	2	1	
13	Student Presentations / Mini-Projects	3	2	1	
14	Student Presentations / Mini-Projects	3	2	1	
15,16	Final Exam.				

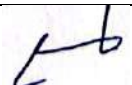
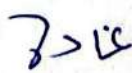
5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Quiz	11	10	10%
2	Midterm exam	7	20	20 %
3	Final Written Exam	15, 16	40	40 %
4	Assignments / Mini-Projects /Sheets	Across the term and According to the schedule	30	30%

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (must be written in full according to the scientific documentation method)	S.A.BERGER (1996). INT.TO BIOENGINEERING. N.YORK: OXFORD. ANDREW G. WEBB (2018). PRINCIPLES OF BIOMEDICAL. NEW YORK: CAMBRIDGE
	Other References	

references, etc.) *	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Amal EL Dosoky	Dr. Ghada Karim
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

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/ARS).

Program Outcomes (NARS/ARS) (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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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. 2-Presentation disponible (remis aux etudiants partie par partie).2022 3-Grammaire Francais en usage.2022 4-Vocabulaire Francais utilise.2022
	Electronic Sources (Links must be added)	https://www.ecpi.edu/blog/what-is-business-administration-all-about
	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.

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

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

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

Beginner's course. Development of speaking ability and mastering of German basic structures. Reading and understanding 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) (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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Abschnitt 1: Der Artikel, die Konjugation der Verben.	2	2	0	---
2	Abschnitt 1: Übungen, die Personalpronomen, 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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Heinz Griesbach-Dora Schulz Deutsche Sprachlehre für Ausländer, 1995
	Other References	1- Friederike Jin & Ute Voß Grammatik aktiv- Deutsch als Fremdsprache 2. Aktualisierte Ausgabe, Aug. 2024 2- PONS Verben & Zeiten Trainieren Deutsch als Fremdsprache, Jan. 2020 3- Stephan Lübke Deutsche Grammatik in kleinen Schritten, Jun 2020 4- Julia Brodt Ein Semester in Hamburg: Roman – Deutsch lernen mit Geschichten über das Leben in Deutschland, Dec. 2024
	Electronic Sources (Links must be added)	Deutsche Welle (DW)
	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	Lab Room
	Other (to be mentioned)	Notebook and data show equipped lecture room.

	Course Coordinator	Program Coordinator

Name		Prof. Ahmed Abd El-Gafar
Signature	Dr. Hoda Arafa.	
		

المستوى الاول (SOPHOMORE)

فصل دراسى ثالث (تدريب)-نموذج هيئة جديد

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (1)			
Course Code (according to the bylaw):	FTR 131			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	18	-	18
Course Type:	Compulsory			
The level to which the course was introduced:	SOPHOMORE			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. prof. Amr Hassaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

This is specialized training in which the students spend their training period in any engineering institution, firms or training centers. Students should demonstrate the

professional and practical skills they acquired during discussion with the examination committee.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A4, A8, A10, 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	Interpret the knowledge acquired in academic courses during practical training.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	LO2	Apply health, safety, and environmental rules in performing engineering training tasks.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tool.	LO3	Communicate engineering ideas effectively through written reports and oral discussions with the examination committee.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	LO4	Use computer-aided design (CAD) systems to support training tasks and self-learning.
B3	Select conventional mechanical equipment according to the required performance.	LO5	Select appropriate tools and equipment for examining mechanical systems.

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:

Scientific topics depend on the defined training field/site

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	Train on the overall mechanical and flowchart of processes	18	-	-	18
2	Train on the overall mechanical and flowchart of processes	18	-	-	18
3	Carry out research using granted internet sites for references related to students' training process	18	-	-	18
4	Mid Exam				
5	Train on how to write scientific report	18	-	-	18
6	Write technical report	18	-	-	18
7	Review and practice the gained skills	18	-	-	18
8	Final Evaluation.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	On site evaluation	3	20	20 %
2	Midterm exam	4	20	20 %
3	Final Oral Exam	8	30	40 %
4	Attendance	7	10	10 %
5	Training report discussion	7	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)	Provided by the training site
	Other References	Training handouts
	Electronic Sources (Links must be added)	According to training site
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show Internet connection
	Supplies	N/A
	Electronic Programs	N/A
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Amr Hassaan	DR. MOHAMED ASHRAF
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Stress Analysis			
Course Code (according to the bylaw):	ENG 144			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Dr. Saleh Sobhy			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Mechanical Engineering			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Introduction, definitions, stress, strain, etc. Generalized Hooke's Law, torsion, bending, transverse loading, design of beams for strength, shearing force and bending moment diagram, yield and fracture criteria, elastic stress analysis.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, 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	Describe different types of stress and strain under various loading conditions
		LO2	Distinguish between statically determinate and indeterminate structures
A2	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 stress analysis techniques to support safe mechanical design
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO4	Explain analytical methods used for stress and deformation problems in mechanical elements
		LO5	Design beams, shafts, and structural components to meet strength and performance 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			LOs covered by course
			Theoretical teaching (lectures)	Training		
				Tutorial	/ Practical Lab	
1	Introduction, concept of stress, axial loading, normal stress	4	2	2		LO1, LO2
2	Shearing stress, bearing stress in connections.	4	2	2		LO1, LO2
3	Stress under general loading conditions.	4	2	2		LO1, LO2
4	Stress and strain – axial loading and normal strain	4	2	2		LO3
5	Hooke's law, deformation under axial loading.	4	2	2		LO3
6	Poisson's ratio generalized Hooke's law, dilatation, and Bulk modulus. Shearing strain	4	2	2		LO3
7	Revision and Mid Exam					
8	Torsion, stress in shaft, deformation in circular shafts, angle of twist.	4	2	2		LO3

9	Statically indeterminate shafts, design of transmission shafts	4	2	2		LO4
10	Pure bending, prismatic members in pure bending	4	2	2		LO5
11	Deformation in pure bending, stresses and deformation in elastic range.	4	2	2		LO1, LO4
12	Transverse loading of prismatic members, distribution of normal stresses,	4	2	2		LO1, LO4
13	Shearing stresses in a beam, shearing stresses in thin-walled members.	4	2	2		LO4, LO5
14	Design of beams for strength: shear and bending moment diagrams, relations among P, V & M	4	2	2		LO4, LO5
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)	3	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	9	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)	F.P.Beer and E.R. Johnston, Jr.: "Mechanics of materials "Mc Graw-Hill, 7th ed., 2018.
	Other References	R.C Hebbeler :— Mechanics of materials — , printice Hall, Pearson education international. 5 th ed ,2003

	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Universal Testing Machine - Hardness Tester- Impact Testing Machine - Torsion Testing Machine
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Saleh Sobhy	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

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) (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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	1. Schaum's Outline of Differential Equations, 5th Edition, ISBN: 9781264258826, 2022McGraw Hill. 2. Erwin Kreyszig, Advanced Engineering Mathematics, Edition 10 (2011), Wiley. 3. Earl W. Swokowski, "Calculus". 4. Thomas' Calculus: Early Transcendentals 5. Richard Bronson (Author), Gabriel B. Costa, Schaum's Outline of Differential Equations, Fifth Edition 6. Erwin Kreyszig, Advanced Engineering Mathematics

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

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

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A2		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 concepts of cost and revenue in engineering economic decisions.
		LO2	Explain the concept and purpose of breakeven analysis in evaluating economic viability.
		LO3	Classify cost elements as fixed or variable within project scenarios.
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	Apply breakeven analysis techniques to assess company profitability in realistic business cases.
		LO5	Analyze project data to evaluate profitability and financial risks.
		LO6	Solve engineering economic problems using nominal and effective interest rate formulas in case studies.
		LO7	Design a proposed project by identifying 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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, 1e and blank, P.E Anthony, seventh edition, 2018 build by Mc Grain
	Other References	• Engineering economy analysis, 9th edition, Donald G Newman and Ted G., 2004 published by Oxford University Press, Inc. • Jose A. Sepulveda, William E. Souder & Byron S. Gottfried, "Engineering Economics", Mc-Graw-Hill Book Company, NW, 1984. • H. G. Thuesen, W. J. Fabrycky & G. J. Thuesen, "Engineering Economy", Prentice-Hall, Inc., NJ, 1971. • E. Paul DeGarmo, William G. Sullivan & James A. Bontadelli, "Engineering Economy", Macmillan publishing company, NW, 1990.
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data Show
	Supplies	N/A
	Electronic Programs	MS-Teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Muhammad Tayssir	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A5, A8, A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A5.	Practice research techniques and methods of investigation as an inherent part of learning.	LO1	Identify the purpose, characteristics, and structure of technical writing, and distinguish it from general writing.
		LO2	Differentiate between the key components of technical reports, CVs, letters, and technical presentations.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Apply the principles of technical writing to produce structured technical documents such as reports, CVs, and presentations.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Revision and Mid Exam				
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	Final Exam.				

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	Semester work (CV and letter Exercise)	10	10	10%
4	Midterm Exam	8	20	20 %
5	Final Written Exam	15, 16	40	40 %

6- Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (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: http://www.oracle.com/us/corporate/citizenship/corporate-citizenship-report-2563684

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

	Course Coordinator	Program Coordinator
Name	Dr. Mohamed Elsayed	Dr. Mohamed Ashraf
Signature	محمد السيد	محمد اشرف

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Computer Graphics			
Course Code (according to the bylaw):	ENG 147			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	3	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Abdou Abdallah Hassan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Main features of the computer graphics software used such as, menus , drawing area ,function keys File (open, new , save, editing.....), Drawing tools (line, spline, polygon, arc, circle, splines, rectangle ,.....), Modifying menu (Erase ,Move, Copy, Mirror, Break ,....), format exchange(import ,export) , file output (printing ,plotting), surface

and solid modeling in 3D , dimensions and inquiry. Drawing exercises and assignments, Engineering drawing A&B problems but using computer graphics – Small course work project.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A10, B2 & B4)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO1	Identify the essential CAD software functions for 2D and 3D modeling.
		LO2	Apply CAD commands to produce accurate graphical representations of mechanical components.
		LO3	Generate dimensioned 2D drawings from 3D models using CAD software.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO4	Develop parametric 3D models and corresponding 2D manufacturing drawings.
		LO5	Evaluate CAD outputs through dimension verification and plotting quality checks.
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems.	LO6	Implement national and international standards in CAD drawings using libraries and templates
		LO7	Create submission-ready CAD documentation compliant with regulatory 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to SolidWorks software interface	4	1	-	3
2	Basic 2D drawing tools and modification commands	4	1	-	3
3	Fundamentals of 3D modeling	4	1	-	3
4	Essential 3D modeling operations	4	1	-	3
5	Advanced 3D features and editing	4	1	-	3
6	Complex 3D operations	-	-	-	-
7	Revision and Mid Exam				

8	Complex 3D model editing	4	1	-	3
9	3D Thread modeling	4	1	-	3
10	Converting 3D models to 2D drawings	4	1	-	3
11	2D modification commands	4	1	-	3
12	2D modification commands	4	1	-	3
13	Dimensioning & Annotation	4	1	-	3
14	Revision	4	1	-	3
15,16	Final Exam.				

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Tutorial assessment (<i>Term Work</i>)	weekly	30	30%
2	Midterm exam (<i>lab</i>)	7	30	30 %
3	Final Exam (<i>lab</i>)	15, 16	30	30 %
4	Quizzes/reports (<i>Term Work</i>)	According to the schedule	10	10%

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)	-Verma, C. S., Purohit, R., Gupta, K., Verma, H. (2025). Computer Graphics and CAD. CRC Press. -Bethune J. and Brown N. (2023). Engineering Design and Graphics with SolidWorks 2023. Pearson.
	Other References	Course notes are available to the students on the copy center of the Institute and Microsoft teams.

	Electronic Sources (Links must be added)	NON
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr Abdou Abdallah	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

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

Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (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 key art movements and their influence on architecture throughout different historical periods.
		LO2	Analyze the application of artistic forms in architectural design problems.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO3	Conduct research on painting, sculpture, photography, and interior design in relation 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	Communicate design concepts using various art techniques to address architectural challenges.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	LO5	Apply knowledge from major art schools to architectural and artistic practices.
		LO6	Develop design proposals integrating artistic values into 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	3	2	1	0

	architecture art				
4	Modern School Trends (De Steel - Bauhaus _ and Their Impact on Architecture Arts).	3	2	1	0
5	Quiz 1 & 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	Revision and Mid Exam				
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	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)	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 /Portfolio/ Logbook	1,2,3,4,5,6,8,9,10,11,12,13,14	25	25 %

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)	Abdel-Gawad, T. A. (1955). <i>History of Architecture and Arts in the Early Ages</i> (in Arabic). Cairo: Supreme Council of Antiquities Cruikshank, D. (1999). <i>A History of Architecture</i>. New Delhi: CBS Publisher
	Other References	• White, Edward T (1975): A Vocabulary of Architectural Forms, Architectural Media. • William (Author) (2010): The Art of Drawings, Madison Books; Revised ed. Edition. • Architecture, Form, Space, and Order by Frank Ching • Francis D.K. Ching (2007): Architecture: Form. Space & Order, Van Nostrand • Reinhold, New York. Paul Zelenski, Mary Pat Fisher (2006): Shaping Space: The Dynamics of Three-Dimensional Design, (3rd edition). www.amazon.com • Stephen Luecking (2002): Principles of Three-Dimensional Design: Objects, Space and Meaning, www.amazon.com • Wucius Wong (1977): Principles of Three-Dimensional Design, Van Nostrand Reinhold Company, New York • "The Architecture of Happiness" by Alain de Botton (2006): Examines the relationship between architecture and human well-being, combining philosophy and design. • "The Future of Architecture in 100 Buildings" by Marc Kushner (2015): Explores innovative and groundbreaking architectural designs from around the world. • "Bauhaus: A Conceptual Model" by Boris Friedewald (2019): A comprehensive look at the Bauhaus movement and its impact on architecture and design • "The Art of Looking Up" by Catherine McCormack (2019): A visual feast exploring the diverse world of ceilings in significant buildings worldwide. • "The Hare with Amber Eyes" by Edmund de Waal (2010): Though not the latest, it's a notable work exploring the history of a collection of Japanese

		netsuke through generations. • Norman, D. (2023). <i>Design for a better world:</i> Meaningful, sustainable, humanity centered. The MIT Press. • Peters, S. (2024). <i>Architectural material systems:</i> Conceptual design strategies. Birkhäuser. • Fowkes, M., & Fowkes, R. (2023). <i>Art and climate change:</i> A concise <i>history</i>. Thames & Hudson.
	Electronic Sources (Links must be added)	• http://www.sagradafamilia.org/en/ • https://www.skyscrapercity.com/ • http://www.design-theory.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show (projector) Laptop or desktop computer

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

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

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).

Program Outcomes (NARS) (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	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Calculate voltage, current, power, and energy in complex DC and AC circuits.
		LO2	Apply Ohm's law and Kirchhoff's laws to analyze DC and AC circuits.
		LO3	Perform nodal and mesh analysis for multi-loop circuits.
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	Verify circuit theorems (Superposition, Thevenin, Norton, Maximum Power Transfer) experimentally and computationally.
		LO5	Use circuit simulation software (e.g., SPICE) to determine voltage drops, currents, and power in electrical networks.
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.	LO6	Design circuits with optimal load conditions to achieve maximum power transfer or a predefined phase shift.
		LO7	Evaluate the safe operating conditions of circuit components to prevent overheating.

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	Basic concepts: voltage, current, power, energy, independent & dependent sources	3	2	1	
2	Ohm's law, Kirchhoff's laws, series & parallel DC circuits	3	2	1	
3	Nodal analysis & mesh analysis	3	2	1	
4	Superposition & source transformation	3	2	1	
5	Thevenin's, Norton's, and Maximum Power Transfer theorems	3	2	1	
6	Capacitance & inductance (series & parallel)	3	2	1	
7	Revision and Mid Exam				

8	Phasor representation & complex impedance	3	2	1	
9	Kirchhoff's laws in phasor domain	3	2	1	
10	Series & parallel AC circuits (analysis)	3	2	1	
11	AC circuits: continued (phasor approach)	3	2	1	
12	Circuit theorems in AC circuits (Thevenin, Norton, Maximum Power Transfer)	3	2	1	
13	Application of simulation software (SPICE) for AC/DC circuit analysis	3	2	1	
14	Component safety, phase shift load design, general revision	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	Final Exam (<i>written</i>)	15th	40	40 %
2	Midterm written Exam (<i>Term Work</i>)	7th	20	20 %
5	Quizzes/reports/presentations (<i>Term Work</i>)	6th & 11th/ during the semester	40	40 %

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)	Electric Circuits", James W. Nilsson, Susan Riedel, Eleventh edition, Global Edition-Pearson 2019
	Other References	Fundamentals of electric circuits", Charles K. Alexander, Matthew N. O. Sadiku, fifth edition, McGRAW-HILL, 2013.
	Electronic Sources (Links must be added)	

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *		
	Supplies	White board, Projector and Microsoft teams .
	Skill Labs/ Simulators	

	Course Coordinator	Program Coordinator
Name	Dr. Eslam Mansour	Ass.Prof.Dr. Taghreed Saied
Signature	<i>Dr. Eslam Mansour</i>	Taghreed Saied

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Principles of Design & Manufacturing Engineering			
Course Code (according to the bylaw):	ENG 103			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	--	3
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mohamed Ali			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Mechanical components, Motion and power transmission elements, Standard machine elements (threads, fasteners, locking devices, keys, splines, gears, pulleys, bearings, pipe connections,

etc.), Welding and riveting conventions, Basics of Machine elements design, Stress analysis, Basic machining processes, Applications of robotics technology.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (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	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO1	Identify standard and customized machine elements used in mechanical systems
		LO2	Solve stress and fatigue problems in machine components using engineering principles.
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	LO3	Model machine elements using mathematical methods and SolidWorks software.
		LO4	Design machine elements to satisfy functional and operational requirements.
		LO5	Select suitable standard machine components based on calculations and performance analysis.
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	LO6	Apply basic machining and manufacturing processes in the design of machine components.
		LO7	Integrate robotic and automation elements into mechanical design considering sustainability and efficiency.

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	Material and their properties, manufacturing technology	3	2	1	-
2	Modes of fractures	3	2	1	-
3	Failure Theories	3	2	1	-
4	Design of fasteners	3	2	1	-
5	Power screw	3	2	1	-
6	Shaft design	3	2	1	-
7	Revision and Mid Exam				
8	Complex stress on the shafts	3	2	1	-

9	Gear design	3	2	1	-
10	Gear design	3	2	1	-
11	Rolling bearings selection	3	2	1	-
12	Sliding bearing design	3	2	1	-
13	flat pulley transmission	3	2	1	-
14	V-belt and pulley transmission	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)	6	5	5%
2	Exam 2 written (Semester work or quiz)	10	5	5%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical/Clinical/... Exam	--	--	--
6	Final Oral Exam	--	--	--
7	Assignments / Project /Portfolio/ Logbook	30	0	30%

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)	Khurmi, R. S., and J. K. Gupta. <i>A Textbook of Machine Design (LPSPE)</i> . S. Chand publishing, 2019.
	Other References	• Jonathan Wickert, An Introduction to Mechanical Engineering, CL - Engineering, 2nd Ed., 2005. • D.K. Singh, Fundamentals of Manufacturing Engineering, CRC Press, 2008. • Robert L Mott, Machine Elements in Mechanical Design, Prentice Hall, 4th Ed., 2003.
	Electronic Sources (Links must be added)	NA

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Mohamed Ali	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Analysis & Research Skills			
Course Code (according to the bylaw):	HUM 109			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	2	-	3
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	PROF. Ahmed Abd El-Gafar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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).

Program Outcomes (NARS) (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.	LO1	Solving problems related to SWOT analysis, decision making, team work decision.
		LO2	Working in a team group.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Describe the main concepts of basics Web search methods.
		LO4	Explain the main principle of Role of creativity in the analysis for different alternatives.
		LO5	Elucidate the main principal SWOT analysis for different alternatives.
		LO6	Clarify the main principal Cost – Benefit analysis and Risk analysis.

A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO7	Evaluating search results, choosing the appropriate search engine.
		LO8	Assess issues of Phases of problem solving (Understanding the problem and formulating it, Solution plan, Implementation plan, Evaluation, and Revision).
A10	Acquire and apply new knowledge and practice self, lifelong and other learning strategies.	LO9	Design the problems of role of cooperation and team – work in analyzing large engineering problems.
		LO10	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab

1	Basics Web search methods 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	14	40	40 %
5	presentation skills	9,10	10	10
6	Assignments	11	10	10

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)	HTI; Available Hard copy . Available Presentation (handed to students' part by part)
	Other References	1-G.R.Notess, Tesching Web Search Skills, information Today Inc., 2021. 2-D.Newnan, T.Eshenbach, and J.Lavelle, Engineering Economic Analysis, Oxford University Press, fourteenth edition, 2019. 3-Search skills for researchers “workshop”, Engineering economic analysis by Donald G. Newnan .et., al, 2018. 4-G.R.Notess, Tesching Web Search Skills, information Today Inc., 2021. 5-D.Newnan, T.Eshenbach, and J.Lavelle, Engineering Economic Analysis, Oxford University Press, fourteenth edition, 2019. 6-Murray, R. 2018: How to survive your viva. Maidenhead:Open University Press. 7-Rugg, G. & Petre, M. 2021: The unwritten rules of PhD research. Maidenhead:Open University Press. 8-Tinkler, P. & 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.
	Electronic Sources	http://www.scribd.com/anh_ch%C3%A2u_6/d/62390771-Change-Management-Best-Practice-Guide >

	(Links must be added)	
	Learning Platforms (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	PROF. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Statistics and Probability Theory			
Course Code (according to the bylaw):	MTH 105			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass. Prof. Tarek Nassar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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).

Program Outcomes (NARS) (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	LO1	Apply the different statistical measurements for analyzing grouped and ungrouped data.
		LO2	Recognize the axioms of the probability to calculate the probability for any event.
A2	Apply techniques for calculate probabilities, expectation, and variance.	LO3	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	LO4	Represent: box plot, stem&leaf, histogram, frequency polygon, and scatter diagram.
		LO5	Compute the relation strength between two variables and predict one variable by anther with the regression equation.

A5	Classify random variables and density function.	LO6	Connect between a random variable and density function.
		LO7	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.	LO8	Use the confidence interval method to compute the mean interval.
		LO9	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
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	4	2	2	

	and compute the regression equation				
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	Mid Exam				
8	Probability distribution: Binomial , Poisson	4	2	2	
9	Probability distribution: normal, standard, student	4	2	2	
10	Relation between distributions	4	2	2	
11	Confidence interval to find the mean interval of the mean population	4	2	2	
12	Hypothesis Testing (The structure of a hypothesis test and testing the mean of population)	4	2	2	
13	General revision and quiz (2)	4	2	2	
14	Sheet and report	4	2	2	
15,16	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	15	15%
2	Quiz 2 written (Semester work)	13	15	15%
3	Midterm exam	7	20	20 %
4	Final Written Exam	14	40	40 %

7	Assignments / Project /Portfolio/ Logbook	12	10	10%

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)	Introduction to Probability and Statistics for Engineers and Scientists, By Sheldon M. Ross, 2021 Elsevier, ISN: 978-0-12-824346-6, 6th edition.
	Other References	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
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	White board
	Supplies	Teaching aids and power point
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Ass. Prof. Tarek Nassar	Prof. Ahmed Abdelghafar
Signature	<i>Ass. Prof. Tarek Nassar</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Monitoring & Quality control systems			
Course Code (according to the bylaw):	MNG 101			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	1	--	2
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr.Radwa A. Ghazalla			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minutes of department			
Course Specification Approval Date:	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).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A4, A8, A9		Upon completion of the course, the student will be able to:	
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	Apply statistical methods to evaluate operational or quality performance according to industry standards.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO2	Present performance outcomes using graphical data and visual tools to effectively communicate with different audiences.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	LO3	Compare quality management systems to support continuous improvement and innovation.
		LO4	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Revision and Mid Exam				
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	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)	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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	Project Management: a systems approach to planning, scheduling, and controlling. Kerzner, Harold. (2020).
	Other References	Montgomery, D. C., "Introduction to Statistical Quality Control", 8th Edition, Wiley, 2020.
	Electronic Sources (Links must be added)	MIT OpenCourseWare – Quality Control and Process Improvement https://ocw.mit.edu ISO Official Website (Standards & Certification) https://www.iso.org NIST – Process Capability & Quality Metrics https://www.nist.gov/services-resources/software/process-capability-analysis
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive	Devices/Instruments	Data Show

facilities & equipment for teaching and learning *	Supplies	N/A
	Electronic Programs	MS-Teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Radwa A. Ghazalla	Dr. Mohamed Ashraf
Signature	رضوى غزاله	محمد اشرف

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Thermodynamics (2)			
Course Code (according to the bylaw):	MEC 151			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mohamed Ashraf			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

This course covers second law of thermodynamics, reversible and irreversible process. Reversible cycles and irreversible (actual) cycles. Entropy and the isentropic processes. The third law of thermodynamics. Reversible steady flow work and work of compressor. Adiabatic efficiency of turbine, compressor and nozzle. Gas-power cycles: Otto, Diesel and Brayton cycles. Vapor-power cycles: Rankine cycle and its modifications.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A3, B1, B3)		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 performance parameters of heat engines, refrigerators, and heat pumps.
		LO2	Formulate the entropy change laws for pure substances and ideal gases.
		LO3	Solve thermodynamic problems related to steady-flow devices, including work and efficiency.
A2	Develop and conduct appropriate data, assess, and evaluate findings, and use statistical analyses and objective experimentation and/or simulation, analyze and interpret engineering judgment to draw conclusions.	LO4	Evaluate the differences between actual, ideal, and non-viable thermodynamic systems.
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.	LO5	Apply thermodynamic processes to improve the efficiency and economic performance of power cycles.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations	LO6	Analyze the thermodynamic operation of heat engines and refrigeration systems.
		LO7	Analyze the energy transformation in turbines, compressors, and nozzles.
		LO8	Conduct energy analysis of gas and vapor power cycles using thermodynamic methods.

B3	Select conventional mechanical equipment according to the required performance.	LO9	Select appropriate thermodynamic equipment (pump, compressor, turbine, boiler, condenser) for efficient system design.

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 the second law of thermodynamics, thermal energy reservoirs and heat engines. - Refrigerators and heat pumps.	4	2	2	
2	- Reversible, irreversible process and irreversibility.	4	2	2	
3	- The thermodynamics temperature scale, efficiency of Carnot heat engine, coefficient of performance of Carnot refrigerator and Carnot heat pump.	4	2	2	
4	- Problems - Clausius inequality and entropy.	4	2	2	
5	- The increase of entropy principle - Diagrams involving entropy, Tds relations.	4	2	2	

6	- The change of entropy and isentropic process for pure substances - Problems	4	2	2	
7	Revision and Mid Exam				
8	- The change of entropy and isentropic process for ideal gases - Problems	4	2	2	-
9	- Reversible steady-flow work. - Minimizing the compressor work. - Problems	4	2	2	-
10	- Adiabatic efficiency of some steady flow devices, turbine, compressor, and nozzle.	4	2	2	-
11	- Problems - Otto cycle	4	2	2	-
12	- Diesel cycle - Brayton cycle	4	2	2	-
13	- Problems - Vapor power cycles (Rankine cycle)	4	2	2	-
14	- Revision	4	2	2	-
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)	5	10	10 %
2	Midterm exam	7	20	20 %
3	Exam 2 written (Semester work or quiz)	10	10	10 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Sheets	Through Semester	10	10 %
6	In-Class questions	Through Semester	10	10 %

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)	Yunus A. Cengel and Michael A. Boles “THERMODYNAMICS: An Engineering Approach” McGraw-Hill, New York., Eight Edition, 2019
	Other References	Irving Granet, Jorge Alvarado, Maurice Bluestein, “Thermodynamics and Heat Power, Ninth Edition, CRC Press, 2023 Course Notes: Available as softcopy on Microsoft teams
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Other (to be mentioned)	Library

	Course Coordinator	Program Coordinator
Name	Dr. Gamal Nada	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Thermo-Fluid Lab (1)			
Course Code (according to the bylaw):	MEC 152			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	2	-	2
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Gamal Nada			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Safety Instructions – Introduction and types of fluid meters, velocity measurements, flow rate measurements – Some of tests and experiments for statics and dynamics of fluid; pressure and temperature measurements, hydrostatic pressure force – Verification of Bernoulli equation – Experiment of laminar and turbulent flow – Determination of head losses through pipes and pipe fittings – Experiments of thermal applications for ideal gas and pure substance.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2,A4, B2, 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	Conduct experiments related to the fluid mechanics such as pressure, velocity and flow rate measurements.
		LO2	Develop experiments to determine the hydrostatic pressure force on plane area and also the force of impact of flow jet.
		LO3	Conduct experiments related to the thermodynamics for ideal gas and pure substance (steam).
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	LO4	Apply the health, safety and environmental rules during the experiments.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO5	Carry out different experiments related to different objectives for both fluid mechanics and thermodynamics.
B3	Select conventional mechanical equipment according to the required performance.	LO6	Distinguish between the different sensors (devices) used for fluid 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	- Introduction to the laboratory: Health and safety instructions	2	-	-	2
2	- Experiment of hydrostatic pressure force	2	-	-	2
3	- Experiment of hydrostatic pressure force, continued	2	-	-	2
4	- Experiment of pressure measurement and calibration	2	-	-	2
5	- Experiment of verification of Bernoulli equation	2	-	-	2
6	Revision				
7	Mid Exam				
8	- Experiment of verification of Bernoulli equation, continued	2	-	-	2
9	- Experiment of orifice near the bottom of the tank	2	-	-	2

10	- Experiment of impact of flow jet	2	-	-	2
11	- Experiment of temperature measurement and calibration	2	-	-	2
12	- Experiment of expansion processes of perfect ideal gases	2	-	-	2
13	- Experiment of saturation pressure (Characteristics of saturated-water vapor)	2	-	-	2
14	- Revision	2	-	-	2
15,16	Final Exam.				

Experiment Topics: (If any)

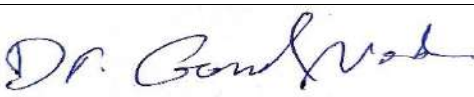
Serial	Experiment
1	Experiment of hydrostatic pressure force
2	Experiment of pressure measurement and calibration
3	Experiment of verification of Bernoulli equation
4	Experiment of orifice near the bottom of the tank
5	Experiment of impact of flow jet
6	Experiment of temperature measurement and calibration
7	Experiment of expansion processes of perfect ideal gases
8	Experiment of saturation pressure (Characteristics of saturated-water vapor)

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Midterm exam	7	30	30 %
2	Exam 1 written (Semester work or quiz)	11	10	10 %
3	Final Written and Oral Exam	15, 16	30	30 %
4	Reports	through semester	30	30

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)	Yunus A. Çengel, John M. Cimbala and Afshin J. Ghajar, “Fundamentals of Thermal-Fluid Sciences” Sixth Edition, Mcgraw-Hill, New York, 2021.
	Other References	Yunus A. Cengel and Michael A. Boles “THERMODYNAMICS: An Engineering Approach” McGraw-Hill, New York., Eighth Edition, 2015 Course Notes: Available as soft copy on Microsoft teams
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show and laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Other (to be mentioned)	Library

	Course Coordinator	Program Coordinator
Name	Dr. Gamal Nada	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Computer Aided Mechanical Drawing			
Course Code (according to the bylaw):	ENG157			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	3	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Abdou Abdallah Hassan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Fits and tolerance, review of the CAD software used. Use both the hand sketch and the CAD software for construction drawing, working drawing, threads, fasteners, locking

devices, drawing representation of welding rivets, gears pulleys and bearing. Different types of keys and splints.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3, A4, B2, B4)		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	Use computer-aided tools to solve simple engineering design and drawing problems.
		LO2	Apply CAD software to produce accurate mechanical drawings as part of the design process.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	LO3	Utilize SolidWorks software to complete technical exercises aligned with mechanical engineering standards.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO4	Construct technical 2D and 3D models of machine elements using appropriate CAD software.
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to design, build, operate, inspect and maintain mechanical equipment and systems.	LO5	Interpret national and international standards in mechanical drawings, including symbols for threads, welds, keys, gears, and fasteners.

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 engineering drawing, CAD tools overview	4	1	-	3
2	Fasteners: threads, bolts, nuts, locking devices	4	1	-	3
3	Representation of welding and rivets in drawings	4	1	-	3
4	Keys, splines, and their drawing representation	4	1	-	3
5	Gears and pulleys: symbols and drawing standards	4	1	-	3
6	Bearings and machine elements representation	4	1	-	3
7	Revision and Mid Exam				
8	Assembly drawing principles (hand sketch + CAD)	4	1	-	3
9	Assembly drawing: exploded and working views	4	1	-	3
10	Fits and tolerances: principles and applications	4	1	-	3
11	Fits and tolerances in machine elements	4	1	-	3

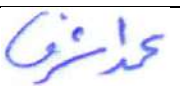
12	Surface roughness and its drawing representation	4	1	-	3
13	Working drawings: construction and detailing	4	1	-	3
14	Integration of standards in working drawings	4	1	-	3
15,16	Final Exam.				

5. Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Tutorial assessment (<i>Term Work</i>)	weekly	30	30%
2	Midterm exam (<i>lab</i>)	7	30	30 %
3	Final Exam (<i>lab</i>)	15, 16	30	30 %
4	Quizzes/reports/presentation (<i>Term Work</i>)	According to the schedule	10	10%

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)	1-Randy H. Shih, " AutoCAD 2016 Tutorial", SDC publications, 2017. 2- Alex Ruiz , and Gabi Jack "SolidWorks 2010",Wiley Publishing, Inc., 2012
	Other References	1-Earle,J.H., Engineering Design Graphics ,5th ed , Addison-Wesley, Publishing company,1987. 2-Mott.L.C., Engineering Drawing and Construction ,2nd ed. , Oxford University,pres,1980.
	Electronic Sources (Links must be added)	Course notes are available to the students on the copy center of the Institute and Microsoft teams.
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	SolidWorks - AutoCAD
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Abdou Abdallah Hassan.	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Diploma Project			
Course Code (according to the bylaw):	MEC 155			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	3	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof. Manal Amin			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

The advisor divides the students into groups; several simple projects related to Mechanical Engineering are to be chosen and divided into the student groups. Each group performs a web search on the project topic – Analysis stage – Design stage. Based on the results obtained, the student(s) completes the assigned task. A final report and a model

(Hardware and/or software) are required in addition to oral defense on front of the advisor.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A7, A8, A9, B3, B4)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO1	Collaborate effectively as an individual and within multi-disciplinary and multicultural teams to achieve project goals.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tool.	LO2	Express engineering ideas clearly and present project outcomes effectively using appropriate technical formats and communication tools.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3	Search for relevant scientific and technical references and survey contemporary technological developments using appropriate tools.
B3	Select conventional mechanical equipment according to the required performance.	LO4	Select appropriate conventional mechanical equipment based on specified performance requirements and justify selection using engineering principles.
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to design, build, operate, inspect and maintain mechanical equipment and systems.	LO5	Apply relevant national and international standards and codes in the design and operation of mechanical systems.
		LO6	Integrate economic and financial considerations in the design, implementation, and evaluation of mechanical 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction and awareness of the aim of diploma project	4	1	-	3
2	Theoretical background for the different projects offered during the course	4	1	-	3
3	Research by each group for theoretical background	4	1	-	3
4	Research and follow up	4	1	-	3
5	Research and discussions	4	1	-	3
6	Design of the project	4	1	-	3
7	Executing the project	4	1	-	3
8	Revision and Mid Exam				

9	Executing the project and feedback	4	1	-	3
10	Experiments and tests	4	1	-	3
11	Report preparation	4	1	-	3
12	Practical working at the final project	4	1	-	3
13	Test the final project	4	1	-	3
14	Review	4	1	-	3
15,16	Final Exam.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Experimental work (1)	5	10	10%
2	Experimental work (2)	9	10	10%
3	Theoretical work (1)	2	10	10%
4	Theoretical work (2)	12	10	10%
5	Midterm exam	8	30	30 %
6	Final Written Exam	15, 16	30	30 %

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)	• Oberg, E., Jones, F. D., Horton, H. L., & Ryffel, H. H. (2016). <i>Machinery's handbook</i> (30th ed.). Industrial Press. -• Budynas, R. G., & Nisbett, J. K. (2014). <i>Shigley's mechanical engineering design</i> (10th ed.). McGraw-Hill Education. • Fox, R. W., McDonald, A. T., & Pritchard, P. J. (2011). <i>Introduction to fluid mechanics</i> (8th ed.). Wiley. • Meriam, J. L., & Kraige, L. G. (2012). <i>Engineering mechanics: Dynamics</i> (7th ed.). Wiley. • Sonntag, R. E., & Borgnakke, C. (2011). <i>Fundamentals of thermodynamics</i> (8th ed.). Wiley.
	Other References	-ASME. (2023). <i>ASME Boiler and Pressure Vessel Code</i>. American Society of Mechanical Engineers. (Section VIII و Section II.) -ASTM International. (2023). <i>Annual Book of ASTM Standards</i>. ASTM International. -ISO. (2023). <i>International standards catalogue</i>. International Organization for Standardization. -IEEE Standards Association. (2023). <i>IEEE standards catalog</i>. Institute of Electrical and Electronics Engineers.
	Electronic Sources (Links must be added)	• ScienceDirect. (n.d.). <i>Engineering journals</i>. Retrieved from https://www.sciencedirect.com • SpringerLink. (n.d.). <i>Engineering publications</i>. Retrieved from https://link.springer.com • IEEE Xplore. (n.d.). <i>Digital library</i>. Retrieved from https://ieeexplore.ieee.org • Google Scholar. (n.d.). <i>Academic research engine</i>. Retrieved from https://scholar.google.com
	Learning Platforms (Links must be added)	EKB - Microsoft office
	Devices/Instruments	Data- show and laptop.

Supportive facilities & equipment for teaching and learning *	Supplies	Workshops (Machining – Melding)
	Electronic Programs	AutoCAD, Solid Work, ANSYS
	Other (to be mentioned)	Work bench with power supply Oscilloscopes

	Course Coordinator	Program Coordinator
Name	Assoc. Prof. Manal Amin	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Mathematical Analysis			
Course Code (according to the bylaw):	MTH 104			
Department/s that participated in the teaching:	<u>BASIC SCIENCES</u>			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	<u>2</u>	<u>2</u>		<u>4</u>
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	D. Hanan M. Ahmed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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

Complex numbers – Polar form of complex numbers – Powers and roots – Curve and regions in the complex plane – Complex functions – Polynomials – Exponential function – Trigonometric functions – Hyperbolic function – Logarithm – General power mapping by special functions- Limits – Continuity - Derivative – Analytic functions – Cauchy Riemann equations – Harmonic function – Line integral in complex plane – Two integration methods – The method of use of the path- Cauchy integral theorem – Path independent – Existence of indefinite integral – Cauchy integral formula – Derivative of analytic function - Practical method of obtaining power series – Uniform convergence – Laurent series – Application - Zeroes and singularities – Residues – Cauchy residue theorem - Evolution of real integral.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	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.	L01	Identify the complex numbers and the polar form of complex numbers .
		L02	Formulate the theorems of Limit Derivative and analytic Function, also the elementary functions.
		L03	Apply Cauchy-Riemann equations and harmonic functions on complex functions to the differentiation and the concept of analytic function
A2	Develop and conduct appropriate experimentation or simulation ,analyze and interpret data , assess and evaluate findings , and use statistical analysis and objective engineering judgment to draw conclusions..	L04	Explain the residues of the complex function with creative thinking in their applications
		L05	Assess issues of the mathematical results
		L06	Study the concepts of the line integrals and the Cauchy-Riemann formula
		L07	Explain the infinite series in the complex plane (power series, Taylor's series, Laurent's series).Discuss integrations in the complex plane
		L08	Apply the residues theorem to handle complex functions with applications.
		L09	Communication skills.

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	Complex numbers. Polar form of complex numbers. Powers and roots. Curves and regions in the complex plane	4	2	2	-
2	Limit, Derivative, Analytic Function, Cauchy Riemann Equation, Exponential function	4	2	2	-
3	Trigonometric functions, Hyperbolic functions, Logarithm, General power, Mapping by Special function	4	2	2	-
4	Complex functions. Polynomials. Exponential function. Trigonometric functions	4	2	2	-
5	Hyperbolic function. Logarithm. General power. Mapping by special functions	4	2	2	
6	Mapping by special functions				

7	Revision and Mid Exam				
8	Line integral in the complex plane. Two integration methods.				
9	Cauchy integral theorem. Path independence. Existence of indefinite integral.				
10	Cauchy integral formulas. Derivative of analytic function. Power series Taylor series				
11	Practical methods of obtaining power series. Uniform convergence.				
12	Laurent series, Applications, Zeros and Singularities. Residues.				
13	Cauchy residue theorem.				
14	Evaluation of real integrals				
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)		10	
2	Exam 2 written (Semester work)		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		20	
8	Field training		0	
9	Other (Mention)		0	

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 Mathematics", zill,2013
	Other References	Complex Analysis with Applications to Number Theory (Infosys Science Foundation Series) 1st ed. 2020 Edition. Mathews, Russell W. Howell.
	Electronic Sources (Links must be added)	• https://math.fandom.com/wiki/Hypermathematics • https://github.com/AlexCharlton/hypermath • https://www.britannica.com/science/mathematics
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Hanan M. Ahmed	Prof. Ahmed Abd El-Gafar
Signature	<i>Hanan M. Ahmed</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Applied mechanics			
Course Code (according to the bylaw):	ENG 102			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	--	4
Course Type:	Elective			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Iman Nassar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Deflection of beam, general equations of elasticity leading to solutions for thick and thin cylindrical structures, Introduction to energy methods of analysis, superposition and dynamic loading effects. Introduction to instability and buckling, the behavior of thin-walled beams, struts and columns.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2)		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	Solve internal force problems in statically determinate and indeterminate beams using fundamental engineering principles.
		LO2	Apply energy-based methods such as virtual work and force method to solve structural mechanics problems.
		LO3	Analyze the behavior of thin and thick cylindrical structures under internal pressure.
		LO4	Evaluate the buckling of columns and identify critical loads using theoretical models.
		LO5	Analyze the deformation of initially curved beams using elasticity and mechanics principles.
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.	LO6	Interpret results of structural analysis techniques and validate with theoretical models.
		LO7	Assess the effects of dynamic loads and instability in mechanical systems.
		LO8	Evaluate stress and strain distribution in thin-walled structures based on engineering judgment.
		LO9	Interpret and compare mechanical behavior of complex systems using combined theoretical and applied 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to Internal Forces in Beams (Support Reactions & Free-Body Diagrams)	4	2	2	-
2	Applications and Problems on Internal Force Analysis	4	2	2	-
3	Energy Methods: Principle of Virtual Work in Structures	4	2	2	-
4	Statically Indeterminate Structures: Force Method (Theory)	4	2	2	-
5	Statically Indeterminate Structures: Force Method (Problem Solving)	4	2	2	-
6	Mechanics of Thin-Walled Pressure Vessels	4	2	2	-
7	Revision and Mid Exam				
8	Stress Analysis in Thick Cylindrical Structures	4	2	2	-
9	Introduction to Initially Curved Beams	4	2	2	-

10	Analysis of Curved Beams: Stress and Deflection Methods	4	2	2	-
11	Buckling and Instability of Slender Columns	4	2	2	-
12	Friction Effects in Mechanical Systems	4	2	2	-
13	Spatial Kinematics of Rigid Bodies	4	2	2	-
14	Gyroscopic Motion: Introduction and Engineering Applications	4	2	2	-
15,16	Final Exam.				

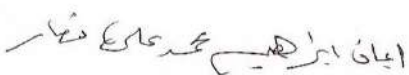
5- Methods of students' assessment:

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

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)	Beer, F.P, (2022)," Mechanics of Material ", McGraw-HILL Book Co, USA
	Other References	Khurmi, R.S.and Gupta, J.K, (2023),"Theory of Machines", Eurasia pub
	Electronic Sources (Links must be added)	https://books.google.com.eg/books?id=6FZ9UvDgBoMC&printsec=copyright&redir_esc=y#v=onepage&q&f=false
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA

teaching and learning *	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Prof. Iman Nassar	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

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

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) (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	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 Mathematical Preliminaries.
		LO2	Describe the nonlinear equation in one variable.
		LO3	Apply the definition of interpolation data points to solve problems.
		LO4	Explain the curve fitting
A5	Practice research techniques and methods of investigation as an inherent part of learning	LO5	Calculate mathematical results using numerical integration and differentiation methods.
		LO6	Justify the initial value problems for ordinary and partial differential equations
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO7	Solve problems of ordinary and partial differential equations
		LO8	Interpret graphically the initial value problems for ordinary and partial differential equations.
		LO9	Model various mathematical problems numerically, including interpolation, integration, and differential equations.
		LO10	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Lab / Practical
1	Mathematical Preliminaries (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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	1. Erwin Kreyszig, Advanced Engineering Mathematics, Tenth Edition, New York : Wiley, 2011. 2. Steven C. Chapra, Raymond, P. Canal, Numerical Methods for Engineers, 4 Th, McGraw-Hill Education, New York, 2015. 3. James F. Epperson, An Introduction to Numerical Methods for Engineers and Scientists, Thrid Hill Education, New York, 2021 4. Mikki Jaramillo, Numerical Methods for Differential Equations
	Electronic Sources	• https://math.fandom.com/wiki/Hypermathematics • https://github.com/AlexCharlton/hypermath

	(Links must be added)	• https://www.britannica.com/science/mathematics • https://www.khanacademy.org/math • https://animated-mathematics.net/
	Learning Platforms (Links must be added)	EKB - Microsoft office

	Course Coordinator	Program Coordinator
Name	Dr. Safinaz Ahmed	Prof. Ahmed Abd El-Gafar
Signature	Safinaz	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Modern Physics			
Course Code (according to the bylaw):	PHY 101			
Department/s that participated in the teaching:	Basic Sciences Department			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Elective			
The level to which the course was introduced:	<u>JUNIOR</u>			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Asst. Prof. Mohamad Abd El-Aziz			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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

Theories of light- energy of light waves- light pressure – introduction of interference- Young's experiment³ interference of thin film– Newton's rings - Michelson interferometer Introduction of diffraction – rectangle single slit and circular aperture- diffraction from a double slit – diffraction grating - Introduction of polarization- methods of polarization - photon and photoelectric effect-Compton effect- black body radiation - Atomic structure- Bohr's model of hydrogen atom- hydrogenic and mesic atom - The nuclear terminology – nuclear radii- binding energy - nuclear models- nuclear energy

level- the nuclear force - Radioactive decay – decay process- radioactive dating – radioactive dosimeter .

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
		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 fundamental physics and mathematical principles relevant to solving engineering problems.
		LO2	Formulate mathematical models and physical laws to represent complex engineering challenges.
		LO3	Solve problems using theoretical concepts and quantitative methods.
		LO4	Evaluate solutions critically to ensure accuracy and applicability to real-world engineering scenarios.
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.	LO5	Analyze experimental or simulation data to draw conclusions.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO6	Implement research methods and techniques to address scientific problems.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO7	Collaborate effectively within diverse teams to achieve common goals.
A8	Communicate effectively – graphically, verbally and in writing – with a range of	LO8	Communicate modern physics concepts clearly using oral, written, and graphical formats.

	audiences using contemporary tools.		
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO9	Demonstrate the ability to independently learn and apply new scientific knowledge continuously.

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	Theories of light - energy of light waves.	4	2	2	0
2	Light pressure- Interference-Young's experiment	4	2	2	0
3	Interference of thin film– Newton's rings	4	2	2	0
4	Michelson interferometer	4	2	2	0
5	Diffraction – rectangle single , circular slit diffraction	4	2	2	0

6	Diffraction from a double slit - diffraction grating	4	2	2	0
7	Revision and Mid Exam				
8	Introduction of polarization- methods of polarization	4	2	2	0
9	Photon and photoelectric effect- Compton effect- black body radiation	4	2	2	0
10	Atomic structure- Bohr's model of hydrogen atom	4	2	2	0
11	Spectrum of (H) & hydrogenic and mesic atom	4	2	2	0
12	The nuclear terminology-nuclear radii-binding energy	4	2	2	0
13	Nuclear models- nuclear energy level- the nuclear force	4	2	2	0
14	Radioactive decay – decay process-radioactive dating – radioactive dosimeter	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)	2	10	10%
2	Exam 2 written (Semester work)	4	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Portfolio/ Logbook	9	20	20%

6- Learning Resources and Supportive Facilities *

Learning resources (books,	The main (essential) references	1- D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, 12th ed. Wiley, 2022.

scientific references, etc.)		2- Raymond A. Serway, Chris Vuille, J. Hughes. College Physics Global Edition, 11th ed. Cengage Learning, 2018.
	Other References	1- I. Lyublinskaya et al., College Physics for AP Courses OpenStax. XanEdu Publishing Inc, 2022. 2- W. Sears Richards, Mark W. Zemansky, and Hung D. Young, University Physics, 6th edition, Addison – Wesley 2020
	Electronic Sources (Links must be added)	• http://hyperphysics.phy-astr.gsu.edu/hbase/index.html • https://www.physicsclassroom.com/ • https://en.wikipedia.org/wiki/Physics • https://physicsworld.com/
	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	Whiteboard—whiteboard color pens—eraser
	Other	Scientific Videos

	Course Coordinator	Program Coordinator
Name	Asst. Prof. Mohamad Abd El-Aziz	Prof. Ahmed Abd El-Gafar
Signature	<i>Asst. Prof. Mohamad Abd El-Aziz</i>	

المستوى الثانى (JUNIOR)

فصل دراسى ثالث (تدريب)-نموذج هيئة جديد

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (2)			
Course Code (according to the bylaw):	FTR 161			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	18	-	18
Course Type:	Compulsory			
The level to which the course was introduced:	JUNIOR			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. prof. Amr Hassaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

This course provides professional field training where students engage in engineering practices within institutions, firms, or training centers. Students are expected to apply theoretical knowledge, acquire practical skills, and demonstrate professional

competence through reports, presentations, and discussions with the examination committee.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A2, A4, A8, A10, 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	Interpret and apply the knowledge studied in academic courses to practical engineering tasks.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	LO2	Apply contemporary technologies, codes of practice, and safety rules in performing training tasks.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tool.	LO3	Demonstrate effective communication (oral, written, and graphical) during training activities and presentations.
		LO4	Identify project needs and required materials and report them clearly.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	LO5	Utilize computer-aided design (CAD) systems and adopt self-learning strategies to improve performance.
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to design, build, operate, inspect and maintain mechanical equipment and systems.	LO6	Analyze practical problems in training tasks and propose preventive or corrective solutions.
		LO7	Operate mechanical equipment according to relevant national and international standards and codes.

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:

Scientific topics depend on the defined training field/site

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	Train on the overall mechanical and flowchart of processes	18			18
2	Train on the overall mechanical and flowchart of processes	18			18
3	Carry out research using granted internet sites for references related to students' training process	18			18
4	Mid Exam				
5	Train on how to write scientific report	18			18
6	Write technical report	18			18
7	Review and practice the gained skills	18			18
8	Final Evaluation.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	On site evaluation	3	20	20 %
2	Midterm exam	4	20	20 %
3	Final Oral Exam	8	30	40 %
4	Attendance	7	10	10 %
5	Training report discussion	7	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)	Provided by the training site
	Other References	Training handouts
	Electronic Sources (Links must be added)	According to training site
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show Internet connection
	Supplies	N/A
	Electronic Programs	Microsoft Teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Amr Hassaan	DR. MOHAMED ASHRAF
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Project Management			
Course Code (according to the bylaw):	MNG 201			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	--	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Asmaa Ahmed Soliman			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	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) (according to the matrix in the program specs)		Course Learning Outcomes	
(A7, A9 & A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO1	Identify the fundamental concepts and phases of project management.
		LO2	Explain the role of organizational strategy in project selection and prioritization.
		LO3	Describe how an organization's mission, vision, and strategy influence project planning.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO4	Develop project network schedules using techniques such as Critical Path Method (CPM) and Program Evaluation Review Technique (PERT).
		LO5	Apply core project management principles to minimize project duration and mitigate risks.
		LO6	Analyze the impact of risk management processes on project outcomes.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO7	Schedule project resources and associated costs using appropriate tools.
		LO8	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 (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. 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	Revision and Mid Exam				

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	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)	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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (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. 2. Baudin, M., & Netland, T. (2022). Introduction to manufacturing: An industrial engineering and management perspective. Routledge.
	Other References	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.
	Electronic Sources (Links must be added)	N/A

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show- Dashboard
	Supplies	N/A
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Asmaa Ahmed Soliman	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Electrical Machines and control			
Course Code (according to the bylaw):	EEC 211			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Samir			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Transformers, losses, tests, efficiency and auto transformers. DC machines, DC generator, DC motor, losses and efficiency. AC machine, induction machines, synchronizer machines. Feedback control, poly-phase circuits, distribution and instrumentation.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1,A3,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 engineering fundamentals, basic science, and mathematics.	LO1	Identify the construction of D.C machines, different windings, their merits and demerits
		LO2	Analyze different types of DC generators, their characteristics, industrial applications, effect of armature reaction and its assessment.
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	Evaluate the various losses in DC machines and determine their efficiency
		LO4	Explain the principle of DC motor, electrical characteristics and industrial application, purpose of starter and its design.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO5	Analyze the circuits of different types of DC motors to calculate their power and speed.
		LO6	Analyze the ideal and real circuit operation of transformers and explain energy transfer principles
		LO7	Apply standard transformer tests to evaluate their performance.

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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Principle of Electromechanical Energy Conversion.	4	2	2	
2	Principle of operation for dc machines.	4	2	2	
3	D.C. Generators: Introduction and Principle of operation	4	2	2	
4	Construction of D.C. Generator and E.M.F. Equation of a D.C. Generator.	4	2	2	
5	Types of D.C. Generators and Losses in a D.C. Machine.	4	2	2	
6	Power Stages and efficiency for dc generators with solved examples	4	2	2	
7	Revision and Mid Exam				
8	D.C. Motors: Introduction and Principle of operation.	4	2	2	
9	Construction of D.C. Motors and back E.M.F. Equation of D.C. Motors.	4	2	2	

10	Types of D.C. Motors ,Power Stages and efficiency for dc motors with solved examples	4	2	2	
11	Maximum Power Transfer of D.C Motors, Armature Torque and speed in D.C Motor	4	2	2	
12	Transformer: Introduction, Construction, Principle of Operation, E.M.F Equation	4	2	2	
13	Theory for an Ideal and actual Transformer, Practical and test transformer with solved examples	4	2	2	
14	Mini Project - Practice problems	4	2	2	
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)	5	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 /Portfolio/ Logbook	14	10	10 %

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)	B.L. THERAJA “Text Book of Electrical Technology “, Nirja Construction and Development Company (P) LTD, (2019).
	Other References	- Lectures’ presentations - Lectures’ handouts - Mehta, V. K., and Rohit Mehta. Principles of electrical machines. S. Chand Publishing, 2008.
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	MAT-LAB
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	DR. AHMED SAMIR	DR. MOHAMED ASHRAF
Signature	<i>Ahmed Samir</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Machine Design (1)			
Course Code (according to the bylaw):	ENG 214			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof.: Said H. Zoalfakar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Codes and standards - materials in mechanical design - stress analysis - combined stresses and Mohr's circle - design of different modes of failure – columns – springs - static shaft design – keys - power screw and fasteners (bolted connections, welded joints and machine frame) – seals - pipes, shrink fits and press.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A3&A10, B1, B2, B4		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	Apply stress analysis concepts to determine stresses in mechanical components
		LO2	Select appropriate failure theories for different loading conditions.
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	Develop cost-effective design solutions using suitable mechanical design theories.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Explore engineering design applications and cost considerations through independent learning.
B1	Model, analyze and design material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis.	LO5	Analyze combined stresses in machine elements under operational loading.
		LO6	Evaluate the performance of machine components based on strength and functionality.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software	LO7	Utilize traditional and computer-aided tools to perform material selection and design tasks.

	contemporary to the mechanical engineering field.		
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems.	LO8	Design shafts, fasteners, and structural elements in compliance with national and international standards.

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 machine design, standards and codes	4	2	2	
2	Review of mechanical properties of materials and selection	4	2	2	
3	Stress analysis and Mohr's Circle	4	2	2	
4	Combined stresses and static failure theories	4	2	2	

5	Design of shafts and keys under static loading	4	2	2	
6	Design of springs	4	2	2	
7	Revision and Midterm Exam.				
8	Fatigue failure and endurance limit	4	2	2	
9	Design for fluctuating loads using fatigue criteria	4	2	2	
10	Threaded fasteners and screw design	4	2	2	
11	Power screws and bolted joints	4	2	2	
12	Welded joints – Design and strength analysis	4	2	2	
13	Seal, press and shrink fits – design overview	4	2	2	
14	Design integration and case studies – revision	4	2	2	
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)	5	10	10%
2	Exam 2 written (Semester work or quiz)	10	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments /sheets	Monthly	10	10%
6	Project	13	10	10%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (must be written in full according to the scientific documentation method)	- shigley, J. E., Mischke, C. R., & Brown, T. H. Jr. (2017). <i>Standard handbook of machine design</i> (3rd ed.). McGraw-Hill Education.

references, etc.) *	Other References	• Gupta, R. K. J. (2010). <i>A textbook of machine design</i>. [Publisher not specified]. • Norton, R. L. (2010). <i>Machine design</i> (4th ed.). Prentice Hall. • Smith, W. F. (1996). <i>Principles of materials science and engineering</i> (3rd ed.). McGraw-Hil
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	.Data-show and laptop
	Supplies	N/A
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Said Zoalfakar	Dr. Mohamed Ashraf
Signature	سعيد ذوالفقار	محمد اشرف

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Fluid Power			
Course Code (according to the bylaw):	MEC 212			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mohamed Ashraf			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Introduction to fluid power – Physical properties of hydraulic fluids – Energy & Power in Hydraulic systems – Source of hydraulic Power (Pumps). Hydraulic actuators and motors – Valves and other Control components in hydraulic systems – Hydraulic circuit design and analysis – Introduction to pneumatic systems –Component, circuits and applications – Fluid logic control systems – Electrical control for fluid power circuits.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3,A10, B1, B3)		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 fluid power systems with key relationships manipulation by applying basics of fluid power control.
		LO2	Distinguish between different types of fluid power systems and describe the physical properties of hydraulic fluids.
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 Energy and Power in Hydraulic Systems to calculate the conservation of energy, continuity equation and calculation of losses of flow in pipes.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Analyze applications for hydraulic circuits operations by searching for information to develop knowledge and skills which lead to life-long learning.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Distinguish in analytic way the applications that contain simultaneous hydraulic circuits by applying the basic concepts.
		LO6	Determine the loads of actuators and motors, the losses in the flow pipes and the velocity of extension and retraction of Actuators.
B3	Select conventional mechanical equipment according to the required performance.	LO7	Select the suitable hydraulic pumps, type of fluid, actuators and control valves.

		LO8	Select the design circuit for hydraulic system according to the required performance.

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 fluid power	4	2	2	-
2	Physical Properties of Hydraulic Fluids	4	2	2	-
3	Energy and Power in Hydraulic Systems	4	2	2	-
4	Basic of Hydraulic Flow in Pipeline	4	2	2	-
5	Application of Basic of Hydraulic Flow in Pipeline	4	2	2	-
6	The Source of Hydraulic Power: Pumps	4	2	2	-

7	The Source of Hydraulic Power: Pumps	4	2	2	-
8	Revision and Mid Exam				
9	Hydraulic Actuators and Motors	4	2	2	-
10	Hydraulic Actuators and Motors	4	2	2	-
11	Valves and Other Control Components in Hydraulic Systems	4	2	2	-
12	Valves and Other Control Components in Hydraulic Systems	4	2	2	-
13	Hydraulic Circuit Design and Analysis	4	2	2	-
14	Hydraulic Circuit Design and Analysis	4	2	2	-
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)	9	10	10%
3	Exam 3 written (Semester work or quiz)	11	10	10%
4	Term Paper	12	10	10%
5	Midterm exam	8	20	20 %
6	Final Written Exam	15, 16	40	40 %

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)	- Esposito, A. (2020). <i>Fluid Power with Applications</i> (9th ed.). Pearson. - Abu Hanieh, A. (2021). <i>Fluid Power Control</i> (2nd ed.). Jerusalem.
	Other References	Bansal, R. K. (2018). <i>A Textbook of Fluid Mechanics and Hydraulic Machines</i> . Laxmi Publications.
	Electronic Sources (Links must be added)	Microsoft teams
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	Festo Program
	Other (to be mentioned)	-----

	Course Coordinator	Program Coordinator
Name	Dr. Mohamed Ashraf	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Theory of machines (2)			
Course Code (according to the bylaw):	ENG 212			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mostafa Abd El-Galil Mohamed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

The course covers the dynamics of machines and linkage (using energy method) Design of flywheel. Balancing of rigid and flexible rotors. Balancing of reciprocating engine. Mechanical vibration (single- degree of freedom system).

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, 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 solution methods for single-degree-of-freedom dynamic systems.
		LO2	Conduct force analysis in mechanisms using the principle of virtual work.
		LO3	Explain the performance characteristics of flywheels.
		LO4	Formulate the linearized equation of motion for single-degree-of-freedom vibration systems.
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.	LO5	Apply virtual work principles to the design of dynamic mechanical systems.
		LO6	Calculate balancing masses and positions for rotating components.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics, and Vibrations.	LO7	Analyze equilibrium and dynamic forces in machine components.
		LO8	Design a flywheel based on energy fluctuation and speed regulation.
		LO9	Model damping systems in vehicles using vibration theory.

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	Dynamic of single degree of freedom system	4	2	2	-
2	Coordinates and constraints, virtual displacement, generalized force, principal of virtual work.	4	2	2	-
3	Methods of solution of dynamical systems (accelerating force method, inertia force method, work and energy method).	4	2	2	-
4	Steady motion of a machine: flywheel analysis	4	2	2	-
5	Continue Steady motion of a machine: flywheel analysis	4	2	2	-
6	Continue Steady motion of a machine: flywheel analysis	4	2	2	-
7	Revision and Mid Exam				
8	Continue Steady motion of a machine: flywheel analysis	4	2	2	-
9	Balancing : introduction, concepts and principles of reciprocating and rotating balancing.	4	2	2	-

10	Balancing of rotting machines: introduction, concepts and principles of rigid rotor balancing – mathematical analysis, balancing of two rotating masses lying (in the same plane)	4	2	2	-
11	Balancing of rotting machines: mathematical analysis, balancing of serval rotating masses lying (in the same plane).	4	2	2	-
12	Balancing of rotting machines: mathematical analysis, balancing of serval rotating masses lying (in serval planes).	4	2	2	-
13	Introduction to mechanical vibration :Linear undamped vibrating system (free response).	4	2	2	-
14	Linear undamped vibrating system (free response).	4	2	2	-
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)	9	10	10%
	Exam 3 written (participations)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
7	Assignments / Project	Monthly	10	10%

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)	Uicker Jr, J.J., Pennock, G.R. and Shigley, J.E., (2023). Theory of machines and mechanisms. Cambridge University Press.
	Other References	Gupta, B. V. R. (2010). Theory of Machines: Kinematics and Dynamics. IK International Pvt Ltd.
	Electronic Sources (Links must be added)	Course notes are available to the students on the copy center of the Institute and Microsoft teams.

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mostafa Abd El-Galil Mohamed	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Environmental Impacts of Projects			
Course Code (according to the bylaw):	MNG 202			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 1	Theoretical	Practical	Other (Tutorial)	Total
	1	-	-	1
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwaly			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

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) (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 (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 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	-	-	

10	Review and licensing	1	1	-	-	
11	Quiz 2 - Review and licensing (continued)	1	1	-	-	
12	Monitoring and Auditing	1	1	-	-	
13	Monitoring and Auditing (continued)	1	1	-	-	
14	Case Study	1	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)	According to schedule	15	15%
2	Exam 2 written (Semester work)	According to schedule	15	15%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	40	40%
5	Assignments / Reports /case study	According to schedule	10	10%

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)	John Glasson, Riki Therivel and Andrew Chadwick, Introduction to Environmental Impact Assessment, 4th edition, 2012.
	Other References	- Thom B. Fischer, "Strategic Environmental Assessment in Transport and Land Use Planning", 1st edition, 2023, - Barbara Carroll, Josh Fothergill, Jo Murphy, and Trevor Turpin, "Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities", Third edition, 2019 - Peter Morris and Riki Therivel,

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

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

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Introduction to Accounting			
Course Code (according to the bylaw):	HUM 201			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Ahmed Abd El-Gafar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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).

Program Outcomes (NARS) (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.	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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 & documents different types of revenues & expenditure	2	2	0	0
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	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	
2	Exam 2 written (Semester work)	11	10	
3	Midterm exam	7	20	20 %
4	Final Written Exam	14	40	40 %
7	Assignments / Project /Portfolio/ Logbook	10,12	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	Mohamed Sabri El Attar, Mansoura Hamed& Ahmed El-Sabagh, Principles of financial Accounting, Cairo University.2020
	Electronic Sources (Links must be added)	• https://www.oreilly.com/library/view/financial-accounting-in/9780470635292/ch03sec3.html • https://www.coursera.org/learn/financial-accounting • https://open.umn.edu/opentextbooks/textbooks/640/
	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.

	Course Coordinator	Program Coordinator
Name	Prof. Ahmed Abd El-Gafar	Prof. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	English Literature			
Course Code (according to the bylaw):	HUM 202			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mai Abouzaid			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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) (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 English words.	LO1	Enhance students' abilities in reading English Literature
		LO2	Developing reading strategies for different purposes.
		LO3	Study different types and genres of English Literature(poetry, novel, drama and short stories).
		LO4	Work effectively in team of multi-disciplinary or multi-culture.
A9	Communicate effectively, verbally and in writing with a range of audiences.	LO5	Apply the four skills of language freely with particular emphasis on dealing with literary works.
A10	Acquire and apply new knowledge and practice through English language.	LO6	Express themselves in English with confidence, especially while evaluating and criticizing the literary work.
		LO7	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Shakespeare's Poems	2	2	0	0
10	Christopher Marlowe's Poems	2	2	0	0
11	Supplementary Material and Quiz	2	2	0	0
12	Supplementary Material and Quiz	2	2	0	0

13	Presentations	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	14	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)	"English Literature"; HTI; Available Hard copy. Available Presentation (handed to students' part by part).
	Other References	1- History of English Literature by Edward Albert. London: Routledge, 2019. 2- Arabic Literature in Translation. Cairo: The American University in Cairo, 2022. 3- The Complete Works of William Shakespeare. London: Canterbury Classics, 2023. 4- The Norton Anthology of World Literature. London: Norton, 2023.
	Electronic Sources (Links must be added)	https://englishworld.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
	Supportive facilities & equipment	
	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.

for teaching and learning *	Other (to be mentioned)	Notebook and data show equipped lecture room.

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

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Trade Law			
Course Code (according to the bylaw):	HUM 203			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Ahmed Abd El-Gafar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A7,A8,A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO1	Assess issues of the latest knowledge about the concepts, characteristics, and types of contracts, contract constituents
		LO2	Explain the main principle of Role of contracts: concept, attributes, and principles
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Elucidate the main principal Dynamic nature of contract administration,
		LO4	Clarify the main principal-of limitations as imposed by law,
		LO5	Design the , the legal variables encountered in business
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO6	Solving problems related to commercial transactions.
		LO7	Evaluating search results, the limitations as imposed by law,
		LO8	Describe the main concepts of the basics of the legal variables encountered in business and commercial transactions.
		LO9	Working in a team group
		LO10	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Fundamental of definition concepts, characteristics Trade Law - 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	Revision and Mid Exam				

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	Supplementary materials 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	14	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	محمد عبد الكريم يوسف- "الصياغة القانونية للعقود التجارية، 2021
	Electronic Sources (Links must be added)	https://www.edx.org/learn/business-administration
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities &	Devices/Instruments	Notebook and data show equipped lecture room.

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

	Course Coordinator	Program Coordinator
Name	Prof. Ahmed Abd El-Gafar	Prof. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Entrepreneurship			
Course Code (according to the bylaw):	Hum 206			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	--	--	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Moataz Mohamed Abd El-Raouf			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	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) (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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical Lab /
1	*Definition of Entrepreneurship. *What is meant by: Entrepreneur? * Competencies of entrepreneur.	2	2	-	-
2	*Main processes of Entrepreneurship. *The difference between entrepreneurship projects and small enterprises. *Inspiring Entrepreneurs Story of KINGINE Founders.	2	2	-	-
3	*The role of entrepreneurship and small enterprises in the development of the economy of countries. *Classification of different types of pilot projects.	2	2	-	-
4	*Entrepreneurship between science and talent. *Success story of an entrepreneur (jewellery designer Azza Fahmi).	2	2	-	-
5	Stages of Entrepreneurship Process: *Identify and evaluate the opportunity. *Develop business plans. *Resources required. *Manage the enterprise. Success story of an entrepreneur: Nike	2	2	-	-

6	-Entrepreneurial problems. -Why do so many small projects fail? + Online Quiz	2	2	-	-
7	Revision and Mid Exam				
8	-Success stories of Ingvar Kaber: IKEA Founder. -Definition of: Business incubators including its Importance.	2	2	-	-
9	-Basic services provided by business incubators. -Classification of Business incubators. -Proportions of services provided by business incubators.	2	2	-	-
10	-Examples Global and local Business incubators -success stories of El Araby Group. + Online Quiz	2	2	-	-
11	Entrepreneurial Project Presentations	2	2	-	-
12	Entrepreneurial Project Presentations	2	2	-	-
13	Entrepreneurial Project Presentations	2	2	-	-
14	Revision	2	2	-	-
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)	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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Nieuwenhuizen, C. <i>Basics of entrepreneurship</i>. Juta and Company Ltd. (2004). - Kuratko, D. F. <i>Entrepreneurship: Theory, process, and practice</i>. Cengage learning.(2016)
	Other References	Singh, S. K., and Sanjay Gupta. <i>Entrepreneurship: E-book</i> . SBPD Publications, 2016.
	Electronic Sources (Links must be added)	https://guides.erau.edu/entrepreneurship/websites
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr.Moataz Mohamed Abd El-Raouf	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Scientific Thinking			
Course Code (according to the bylaw):	HUM 207			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr./ Mustafa Muhammad Fadel			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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) (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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Revision and Mid Exam				
8	Scientific analysis and linking between variables	2	2	0	0
9	Suggest scientific solutions to practical problems	2	2	0	0
10	levels of thinking and scientific thinking techniques	2	2	0	0
11	Ethical standards of scientific research.	2	2	0	0
12	The impact of innovative thinking on management in organizations and change management	2	2	0	0
13	The impact of innovative thinking on management in organizations and change management	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	Exam 1 written (Semester work)	5	10	10 %
2	Exam 2 written (Semester work)	9	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	14	40	40 %
5	Final Oral Exam	12	10	10 %
6	Assignments / Project /Portfolio/ Logbook	12	10	10 %

6- Learning Resources and Supportive Facilities *

Learning resources	The main (essential) reference	Available Presentation (handed to students' part by part).

(books, scientific references, etc.) *	(must be written in full according to the scientific documentation method)	
	Other References	• Michael E Gorman; “Scientific and Technological Thinking” 2005 by Lawrence Erlbaum Associates • Richard Paul, Linda Elder: The Miniature Guide to Scientific Thinking; 2023
	Electronic Sources (Links must be added)	• https://www.youtube.com/watch?v=pOb_jKqy_s0&ab_channel=Flippin%27ScienceVideos • https://study.com/learn/lesson/scientific-thinking-process-examples.html
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	
	Skill Labs/ Simulators	x
	Virtual Labs	x
	Other (to be mentioned)	x

	Course Coordinator	Program Coordinator
Name	Dr./ Mustafa Muhammad Fadel	PROF. Ahmed Abdel Ghafar
Signature	<i>Mustafa Muhammad Fadel</i>	

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Business Administration			
Course Code (according to the bylaw):	HUM 208			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Ahmed Abd El-Gafar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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).

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

		LO9	Maintain the high ethical standards of business work.
		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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Control function.	2	2	0	0
10	Management levels and skills required for each level.	2	2	0	0
11	Administrative communication process.	2	2	0	0
12	Supplementary materials and Quiz	2	2	0	0
13	Presentations	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	14	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-Mohamed Abdallah Abd El Rehim, Fundamental of Management & Organization, Cairo University.2022 2-El Desouky Hamed Abou Zeid, the Scientific Fundamentals of Management, Cairo University.2022
	Electronic Sources (Links must be added)	https://www.ecpi.edu/blog/what-is-business-administration-all-about https://www.edx.org/learn/business-administration

	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.

	Course Coordinator	Program Coordinator
Name	Prof. Eid Abd El-Baset Eid	Prof. Ahmed Abd El-Gafar
Signature	Eid Abd El-Baset Eid	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Heat and Mass transfer			
Course Code (according to the bylaw):	MEC 223			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Shabban			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Fundamentals of heat transfer by conduction; steady and unsteady, convection forced and natural, radiation, mass transfer; fundamental and operations. Analysis of industrial heat and mass transfer operations. Equipment design. Temperature and heat flux measurements, boiling and evaporation, conduction, convection, heat exchanger.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1 & A3 & A10&B1 & B3)		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 heat and mass transfer rate calculations with key relationships manipulation by applying basics of heat and mass transfer.
		LO2	Distinguish the different shapes for conduction heat transfer in one dimension (steady and unsteady) and two dimensions.
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 suitable correlations to calculate the rate of convection heat transfer (forced & free) and radiation heat transfer.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Analyze applications for heat and mass transfer operations by searching for information to develop knowledge and skills which leading to life-long learning.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Distinguish in analytic way the applications that contain simultaneous heat and mass transfer by applying the basic concepts.
		LO6	Determine the rate of boiling and condensation heat transfer.

B3	Select conventional mechanical equipment according to the required performance.	LO7	Select the suitable type of heat exchangers.
		LO8	Select the design method for conventional heat exchangers according to the required performance.

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 heat and mass transfer.	4	2	2	
2	-One-dimension steady conduction heat transfer without heat generation. -One-dimension steady conduction heat transfer with heat generation.	4	2	2	
3	-Extended surfaces (Fins). -One-dimension un-steady conduction heat transfer. -Two-dimension steady conduction heat transfer.	4	2	2	
4	External forced convection (Laminar and turbulent flow over flat plate).	4	2	2	

5	External forced convection (Flow across single tube)	4	2	2	
6	Internal forced convection (Laminar and turbulent flow inside tube).	4	2	2	
7	Revision and Mid Exam				
8	External forced convection (flow across tube bank).	4	2	2	
9	Basic concepts of natural convection and radiation heat transfer.	4	2	2	
10	Heat exchangers (Basic concepts, its types, and heat balance equations).	4	2	2	
11	Design of Heat exchangers by two different methods (LMTD method and ϵ -NTU method).	4	2	2	
12	concepts of diffusion and convection mass transfer. -Simultaneous heat and mass transfer applications.	4	2	2	
13	-Different correlations for Boiling and Condensation heat transfer. -Different correlations for Boiling and Condensation heat transfer.	4	2	2	
14	-Revision for part 2.	4	2	2	
15,16	Final Exam.				

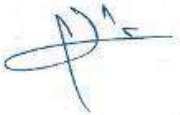
5- Methods of students' assessment:

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

5	Final Practical/Clinical/... Exam	-	-	-
6	Final Oral Exam	-	-	-
7	Assignments / Project /Portfolio/ Logbook	2,4,6,9	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)	-Lecture notes available to the students on copy center of the Institute. -Yunus A. Cengle and Afshin J. Ghajar "Heat and mass transfer: Fundamentals & Applications.", 6 th edition , McGraw Hill Education,2020. -J.P. Holman "Heat transfer", Tenth edition, McGraw Hill Education, 2010.
	Other References	Rajm.Manglik,Mark.S.Bohn, —Principles of Heat TransferI, Library of Congress,7th ed,(2011)
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Shabban	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Production Technology 2			
Course Code (according to the bylaw):	ENG 221			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Abdou Abdallah Hassan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

By the end of this course the student must be taught:

Casting, sand casting (pattern and core making design, foundry sand, gating system design) gravity die casting, pressure die casting, centrifugal casting, lost-wax casting, continuous casting, new casting technique, casting finishing, inspection, testing and defects. Metal forming, theory of plasticity, flow curve, blanking and piercing, rolling,

forging, extrusion, deep drawing, powder metallurgy. Casting workshop, prepare a mold for pouring and gating system design, metal fluidity, testing of sand casting, calculation of furnace charge. Metal forming workshop, flow curve determination (tension test and compression test), design of punch and die for blanking and piercing.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A10, B1 & 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	Identify the main types and steps of sand casting and metal forming processes.
		LO2	Compare various manufacturing techniques in casting and forming through lab observations and design activities.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO3	Analyze the application of forming forces in wire drawing using experimental data.
		LO4	Evaluate the force requirements in metal forming operations using plasticity theory and flow curves.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Investigate common casting defects and correlate them to casting parameters using analytical methods.
		LO6	Calculate dimensions of the gating system for different casting operations based on fluidity and pouring rate.
		LO7	Select the appropriate gating and feeding system for a specific casting application.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using	LO8	Choose the suitable type of melting furnace based on the casting alloy and required production rate.

	appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to metal forming – Theory of plasticity – Flow curve determination	4	2		2
2	Sheet metal forming (blanking, piercing) – Punch and die design	4	2		2
3	Deep drawing and extrusion – Defects in formed parts	4	2		2
4	Bulk forming operations – Wire drawing – Application of forming forces	4	2		2
5	Rolling and forging – Flow stress analysis	4	2		2
6	Powder metallurgy – Comparison with traditional forming	4	2		2

7	Revision and Mid Exam				
8	Introduction to casting – Sand casting (pattern, core making, mold types)	4	2	-	2
9	Gating system design – Foundry sand testing – Fluidity	4	2	-	2
10	Permanent mold casting – Gravity, pressure, and centrifugal casting	4	2	-	2
11	Lost-wax casting – Continuous casting – Furnace charge calculation	4	2	-	2
12	Melting furnaces – Furnace selection criteria	4	2	-	2
13	Casting defects – Defect analysis and inspection methods	4	2	-	2
14	Review of forming and casting – Case studies and applications	4	2		2
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Flow curve determination (tension test)
2	Flow curve determination (compression test)
3	Design of punch and die for blanking and piercing
4	Bulk forming, wire drawing
5	Rolling
6	Defects of metal forming products
7	Casting workshop, prepare a mold for pouring
8	Testing of sand casting, (Tension, compression and shear test of sand)
9	Metal fluidity test (spiral 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 or quiz)	4	10	10 %
2	Exam 2 written (Semester work or quiz)	9	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical Project Exam	13	10	10 %
6	Assignments	6 & 10	10	10 %

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)	Groover, M. P. "Fundamentals of modern manufacturing: materials, processes, and systems". John Wiley & Sons, 7th edition (2019)
	Other References	- Campbell, JS "Principles of Manufacturing Materials and Processes", McGraw Hill, New York, (2018). P. N. Rao, "Manufacturing Technology", McGraw-Hill, (2005)
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	N/A
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	Metal forming and Casting Lab.

	Course Coordinator	Program Coordinator
Name	Dr Abdou Abdallah	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Mechanical Vibration			
Course Code (according to the bylaw):	ENG 222			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mahmoud Essam Elsaify			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Free and damped vibrations, harmonically excited motion, rotating and reciprocating unbalance, free and forced vibration of a single degree of freedom system. Vibration of multi degree of freedom system, vibration of continuous system (beams). Approximate methods. – Vibration measurements.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B1, B3)		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 values of spring constants, masses, and damping constants of a vibration system using various methods.
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.	LO2	Formulate the equation of motion of the vibration systems (free or forced) using various techniques.
		LO3	Apply suitable correlations to calculate the parameters of vibratory system parts for the vibration systems (forced & free).
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO4	Analyze applications for vibration systems by searching for information to develop knowledge and skills which lead to life-long learning.
		LO5	Distinguish in an analytic way the applications that contain vibration motion by applying the basic concepts.
		LO6	Model different vibration systems (translation and rotation) and estimate their equation of motion.
B3	Select conventional mechanical equipment according to the required performance.	LO7	Analyze the vibration systems behavior.
		LO8	Select the accelerometer to measure the amplitude, velocity and acceleration of the vibrating body according to the required performance.

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	Fundamentals of vibration systems: - Fundamental concepts - Vibration system elements - Mathematical modeling - Harmonic analysis	4	2	2	--
2	Single DOF free vibrating system: - Equation of motion derivation – undamped system - Equation of motion derivation – damped system - Torsional system Logarithmic decrement method	4	2	2	--
3	Single DOF free vibrating system: Equation of motion derivation – undamped system	4	2	2	--

	- Equation of motion derivation – damped system - Torsional system - Logarithmic decrement method				
4	Harmonically excited vibrating system: - Damped and un-damped systems - Beating phenomena - Base-excitation Unbalance as the main cause of vibration	4	2	2	--
5	Harmonically excited vibrating system: - Damped and un-damped systems - Beating phenomena - Base-excitation Unbalance as the main cause of vibration	4	2	2	--
6	Vibration under general forcing conditions: - Periodic force - Convolution integral Laplace transform	4	2	2	--
7	Revision and Mid Exam				
8	Vibration under general forcing conditions : - Periodic force - Convolution integral - Laplace transform	4	2	2	--
9	Two Degree of Freedom System: - Equation of motion - Damped and undamped systems - Free and forced systems Torsional system	4	2	2	--
10	Two Degree of Freedom System: - Equation of motion - Damped and undamped systems - Free and forced systems Torsional system	4	2	2	--
11	Multi-degree of freedom systems: 3-degree of freedom - Molding continues system as multi DoF system - Natural frequencies and mode shapes Dunkerley's Formula	4	2	2	--
12	Rotating and reciprocating unbalance	4	2	2	--

13	Vibration of continuous systems (beams)	4	2	2	--
14	Vibration measurements - Balancing of rotating machinery - Whirling of shafts - Vibration isolation and absorbers Introduction to vibration measurements in field	4	2	2	--
15,16	Final Exam.				

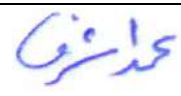
5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	5	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 %
5	Assignments	Monthly	10	10%

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)	Singiresu, S. Rao. "Mechanical Vibrations.", 8th edition, Pearson, 2020
	Other References	- Mechanical Vibration: Theory and Application, S. Graham Kelly, Cengage Learning, 2011 - Introductory Course on Theory and Practice of Mechanical Vibration, J. S, Rao, J.K. Gupta, New Age International, 1999. - Vibration Fundamentals and Practice, C. W. Silva, CRC Press 1999
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for	Devices/Instruments	N/A
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A

teaching and learning *	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mahmoud Essam Elsaify	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Materials			
Course Code (according to the bylaw):	ENG 224			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mahmoud Essam Elsaify			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Ferrous alloys, plain carbon steels, conventional heat treatments, alloy steels, stainless steel, cast irons. Nonferrous alloys, aluminum, copper, nickel, magnesium and titanium alloys. Ceramic materials, structure and properties, processing of ceramics, applications.

Polymers, structure and properties; polymer processing technology, elastomers. Composite materials, particulate reinforced, fiber reinforced and laminar composites.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A2, A3, B1, B2, B4		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 properties and applications of different types of steel, cast iron, nonferrous alloys, ceramics, polymers and composites.
		LO2	Interpret binary phase diagrams.
		LO3	Describe Iron-carbon phase diagram and structural constituents of ferrous alloys.
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	Apply material engineering concepts to enhance the mechanical and physical properties of engineering materials.
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.	LO5	Evaluate the structural changes during heat treatment process.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the	LO6	Analyze the effect of different alloying elements on the structure and properties of steel.

	concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO7	Analyze relevant information from phase diagrams and the type of failure from different fractures surfaces.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO8	Plan for new materials according to the required applications need.
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to design, build, operate, inspect and maintain mechanical equipment and systems.	LO9	Select the appropriate material for a specific application.

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 Engineering Materials.	4	2	2	--
2	Fe-C phase diagram (part 1)	4	2	2	--
3	Fe-C phase diagram (part 2)	4	2	2	--
4	Ferrous alloys, plain carbon steels	4	2	2	--
5	Ferrous alloys, plain carbon steels	4	2	2	--
6	Conventional heat treatments of plain C-steels, isothermal transformation diagrams, continuous cooling transformation diagrams.	4	2	2	--
7	Revision and Mid Exam				
8	Simple heat treatments.	4	2	2	--
9	Effect of alloying elements, hardenability, Alloy steels, stainless steels, cast irons.	4	2	2	--
10	Cast irons. & Stainless steels.	4	2	2	--
11	Nonferrous alloys, aluminum, copper alloys Nickel, magnesium and titanium alloys	4	2	2	--
12	Ceramic materials & Polymers	4	2	2	--
13	Composite materials	4	2	2	--
14	Revision and overview of the course	4	2	2	--
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)	5	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 %
5	Assignments	14	10	10%

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)	-D. Askeland, " The Science and Engineering of Materials " Brooks/Cole , Eng. Division ,2019.
	Other References	-William F. Smith, Fundamentals of materials science and engineering "; McGraw-Hill, Third Edition, 2004. -Askeland , — The Science and Engineering of Materials — Brooks/Cole , Eng. Division ,1984
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	N/A
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mahmoud Essam Elsaify	Dr. Mohamed Ashraf
Signature		

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:
نظري	عملي	أخرى (تحديد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
٢			٢	
إجباري				نوع المقرر:
SENIOR 1				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
د/ سلوي 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 (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A3,A4,A5,A7,A8)	
الكود	النص	الكود	النص
A3	LO1 يفهم أهمية التفاوض	A3	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.
	LO2 يتعرف علي مبادئ واسس التفاوض		
	LO3 اكتساب مهارات الحوار والنقاش البناء		
A4	LO4 اكتساب مهارات المعرفة من خلال الانترنت	A4	الاستفادة من التقنيات المعاصرة وقواعد الممارسة والمعايير وإرشادات الجودة ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.
	LO5 اكتساب مهارات التواصل الجيد مع الآخرين		
	LO6 اكتساب مهارات العمل مع فريق		
	LO7 التعاون والتعامل مع الآخرين		
A5	LO8 اكتساب مهارات التواصل الجيد مع الآخرين	A5	ممارسة تقنيات البحث وطرق التحقيق كجزء متاصل من التعلم.
A7	LO9 القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية	A7	العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعددة الثقافات.
A8	LO10 القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية	A8	التواصل الفعال -بباني ولفظيا وخطيا - مع مجموعة من الجماهير باستخدام الأدوات المعاصرة.

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	المعمل الافتراضية	التعلم الإلكتروني	النكاه الإصطناعي في التعليم
√			√		√	√	√			√	√			√	√

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس 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 (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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	تكليفات / مشروع / ملف الإنجاز / كتيب الأنشطة	طوال الفصل	20	20 %

6- مصادر التعلم والتسهيلات المادية:

1- د. مجدي عبد الله شرارة .. دليل المفاوض المثالي، مؤسسة فريدريش أبيرت، مكتب مصر، القاهرة، الطبعة الأولى 2016 2- عروض تقديمية (يوربوينت) عن المقرر، يعطى للطلاب جزءاً بجزء.	المرجع الأساسي للمقرر (لا بد من كتابة البيانات كاملة وفقاً لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
1 - باترسون، جيمس ج. كيف تصبح مفاوضاً ناجحاً؟ الرياض: مكتبة جرير، 1999 2 - محسن الخضيرى: تنمية المهارات التفاوضية، القاهرة، الدار المصرية اللبنانية، 1993	المراجع الأخرى	
• https://ar.wikipedia.org/wiki • http://www.du.edu.eg/ • https://www.youtube.com/watch?v=bnCua19M_EA	المصادر الإلكترونية (لا بد من إضافة الروابط)	
EKB - Microsoft office General HUM 204 مبادئ التفاوض Microsoft Teams	المنصة التعليمية (لا بد من إضافة الرابط)	
الوسائل التعليمية (داتا شو) وجهاز كمبيوتر محمول	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
باور بوينت يحتوي المادة العلمية تقدم بشكل دوري للطلاب	المستلزمات	
Microsoft Teams	البرامج الإلكترونية	
-	معامل المهارات/ المحاكيات	
-	المعامل الافتراضية	
-	أخرى (تذكر)	

منسق البرنامج	منسق المقرر	
أ.د/ أحمد عبد الغفار	د/ سلوي محمد عبد المحسن	الإسم
		التوقيع

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: (تبعاً لما ورد باللائحة)
1		1	2	
اجباري				نوع المقرر:
SENIOR 1				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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 مزاوله 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 (التي يحققها المقرر تبعاً للمصنوفة 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 الاسس 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 الاعمال 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 لوجيا المعلومات				التدريس الغير مباشر								التدريس 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 الأسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
1	المقدمة ومفهوم عن علم الهندسة الرياضية /هدفها /اهميتها + 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 والمصطلحات الخاصة بالحركة) + التدريب على اختبارات اللياقة	2	1	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	الجهاز الحركي(تركيب العضلة/انواع العضلات)+ تدريبات على اللياقة البدنية	2	1	0
9	الاعتبارات الخاصة باختيار الموقع (المنشأة الرياضية) + تدريبات على اختبارات اللياقة البدنية	2	1	0
10	الاشتراطات العامة لتصميم المنشآت الرياضية + تدريبات على اختبارات اللياقة البدنية	2	1	0
11	التقنيات الحديثة في معالجة المياه + تدريبات على اللياقة البدنية	2	1	0
12	علم النفس الرياضي (الاجهزة الحديثة للتدريب العقلي) + تدريبات على اللياقة البدنية	2	1	0
13	إختبارات الفصل الدراسي النهائية عملي			

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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 حسن دار المعرفة 2020م	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
تطبيقات البيوميكانيك في التدريب والاداء صريح عبد الكريم دار دجلة الطبعة الاولى 2019م	المراجع الأخرى	
• https://ar.wikipedia.org/wiki • https://ar.wikipedia.org/wiki	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
قاعة محاضرات مجهزة .	1	التجهيزات التعليمية المساندة للتعليم والتعلم *
المكتبات المركزية والفرعية.	2	
الوسائل التعليمية (داتا شو) وجهاز كمبيوتر محمول.	3	
مذكرة لتدريس المقرر وكشوف متابعة للطلاب	4	

منسق البرنامج	منسق المقرر	
ا.د/ أحمد عبد الغفار	د.خلود فاروق حامد	الإسم
	خلود فاروق حامد	التوقيع

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:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1			1	
اجباري				نوع المقرر:
SENIOR 1				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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) :

يتناول المقرر الآتي: الألام 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 المصري من حقوق الإنسان ، والحماية القانونية لها على الصعيد الوطني والصعيد الدولي ، بالإضافة الى حقوق الإنسان في الشريعة الإسلامية – الاصول التاريخية الفلسفية لحقوق الإنسان – المصادر الدولية لحقوق الإنسان (العالمية والاقليمية) – المصادر الوطنية لحقوق الإنسان – الاجهزة العالمية القائمة على حماية حقوق لانسانا (أجهزة الامم المتحدة) – الحماية الوطنية لحقوق الإنسان – حقوق الإنسان في الشريعة الإسلامية – عرض لبعض طوائف الإنسان – مراجعة عامة .

3- نواتج التعلم للمقرر:

تساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A3- A8- A10)	
النص	الكود	النص	الكود
معرفة الحقوق الأساسية للإنسان والتي لا يحيا بدونها.	LO 1	تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الإحتياجات 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
معرفة ماله من حقوق وما عليه من واجبات.	LO 2		
معرفة دوره في بناء مجتمعه.	LO 3		
المقارنة بين المراحل المختلفة لتطور حقوق الإنسان في الديانات السماوية والنظم الوضعية.	LO 4	التواصل بفعالية بآليات شفافة وكتابة، مع مجموعات من الجماهير باستخدام الأدوات العصرية.	A 8
معرفة حقوق المواطنة وحقوق الوطن على المواطن.	LO 5		
معرفة حقوق البيئة وضرورة الحفاظ عليها وعلاقتها بحقوق الإنسان.	LO 6		
معرفة أنواع الفساد ودوره في إهدار حقوق الإنسان.	LO 7	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.	A 10
معرفة دور الشباب في مقاومة الفساد وطرق مقاومته.	LO 8		
الممارسة الصحيحة لما له من حقوق وما عليه من واجبات.	LO 9		
تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل في ضوء معرفته لمنظومة الحقوق والواجبات.	LO10		

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 الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس نظري	تدريب	
					تمارين
1	تقديم عن المقرر وتعريف أهميته في حياة الطالب.	1	1	0	0
2	حقوق نفسك عليك، ما هي؟ وكيف تؤديها؟	1	1	0	0
3	- تعريف حقوق الإنسان وخصائصها. - أنواع حقوق الإنسان.	1	1	0	0
4	التطور التاريخي لحقوق الإنسان وحريته.	1	1	0	0
5	- حقوق الإنسان في الشرائع السماوية. - إهدار حقوق الإنسان في الولايات المتحدة الأميركية.	1	1	0	0
6	حقوق الأبناء على الآباء.	1	1	0	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	- حقوق الأزواج والزوجات وتأسيس أسرة صالحة. - حقوق الآباء على الأبناء.	1	1	0	0
9	حقوق الوطن.	1	1	0	0
10	- الانتماء للوطن. - حقوق البيئة.	1	1	0	0
11	- حقوق اللغة العربية. - الفساد وإهدار حقوق الإنسان. (1)	1	1	0	0
12	- الفساد وإهدار حقوق الإنسان. (2) - دور الشباب في مكافحة الفساد. (1)	1	1	0	0
13	دور الشباب في مكافحة الفساد. (2)	1	1	0	0
14	مراجعة عامة.	1	1	0	0
16-15	اختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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	15	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	وليد رضوان، حقوق الإنسان، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان.
المراجع الأخرى	1- خديجة النبراوي: موسوعة حقوق الإنسان في الإسلام، دار السلام للطباعة والنشر والتوزيع، القاهرة. 2015 2- محمد الغزالي: حقوق الإنسان بين تعاليم الإسلام وإعلان الأمم المتحدة، القاهرة، دار الكتب الإسلامية، 1984 3- محمد عمارة: الإسلام وحقوق الإنسان، الكويت، سلسلة عالم المعرفة، عدد مايو 1985 4- محي شوقي أحمد: الجوانب الدستورية لحقوق الإنسان (رسالة دكتوراة، جامعة عين شمس، 1986)
المصادر الإلكترونية (لا بد من إضافة الروابط)	1- https://ar.wikipedia.org/wiki 2- http://www.du.edu.eg/ 3- https://www.youtube.com/
المنصة التعليمية (لا بد من إضافة الرابط)	https://www.ekb.eg/ar/home
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 المساعدة للتعليم والتعلم *

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

المستوى الثالث (SENIOR 1)

فصل دراسي ثالث (تدريب)-نموذج هيئة جديد

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (3)			
Course Code (according to the bylaw):	FTR 231			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	18	-	18
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. prof. Amr Hassaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

This is specialized training in which the students' studies, the integrated systems of the various production units, as well as the considerations of industrial safety within the factory. The duration of the industrial training is eighteen hours per week spread over a minimum of five days for one academic term.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A4, A5, A8, A10, B2)		Upon completion of the course, the student will be able to:	
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	Apply safety rules, quality standards, and environmental considerations during industrial training.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO2	Investigate industrial problems using appropriate research and data collection methods.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tool.	LO3	Demonstrate effective communication skills (written, verbal, and graphical) with supervisors and colleagues.
		LO4	Identify the needs and required materials for assigned industrial tasks.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	LO5	Utilize computer-aided design (CAD) systems to support assigned tasks.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO6	Manage the design and implementation of mechanical systems using appropriate tools and materials.

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:

Scientific topics depend on the defined training field/site

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	Train on the overall mechanical and flowchart of processes	18			18
2	Train on the overall mechanical and flowchart of processes	18			18
3	Carry out research using granted internet sites for references related to students' training process	18			18
4	Mid Exam				
5	Train on how to write scientific report	18			18
6	Write technical report	18			18
7	Review and practice the gained skills	18			18
8	Final Evaluation.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	On site evaluation	3	20	20 %
2	Midterm exam	4	20	20 %
3	Final Oral Exam	8	30	40 %
4	Attendance	7	10	10 %
5	Training report discussion	7	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)	Provided by the training site
	Other References	Training handouts
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show Internet connection
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Dr. Amr Hassaan	DR. MOHAMED ASHRAF
Signature		

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A3&A10, B1, B2, B4		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	Apply stress analysis concepts to determine stresses in mechanical components
		LO2	Select appropriate failure theories for different loading conditions.
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	Develop cost-effective design solutions using suitable mechanical design theories.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Explore engineering design applications and cost considerations through independent learning.
B1	Model, analyze and design material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis.	LO5	Analyze combined stresses in machine elements under operational loading.
		LO6	Evaluate the performance of machine components based on strength and functionality.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software	LO7	Utilize traditional and computer-aided tools to perform material selection and design tasks.

	contemporary to the mechanical engineering field.		
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to: design, build, operate, inspect and maintain mechanical equipment and systems.	LO8	Design shafts, fasteners, and structural elements in compliance with national and international standards.

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 machine design, standards and codes	4	2	2	
2	Review of mechanical properties of materials and selection	4	2	2	
3	Stress analysis and Mohr's Circle	4	2	2	
4	Combined stresses and static failure theories	4	2	2	

5	Design of shafts and keys under static loading	4	2	2	
6	Design of springs	4	2	2	
7	Revision and Midterm Exam.				
8	Fatigue failure and endurance limit	4	2	2	
9	Design for fluctuating loads using fatigue criteria	4	2	2	
10	Threaded fasteners and screw design	4	2	2	
11	Power screws and bolted joints	4	2	2	
12	Welded joints – Design and strength analysis	4	2	2	
13	Seal, press and shrink fits – design overview	4	2	2	
14	Design integration and case studies – revision	4	2	2	
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)	5	10	10%
2	Exam 2 written (Semester work or quiz)	10	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments /sheets	Monthly	10	10%
6	Project	13	10	10%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (must be written in full according to the scientific documentation method)	- shigley, J. E., Mischke, C. R., & Brown, T. H. Jr. (2017). <i>Standard handbook of machine design</i> (3rd ed.). McGraw-Hill Education.

references, etc.) *	Other References	• Gupta, R. K. J. (2010). <i>A textbook of machine design</i>. [Publisher not specified]. • Norton, R. L. (2010). <i>Machine design</i> (4th ed.). Prentice Hall. • Smith, W. F. (1996). <i>Principles of materials science and engineering</i> (3rd ed.). McGraw-Hil
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	.Data-show and laptop
	Supplies	N/A
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Said Zoalfakar	Dr. Mohamed Ashraf
Signature	سعيد ذوالفقار	محمد اشرف

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Fluid Power			
Course Code (according to the bylaw):	MEC 212			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mohamed Ashraf			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Introduction to fluid power – Physical properties of hydraulic fluids – Energy & Power in Hydraulic systems – Source of hydraulic Power (Pumps). Hydraulic actuators and motors – Valves and other Control components in hydraulic systems – Hydraulic circuit design and analysis – Introduction to pneumatic systems –Component, circuits and applications – Fluid logic control systems – Electrical control for fluid power circuits.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3,A10, B1, B3)		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 fluid power systems with key relationships manipulation by applying basics of fluid power control.
		LO2	Distinguish between different types of fluid power systems and describe the physical properties of hydraulic fluids.
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 Energy and Power in Hydraulic Systems to calculate the conservation of energy, continuity equation and calculation of losses of flow in pipes.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Analyze applications for hydraulic circuits operations by searching for information to develop knowledge and skills which lead to life-long learning.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Distinguish in analytic way the applications that contain simultaneous hydraulic circuits by applying the basic concepts.
		LO6	Determine the loads of actuators and motors, the losses in the flow pipes and the velocity of extension and retraction of Actuators.
B3	Select conventional mechanical equipment according to the required performance.	LO7	Select the suitable hydraulic pumps, type of fluid, actuators and control valves.

		LO8	Select the design circuit for hydraulic system according to the required performance.

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 fluid power	4	2	2	-
2	Physical Properties of Hydraulic Fluids	4	2	2	-
3	Energy and Power in Hydraulic Systems	4	2	2	-
4	Basic of Hydraulic Flow in Pipeline	4	2	2	-
5	Application of Basic of Hydraulic Flow in Pipeline	4	2	2	-
6	The Source of Hydraulic Power: Pumps	4	2	2	-

7	The Source of Hydraulic Power: Pumps	4	2	2	-
8	Revision and Mid Exam				
9	Hydraulic Actuators and Motors	4	2	2	-
10	Hydraulic Actuators and Motors	4	2	2	-
11	Valves and Other Control Components in Hydraulic Systems	4	2	2	-
12	Valves and Other Control Components in Hydraulic Systems	4	2	2	-
13	Hydraulic Circuit Design and Analysis	4	2	2	-
14	Hydraulic Circuit Design and Analysis	4	2	2	-
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)	9	10	10%
3	Exam 3 written (Semester work or quiz)	11	10	10%
4	Term Paper	12	10	10%
5	Midterm exam	8	20	20 %
6	Final Written Exam	15, 16	40	40 %

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)	- Esposito, A. (2020). <i>Fluid Power with Applications</i> (9th ed.). Pearson. - Abu Hanieh, A. (2021). <i>Fluid Power Control</i> (2nd ed.). Jerusalem.
	Other References	Bansal, R. K. (2018). <i>A Textbook of Fluid Mechanics and Hydraulic Machines</i> . Laxmi Publications.
	Electronic Sources (Links must be added)	Microsoft teams
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	Festo Program
	Other (to be mentioned)	-----

	Course Coordinator	Program Coordinator
Name	Dr. Mohamed Ashraf	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Theory of machines (2)			
Course Code (according to the bylaw):	ENG 212			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mostafa Abd El-Galil Mohamed			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

The course covers the dynamics of machines and linkage (using energy method) Design of flywheel. Balancing of rigid and flexible rotors. Balancing of reciprocating engine. Mechanical vibration (single- degree of freedom system).

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, 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 solution methods for single-degree-of-freedom dynamic systems.
		LO2	Conduct force analysis in mechanisms using the principle of virtual work.
		LO3	Explain the performance characteristics of flywheels.
		LO4	Formulate the linearized equation of motion for single-degree-of-freedom vibration systems.
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.	LO5	Apply virtual work principles to the design of dynamic mechanical systems.
		LO6	Calculate balancing masses and positions for rotating components.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics, and Vibrations.	LO7	Analyze equilibrium and dynamic forces in machine components.
		LO8	Design a flywheel based on energy fluctuation and speed regulation.
		LO9	Model damping systems in vehicles using vibration theory.

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	Dynamic of single degree of freedom system	4	2	2	-
2	Coordinates and constraints, virtual displacement, generalized force, principal of virtual work.	4	2	2	-
3	Methods of solution of dynamical systems (accelerating force method, inertia force method, work and energy method).	4	2	2	-
4	Steady motion of a machine: flywheel analysis	4	2	2	-
5	Continue Steady motion of a machine: flywheel analysis	4	2	2	-
6	Continue Steady motion of a machine: flywheel analysis	4	2	2	-
7	Revision and Mid Exam				
8	Continue Steady motion of a machine: flywheel analysis	4	2	2	-
9	Balancing : introduction, concepts and principles of reciprocating and rotating balancing.	4	2	2	-

10	Balancing of rotting machines: introduction, concepts and principles of rigid rotor balancing – mathematical analysis, balancing of two rotating masses lying (in the same plane)	4	2	2	-
11	Balancing of rotting machines: mathematical analysis, balancing of serval rotating masses lying (in the same plane).	4	2	2	-
12	Balancing of rotting machines: mathematical analysis, balancing of serval rotating masses lying (in serval planes).	4	2	2	-
13	Introduction to mechanical vibration :Linear undamped vibrating system (free response).	4	2	2	-
14	Linear undamped vibrating system (free response).	4	2	2	-
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)	9	10	10%
	Exam 3 written (participations)	11	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
7	Assignments / Project	Monthly	10	10%

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)	Uicker Jr, J.J., Pennock, G.R. and Shigley, J.E., (2023). Theory of machines and mechanisms. Cambridge University Press.
	Other References	Gupta, B. V. R. (2010). Theory of Machines: Kinematics and Dynamics. IK International Pvt Ltd.
	Electronic Sources (Links must be added)	Course notes are available to the students on the copy center of the Institute and Microsoft teams.

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mostafa Abd El-Galil Mohamed	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic Information

Course Title (according to the bylaw):	Environmental Impacts of Projects			
Course Code (according to the bylaw):	MNG 202			
Department/s that participated in the teaching:	Chemical Engineering Dept.			
Total number of credit hours of the course: (according to the bylaw): 1	Theoretical	Practical	Other (Tutorial)	Total
	1	-	-	1
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Ass Prof / Soad Abdel Aziz El Metwaly			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/5/2025			

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) (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 (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 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	-	-	

10	Review and licensing	1	1	-	-	
11	Quiz 2 - Review and licensing (continued)	1	1	-	-	
12	Monitoring and Auditing	1	1	-	-	
13	Monitoring and Auditing (continued)	1	1	-	-	
14	Case Study	1	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)	According to schedule	15	15%
2	Exam 2 written (Semester work)	According to schedule	15	15%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	40	40%
5	Assignments / Reports /case study	According to schedule	10	10%

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)	John Glasson, Riki Therivel and Andrew Chadwick, Introduction to Environmental Impact Assessment, 4th edition, 2012.
	Other References	- Thom B. Fischer, "Strategic Environmental Assessment in Transport and Land Use Planning", 1st edition, 2023, - Barbara Carroll, Josh Fothergill, Jo Murphy, and Trevor Turpin, "Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities", Third edition, 2019 - Peter Morris and Riki Therivel,

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

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

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Introduction to Accounting			
Course Code (according to the bylaw):	HUM 201			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Ahmed Abd El-Gafar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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).

Program Outcomes (NARS) (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.	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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 & documents different types of revenues & expenditure	2	2	0	0
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	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	
2	Exam 2 written (Semester work)	11	10	
3	Midterm exam	7	20	20 %
4	Final Written Exam	14	40	40 %
7	Assignments / Project /Portfolio/ Logbook	10,12	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	Mohamed Sabri El Attar, Mansoura Hamed& Ahmed El-Sabagh, Principles of financial Accounting, Cairo University.2020
	Electronic Sources (Links must be added)	• https://www.oreilly.com/library/view/financial-accounting-in/9780470635292/ch03sec3.html • https://www.coursera.org/learn/financial-accounting • https://open.umn.edu/opentextbooks/textbooks/640/
	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.

	Course Coordinator	Program Coordinator
Name	Prof. Ahmed Abd El-Gafar	Prof. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	English Literature			
Course Code (according to the bylaw):	HUM 202			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mai Abouzaid			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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) (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 English words.	LO1	Enhance students' abilities in reading English Literature
		LO2	Developing reading strategies for different purposes.
		LO3	Study different types and genres of English Literature(poetry, novel, drama and short stories).
		LO4	Work effectively in team of multi-disciplinary or multi-culture.
A9	Communicate effectively, verbally and in writing with a range of audiences.	LO5	Apply the four skills of language freely with particular emphasis on dealing with literary works.
A10	Acquire and apply new knowledge and practice through English language.	LO6	Express themselves in English with confidence, especially while evaluating and criticizing the literary work.
		LO7	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Shakespeare's Poems	2	2	0	0
10	Christopher Marlowe's Poems	2	2	0	0
11	Supplementary Material and Quiz	2	2	0	0
12	Supplementary Material and Quiz	2	2	0	0

13	Presentations	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	14	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)	"English Literature"; HTI; Available Hard copy. Available Presentation (handed to students' part by part).
	Other References	1- History of English Literature by Edward Albert. London: Routledge, 2019. 2- Arabic Literature in Translation. Cairo: The American University in Cairo, 2022. 3- The Complete Works of William Shakespeare. London: Canterbury Classics, 2023. 4- The Norton Anthology of World Literature. London: Norton, 2023.
	Electronic Sources (Links must be added)	https://englishworld.com/
	Learning Platforms (Links must be added)	EKB - Microsoft office
	Supportive facilities & equipment	
	Devices/Instruments	Notebook and data show equipped lecture room.
	Supplies	Teaching aids and computers.

for teaching and learning *	Other (to be mentioned)	Notebook and data show equipped lecture room.

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

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Trade Law			
Course Code (according to the bylaw):	HUM 203			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Ahmed Abd El-Gafar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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).

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A7,A8,A10)		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO1	Assess issues of the latest knowledge about the concepts, characteristics, and types of contracts, contract constituents
		LO2	Explain the main principle of Role of contracts: concept, attributes, and principles
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO3	Elucidate the main principal Dynamic nature of contract administration,
		LO4	Clarify the main principal-of limitations as imposed by law,
		LO5	Design the , the legal variables encountered in business
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO6	Solving problems related to commercial transactions.
		LO7	Evaluating search results, the limitations as imposed by law,
		LO8	Describe the main concepts of the basics of the legal variables encountered in business and commercial transactions.
		LO9	Working in a team group
		LO10	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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Fundamental of definition concepts, characteristics Trade Law - 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	Revision and Mid Exam				

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	Supplementary materials 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	14	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	محمد عبد الكريم يوسف- "الصياغة القانونية للعقود التجارية، 2021
	Electronic Sources (Links must be added)	https://www.edx.org/learn/business-administration
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities &	Devices/Instruments	Notebook and data show equipped lecture room.

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

	Course Coordinator	Program Coordinator
Name	Prof. Ahmed Abd El-Gafar	Prof. Ahmed Abd El-Gafar
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Entrepreneurship			
Course Code (according to the bylaw):	Hum 206			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	--	--	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Moataz Mohamed Abd El-Raouf			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	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) (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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	Practical Lab /
1	*Definition of Entrepreneurship. *What is meant by: Entrepreneur? * Competencies of entrepreneur.	2	2	-	-
2	*Main processes of Entrepreneurship. *The difference between entrepreneurship projects and small enterprises. *Inspiring Entrepreneurs Story of KINGINE Founders.	2	2	-	-
3	*The role of entrepreneurship and small enterprises in the development of the economy of countries. *Classification of different types of pilot projects.	2	2	-	-
4	*Entrepreneurship between science and talent. *Success story of an entrepreneur (jewellery designer Azza Fahmi).	2	2	-	-
5	Stages of Entrepreneurship Process: *Identify and evaluate the opportunity. *Develop business plans. *Resources required. *Manage the enterprise. Success story of an entrepreneur: Nike	2	2	-	-

6	-Entrepreneurial problems. -Why do so many small projects fail? + Online Quiz	2	2	-	-
7	Revision and Mid Exam				
8	-Success stories of Ingvar Kaber: IKEA Founder. -Definition of: Business incubators including its Importance.	2	2	-	-
9	-Basic services provided by business incubators. -Classification of Business incubators. -Proportions of services provided by business incubators.	2	2	-	-
10	-Examples Global and local Business incubators -success stories of El Araby Group. + Online Quiz	2	2	-	-
11	Entrepreneurial Project Presentations	2	2	-	-
12	Entrepreneurial Project Presentations	2	2	-	-
13	Entrepreneurial Project Presentations	2	2	-	-
14	Revision	2	2	-	-
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)	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 *

Learning resources (books, scientific references, etc.) *	The main (essential) reference (must be written in full according to the scientific documentation method)	- Nieuwenhuizen, C. <i>Basics of entrepreneurship</i>. Juta and Company Ltd. (2004). - Kuratko, D. F. <i>Entrepreneurship: Theory, process, and practice</i>. Cengage learning.(2016)
	Other References	Singh, S. K., and Sanjay Gupta. <i>Entrepreneurship: E-book</i> . SBPD Publications, 2016.
	Electronic Sources (Links must be added)	https://guides.erau.edu/entrepreneurship/websites
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr.Moataz Mohamed Abd El-Raouf	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Scientific Thinking			
Course Code (according to the bylaw):	HUM 207			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr./ Mustafa Muhammad Fadel			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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) (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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Revision and Mid Exam				
8	Scientific analysis and linking between variables	2	2	0	0
9	Suggest scientific solutions to practical problems	2	2	0	0
10	levels of thinking and scientific thinking techniques	2	2	0	0
11	Ethical standards of scientific research.	2	2	0	0
12	The impact of innovative thinking on management in organizations and change management	2	2	0	0
13	The impact of innovative thinking on management in organizations and change management	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	Exam 1 written (Semester work)	5	10	10 %
2	Exam 2 written (Semester work)	9	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	14	40	40 %
5	Final Oral Exam	12	10	10 %
6	Assignments / Project /Portfolio/ Logbook	12	10	10 %

6- Learning Resources and Supportive Facilities *

Learning resources	The main (essential) reference	Available Presentation (handed to students' part by part).

(books, scientific references, etc.) *	(must be written in full according to the scientific documentation method)	
	Other References	• Michael E Gorman; “Scientific and Technological Thinking” 2005 by Lawrence Erlbaum Associates • Richard Paul, Linda Elder: The Miniature Guide to Scientific Thinking; 2023
	Electronic Sources (Links must be added)	• https://www.youtube.com/watch?v=pOb_jKqy_s0&ab_channel=Flippin%27ScienceVideos • https://study.com/learn/lesson/scientific-thinking-process-examples.html
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	
	Supplies	
	Electronic Programs	
	Skill Labs/ Simulators	x
	Virtual Labs	x
	Other (to be mentioned)	x

	Course Coordinator	Program Coordinator
Name	Dr./ Mustafa Muhammad Fadel	PROF. Ahmed Abdel Ghafar
Signature	<i>Mustafa Muhammad Fadel</i>	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Business Administration			
Course Code (according to the bylaw):	HUM 208			
Department/s that participated in the teaching:	Basic Sciences			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	0	-	2
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Prof. Ahmed Abd El-Gafar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	7/26/2025			

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).

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

		LO9	Maintain the high ethical standards of business work.
		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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (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	Control function.	2	2	0	0
10	Management levels and skills required for each level.	2	2	0	0
11	Administrative communication process.	2	2	0	0
12	Supplementary materials and Quiz	2	2	0	0
13	Presentations	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	14	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-Mohamed Abdallah Abd El Rehim, Fundamental of Management & Organization, Cairo University.2022 2-El Desouky Hamed Abou Zeid, the Scientific Fundamentals of Management, Cairo University.2022
	Electronic Sources (Links must be added)	https://www.ecpi.edu/blog/what-is-business-administration-all-about https://www.edx.org/learn/business-administration

	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.

	Course Coordinator	Program Coordinator
Name	Prof. Eid Abd El-Baset Eid	Prof. Ahmed Abd El-Gafar
Signature	Eid Abd El-Baset Eid	

المستوى الثالث (SENIOR 1)

فصل دراسي ثانى - نموذج هيئة جديد

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Heat and Mass transfer			
Course Code (according to the bylaw):	MEC 223			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Shabban			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Fundamentals of heat transfer by conduction; steady and unsteady, convection forced and natural, radiation, mass transfer; fundamental and operations. Analysis of industrial heat and mass transfer operations. Equipment design. Temperature and heat flux measurements, boiling and evaporation, conduction, convection, heat exchanger.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1 & A3 & A10&B1 & B3)		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 heat and mass transfer rate calculations with key relationships manipulation by applying basics of heat and mass transfer.
		LO2	Distinguish the different shapes for conduction heat transfer in one dimension (steady and unsteady) and two dimensions.
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 suitable correlations to calculate the rate of convection heat transfer (forced & free) and radiation heat transfer.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Analyze applications for heat and mass transfer operations by searching for information to develop knowledge and skills which leading to life-long learning.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Distinguish in analytic way the applications that contain simultaneous heat and mass transfer by applying the basic concepts.
		LO6	Determine the rate of boiling and condensation heat transfer.

B3	Select conventional mechanical equipment according to the required performance.	LO7	Select the suitable type of heat exchangers.
		LO8	Select the design method for conventional heat exchangers according to the required performance.

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 heat and mass transfer.	4	2	2	
2	-One-dimension steady conduction heat transfer without heat generation. -One-dimension steady conduction heat transfer with heat generation.	4	2	2	
3	-Extended surfaces (Fins). -One-dimension un-steady conduction heat transfer. -Two-dimension steady conduction heat transfer.	4	2	2	
4	External forced convection (Laminar and turbulent flow over flat plate).	4	2	2	

5	External forced convection (Flow across single tube)	4	2	2	
6	Internal forced convection (Laminar and turbulent flow inside tube).	4	2	2	
7	Revision and Mid Exam				
8	External forced convection (flow across tube bank).	4	2	2	
9	Basic concepts of natural convection and radiation heat transfer.	4	2	2	
10	Heat exchangers (Basic concepts, its types, and heat balance equations).	4	2	2	
11	Design of Heat exchangers by two different methods (LMTD method and ϵ -NTU method).	4	2	2	
12	concepts of diffusion and convection mass transfer. -Simultaneous heat and mass transfer applications.	4	2	2	
13	-Different correlations for Boiling and Condensation heat transfer. -Different correlations for Boiling and Condensation heat transfer.	4	2	2	
14	-Revision for part 2.	4	2	2	
15,16	Final Exam.				

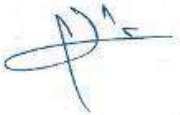
5- Methods of students' assessment:

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

5	Final Practical/Clinical/... Exam	-	-	-
6	Final Oral Exam	-	-	-
7	Assignments / Project /Portfolio/ Logbook	2,4,6,9	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)	-Lecture notes available to the students on copy center of the Institute. -Yunus A. Cengle and Afshin J. Ghajar "Heat and mass transfer: Fundamentals & Applications.", 6 th edition , McGraw Hill Education,2020. -J.P. Holman "Heat transfer", Tenth edition, McGraw Hill Education, 2010.
	Other References	Rajm.Manglik,Mark.S.Bohn, —Principles of Heat TransferI, Library of Congress,7th ed,(2011)
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Shabban	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Production Technology 2			
Course Code (according to the bylaw):	ENG 221			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Abdou Abdallah Hassan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

By the end of this course the student must be taught:

Casting, sand casting (pattern and core making design, foundry sand, gating system design) gravity die casting, pressure die casting, centrifugal casting, lost-wax casting, continuous casting, new casting technique, casting finishing, inspection, testing and defects. Metal forming, theory of plasticity, flow curve, blanking and piercing, rolling,

forging, extrusion, deep drawing, powder metallurgy. Casting workshop, prepare a mold for pouring and gating system design, metal fluidity, testing of sand casting, calculation of furnace charge. Metal forming workshop, flow curve determination (tension test and compression test), design of punch and die for blanking and piercing.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A10, B1 & 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	Identify the main types and steps of sand casting and metal forming processes.
		LO2	Compare various manufacturing techniques in casting and forming through lab observations and design activities.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO3	Analyze the application of forming forces in wire drawing using experimental data.
		LO4	Evaluate the force requirements in metal forming operations using plasticity theory and flow curves.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Investigate common casting defects and correlate them to casting parameters using analytical methods.
		LO6	Calculate dimensions of the gating system for different casting operations based on fluidity and pouring rate.
		LO7	Select the appropriate gating and feeding system for a specific casting application.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using	LO8	Choose the suitable type of melting furnace based on the casting alloy and required production rate.

	appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to metal forming – Theory of plasticity – Flow curve determination	4	2		2
2	Sheet metal forming (blanking, piercing) – Punch and die design	4	2		2
3	Deep drawing and extrusion – Defects in formed parts	4	2		2
4	Bulk forming operations – Wire drawing – Application of forming forces	4	2		2
5	Rolling and forging – Flow stress analysis	4	2		2
6	Powder metallurgy – Comparison with traditional forming	4	2		2

7	Revision and Mid Exam				
8	Introduction to casting – Sand casting (pattern, core making, mold types)	4	2	-	2
9	Gating system design – Foundry sand testing – Fluidity	4	2	-	2
10	Permanent mold casting – Gravity, pressure, and centrifugal casting	4	2	-	2
11	Lost-wax casting – Continuous casting – Furnace charge calculation	4	2	-	2
12	Melting furnaces – Furnace selection criteria	4	2	-	2
13	Casting defects – Defect analysis and inspection methods	4	2	-	2
14	Review of forming and casting – Case studies and applications	4	2		2
15,16	Final Exam.				

Experiment Topics: (If any)

Serial	Experiment
1	Flow curve determination (tension test)
2	Flow curve determination (compression test)
3	Design of punch and die for blanking and piercing
4	Bulk forming, wire drawing
5	Rolling
6	Defects of metal forming products
7	Casting workshop, prepare a mold for pouring
8	Testing of sand casting, (Tension, compression and shear test of sand)
9	Metal fluidity test (spiral 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 or quiz)	4	10	10 %
2	Exam 2 written (Semester work or quiz)	9	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Final Practical Project Exam	13	10	10 %
6	Assignments	6 & 10	10	10 %

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)	Groover, M. P. "Fundamentals of modern manufacturing: materials, processes, and systems". John Wiley & Sons, 7th edition (2019)
	Other References	- Campbell, JS "Principles of Manufacturing Materials and Processes", McGraw Hill, New York, (2018). P. N. Rao, "Manufacturing Technology", McGraw-Hill, (2005)
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	N/A
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	Metal forming and Casting Lab.

	Course Coordinator	Program Coordinator
Name	Dr Abdou Abdallah	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Mechanical Vibration			
Course Code (according to the bylaw):	ENG 222			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mahmoud Essam Elsaify			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Free and damped vibrations, harmonically excited motion, rotating and reciprocating unbalance, free and forced vibration of a single degree of freedom system. Vibration of multi degree of freedom system, vibration of continuous system (beams). Approximate methods. – Vibration measurements.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, B1, B3)		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 values of spring constants, masses, and damping constants of a vibration system using various methods.
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.	LO2	Formulate the equation of motion of the vibration systems (free or forced) using various techniques.
		LO3	Apply suitable correlations to calculate the parameters of vibratory system parts for the vibration systems (forced & free).
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO4	Analyze applications for vibration systems by searching for information to develop knowledge and skills which lead to life-long learning.
		LO5	Distinguish in an analytic way the applications that contain vibration motion by applying the basic concepts.
		LO6	Model different vibration systems (translation and rotation) and estimate their equation of motion.
B3	Select conventional mechanical equipment according to the required performance.	LO7	Analyze the vibration systems behavior.
		LO8	Select the accelerometer to measure the amplitude, velocity and acceleration of the vibrating body according to the required performance.

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	Fundamentals of vibration systems: - Fundamental concepts - Vibration system elements - Mathematical modeling - Harmonic analysis	4	2	2	--
2	Single DOF free vibrating system: - Equation of motion derivation – undamped system - Equation of motion derivation – damped system - Torsional system Logarithmic decrement method	4	2	2	--
3	Single DOF free vibrating system: Equation of motion derivation – undamped system	4	2	2	--

	- Equation of motion derivation – damped system - Torsional system - Logarithmic decrement method				
4	Harmonically excited vibrating system: - Damped and un-damped systems - Beating phenomena - Base-excitation Unbalance as the main cause of vibration	4	2	2	--
5	Harmonically excited vibrating system: - Damped and un-damped systems - Beating phenomena - Base-excitation Unbalance as the main cause of vibration	4	2	2	--
6	Vibration under general forcing conditions: - Periodic force - Convolution integral Laplace transform	4	2	2	--
7	Revision and Mid Exam				
8	Vibration under general forcing conditions : - Periodic force - Convolution integral - Laplace transform	4	2	2	--
9	Two Degree of Freedom System: - Equation of motion - Damped and undamped systems - Free and forced systems Torsional system	4	2	2	--
10	Two Degree of Freedom System: - Equation of motion - Damped and undamped systems - Free and forced systems Torsional system	4	2	2	--
11	Multi-degree of freedom systems: 3-degree of freedom - Molding continues system as multi DoF system - Natural frequencies and mode shapes Dunkerley's Formula	4	2	2	--
12	Rotating and reciprocating unbalance	4	2	2	--

13	Vibration of continuous systems (beams)	4	2	2	--
14	Vibration measurements - Balancing of rotating machinery - Whirling of shafts - Vibration isolation and absorbers Introduction to vibration measurements in field	4	2	2	--
15,16	Final Exam.				

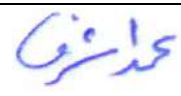
5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work or quiz)	5	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 %
5	Assignments	Monthly	10	10%

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)	Singiresu, S. Rao. "Mechanical Vibrations.", 8th edition, Pearson, 2020
	Other References	- Mechanical Vibration: Theory and Application, S. Graham Kelly, Cengage Learning, 2011 - Introductory Course on Theory and Practice of Mechanical Vibration, J. S, Rao, J.K. Gupta, New Age International, 1999. - Vibration Fundamentals and Practice, C. W. Silva, CRC Press 1999
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for	Devices/Instruments	N/A
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A

teaching and learning *	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mahmoud Essam Elsaify	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Engineering Materials			
Course Code (according to the bylaw):	ENG 224			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mahmoud Essam Elsaify			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Ferrous alloys, plain carbon steels, conventional heat treatments, alloy steels, stainless steel, cast irons. Nonferrous alloys, aluminum, copper, nickel, magnesium and titanium alloys. Ceramic materials, structure and properties, processing of ceramics, applications.

Polymers, structure and properties; polymer processing technology, elastomers. Composite materials, particulate reinforced, fiber reinforced and laminar composites.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
A1, A2, A3, B1, B2, B4		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 properties and applications of different types of steel, cast iron, nonferrous alloys, ceramics, polymers and composites.
		LO2	Interpret binary phase diagrams.
		LO3	Describe Iron-carbon phase diagram and structural constituents of ferrous alloys.
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	Apply material engineering concepts to enhance the mechanical and physical properties of engineering materials.
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.	LO5	Evaluate the structural changes during heat treatment process.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the	LO6	Analyze the effect of different alloying elements on the structure and properties of steel.

	concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO7	Analyze relevant information from phase diagrams and the type of failure from different fractures surfaces.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO8	Plan for new materials according to the required applications need.
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to design, build, operate, inspect and maintain mechanical equipment and systems.	LO9	Select the appropriate material for a specific application.

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 Engineering Materials.	4	2	2	--
2	Fe-C phase diagram (part 1)	4	2	2	--
3	Fe-C phase diagram (part 2)	4	2	2	--
4	Ferrous alloys, plain carbon steels	4	2	2	--
5	Ferrous alloys, plain carbon steels	4	2	2	--
6	Conventional heat treatments of plain C-steels, isothermal transformation diagrams, continuous cooling transformation diagrams.	4	2	2	--
7	Revision and Mid Exam				
8	Simple heat treatments.	4	2	2	--
9	Effect of alloying elements, hardenability, Alloy steels, stainless steels, cast irons.	4	2	2	--
10	Cast irons. & Stainless steels.	4	2	2	--
11	Nonferrous alloys, aluminum, copper alloys Nickel, magnesium and titanium alloys	4	2	2	--
12	Ceramic materials & Polymers	4	2	2	--
13	Composite materials	4	2	2	--
14	Revision and overview of the course	4	2	2	--
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)	5	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 %
5	Assignments	14	10	10%

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)	-D. Askeland, " The Science and Engineering of Materials " Brooks/Cole , Eng. Division ,2019.
	Other References	-William F. Smith, Fundamentals of materials science and engineering "; McGraw-Hill, Third Edition, 2004. -Askeland , — The Science and Engineering of Materials — Brooks/Cole , Eng. Division ,1984
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	N/A
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mahmoud Essam Elsaify	Dr. Mohamed Ashraf
Signature		

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:
نظري	عملي	أخرى (تحديد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
٢			٢	
اجباري				نوع المقرر:
SENIOR 1				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
د/ سلوي 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 (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A3,A4,A5,A7,A8)	
الكود	النص	الكود	النص
A3	LO1 يفهم أهمية التفاوض	A3	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 وسياسات التصميم والتنمية المستدامين.
	LO2 يتعرف علي مبادئ واسس التفاوض		
	LO3 اكتساب مهارات الحوار والنقاش البناء		
A4	LO4 اكتساب مهارات المعرفة من خلال الانترنت	A4	الاستفادة من التقنيات المعاصرة وقواعد الممارسة والمعايير وإرشادات الجودة ومتطلبات الصحة والسلامة والقضايا البيئية ومبادئ إدارة المخاطر.
	LO5 اكتساب مهارات التواصل الجيد مع الآخرين		
	LO6 اكتساب مهارات العمل مع فريق		
	LO7 التعاون والتعامل مع الآخرين		
A5	LO8 اكتساب مهارات التواصل الجيد مع الآخرين	A5	ممارسة تقنيات البحث وطرق التحقيق كجزء متاصل من التعلم.
A7	LO9 القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية	A7	العمل بكفاءة كفرد وعضو في فرق متعددة التخصصات ومتعددة الثقافات.
A8	LO10 القدرة علي قيادة المهنيين والعمل كفريق لانجاز المهام العملية	A8	التواصل الفعال -بباني ولفظيا وخطيا - مع مجموعة من الجماهير باستخدام الأدوات المعاصرة.

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	المعمل الافتراضية	التعلم الإلكتروني	النكاه الإصطناعي في التعليم
√			√		√	√	√			√	√			√	√

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس 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 (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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	تكليفات / مشروع / ملف الإنجاز / كتيب الأنشطة	طوال الفصل	20	20 %

6- مصادر التعلم والتسهيلات المادية:

1- د. مجدي عبد الله شرارة .. دليل المفاوض المثالي، مؤسسة فريدريش أبيرت، مكتب مصر، القاهرة، الطبعة الأولى 2016 2- عروض تقديمية (يوربوينت) عن المقرر، يعطى للطلاب جزءاً بجزء.	المرجع الأساسي للمقرر (لا بد من كتابة البيانات كاملة وفقاً لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
1 - باترسون، جيمس ج. كيف تصبح مفاوضاً ناجحاً؟ الرياض: مكتبة جرير، 1999 2 - محسن الخضير: تنمية المهارات التفاوضية، القاهرة، الدار المصرية اللبنانية، 1993	المراجع الأخرى	
• https://ar.wikipedia.org/wiki • http://www.du.edu.eg/ • https://www.youtube.com/watch?v=bnCua19M_EA	المصادر الإلكترونية (لا بد من إضافة الروابط)	
EKB - Microsoft office General HUM 204 مبادئ التفاوض Microsoft Teams	المنصة التعليمية (لا بد من إضافة الرابط)	
الوسائل التعليمية (داتا شو) وجهاز كمبيوتر محمول	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
باور بوينت يحتوي المادة العلمية تقدم بشكل دوري للطلاب	المستلزمات	
Microsoft Teams	البرامج الإلكترونية	
-	معامل المهارات/ المحاكيات	
-	المعامل الافتراضية	
-	أخرى (تذكر)	

منسق البرنامج	منسق المقرر	
أ.د/ أحمد عبد الغفار	د/ سلوي محمد عبد المحسن	الإسم
		التوقيع

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: (تبعاً لما ورد باللائحة)
1		1	2	
اجباري				نوع المقرر:
SENIOR 1				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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 مزاوله 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 (التي يحققها المقرر تبعاً للمصنوفة 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 الاسس 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 الاعمال 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 لوجيا المعلومات				التدريس الغير مباشر								التدريس 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 الأسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
			تدريس نظري	تدريب
1	المقدمة ومفهوم عن علم الهندسة الرياضية /هدفها /اهميتها + 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 والمصطلحات الخاصة بالحركة) + التدريب على اختبارات اللياقة	2	1	0
7	مراجعة وامتحان منتصف الفصل الدراسي			
8	الجهاز الحركي(تركيب العضلة/انواع العضلات)+ تدريبات على اللياقة البدنية	2	1	0
9	الاعتبارات الخاصة باختيار الموقع (المنشأة الرياضية) + تدريبات على اختبارات اللياقة البدنية	2	1	0
10	الاشتراطات العامة لتصميم المنشآت الرياضية + تدريبات على اختبارات اللياقة البدنية	2	1	0
11	التقنيات الحديثة في معالجة المياه + تدريبات على اللياقة البدنية	2	1	0
12	علم النفس الرياضي (الاجهزة الحديثة للتدريب العقلي) + تدريبات على اللياقة البدنية	2	1	0
13	إختبارات الفصل الدراسي النهائية عملي			

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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 حسن دار المعرفة 2020م	المرجع الأساسي للمقرر (لابد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
تطبيقات البيوميكانيك في التدريب والاداء صريح عبد الكريم دار دجلة الطبعة الاولى 2019م	المراجع الأخرى	
• https://ar.wikipedia.org/wiki • https://ar.wikipedia.org/wiki	المصادر الالكترونية (لابد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لابد من إضافة الرابط)	
قاعة محاضرات مجهزة .	1	التجهيزات التعليمية المساندة للتعليم والتعلم *
المكتبات المركزية والفرعية.	2	
الوسائل التعليمية (داتا شو) وجهاز كمبيوتر محمول.	3	
مذكرة لتدريس المقرر وكشوف متابعة للطلاب	4	

منسق البرنامج	منسق المقرر	
ا.د/ أحمد عبد الغفار	د.خلود فاروق حامد	الإسم
	خلود فاروق حامد	التوقيع

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:
نظري	عملي	اخرى (تحدد)	إجمالي	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1			1	
اجباري				نوع المقرر:
SENIOR 1				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				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) :

يتناول المقرر الآتي: الألام 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 المصري من حقوق الإنسان ، والحماية القانونية لها على الصعيد الوطني والصعيد الدولي ، بالإضافة الى حقوق الإنسان في الشريعة الإسلامية – الاصول التاريخية الفلسفية لحقوق الإنسان – المصادر الدولية لحقوق الإنسان (العالمية والاقليمية) – المصادر الوطنية لحقوق الإنسان – الاجهزة العالمية القائمة على حماية حقوق لانسانا (أجهزة الامم المتحدة) – الحماية الوطنية لحقوق الإنسان – حقوق الإنسان في الشريعة الإسلامية – عرض لبعض طوائف الإنسان – مراجعة عامة .

3- نواتج التعلم للمقرر:

تساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		(A3- A8- A10)	
النص	الكود	النص	الكود
معرفة الحقوق الأساسية للإنسان والتي لا يحيا بدونها.	LO 1	تطبيق عمليات التصميم الهندسي لإنتاج حلول فعالة من حيث التكلفة تلبي الإحتياجات 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
معرفة ماله من حقوق وما عليه من واجبات.	LO 2		
معرفة دوره في بناء مجتمعه.	LO 3		
المقارنة بين المراحل المختلفة لتطور حقوق الإنسان في الديانات السماوية والنظم الوضعية.	LO 4	التواصل بفعالية بآليات شفافة وكتابة، مع مجموعات من الجماهير باستخدام الأدوات العصرية.	A 8
معرفة حقوق المواطنة وحقوق الوطن على المواطن.	LO 5		
معرفة حقوق البيئة وضرورة الحفاظ عليها وعلاقتها بحقوق الإنسان.	LO 6		
معرفة أنواع الفساد ودوره في إهدار حقوق الإنسان.	LO 7	اكتساب المعارف الجديدة وتطبيقها، وممارسة استراتيجيات التعلم الذاتي وغيرها مدى الحياة.	A 10
معرفة دور الشباب في مقاومة الفساد وطرق مقاومته.	LO 8		
الممارسة الصحيحة لما له من حقوق وما عليه من واجبات.	LO 9		
تعزيز العديد من السلوكيات والمهارات داخل وخارج نطاق العمل في ضوء معرفته لمنظومة الحقوق والواجبات.	LO10		

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 الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)	إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة		
			تدريس نظري	تدريب	
					تمارين
1	تقديم عن المقرر وتعريف أهميته في حياة الطالب.	1	1	0	0
2	حقوق نفسك عليك، ما هي؟ وكيف تؤديها؟	1	1	0	0
3	- تعريف حقوق الإنسان وخصائصها. - أنواع حقوق الإنسان.	1	1	0	0
4	التطور التاريخي لحقوق الإنسان وحريته.	1	1	0	0
5	- حقوق الإنسان في الشرائع السماوية. - إهدار حقوق الإنسان في الولايات المتحدة الأميركية.	1	1	0	0
6	حقوق الأبناء على الآباء.	1	1	0	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	- حقوق الأزواج والزوجات وتأسيس أسرة صالحة. - حقوق الآباء على الأبناء.	1	1	0	0
9	حقوق الوطن.	1	1	0	0
10	- الانتماء للوطن. - حقوق البيئة.	1	1	0	0
11	- حقوق اللغة العربية. - الفساد وإهدار حقوق الإنسان. (1)	1	1	0	0
12	- الفساد وإهدار حقوق الإنسان. (2) - دور الشباب في مكافحة الفساد. (1)	1	1	0	0
13	دور الشباب في مكافحة الفساد. (2)	1	1	0	0
14	مراجعة عامة.	1	1	0	0
16-15	اختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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	15	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	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
وليد رضوان، حقوق الإنسان، مذكرة للمعهد التكنولوجي العالي بالعاشر من رمضان.	1- خديجة النبراوي: موسوعة حقوق الإنسان في الإسلام، دار السلام للطباعة والنشر والتوزيع، القاهرة. 2015 2- محمد الغزالي: حقوق الإنسان بين تعاليم الإسلام وإعلان الأمم المتحدة، القاهرة، دار الكتب الإسلامية، 1984 3- محمد عمارة: الإسلام وحقوق الإنسان، الكويت، سلسلة عالم المعرفة، عدد مايو 1985 4- محي شوقي أحمد: الجوانب الدستورية لحقوق الإنسان (رسالة دكتوراة، جامعة عين شمس، 1986)
المراجع الأخرى	
المصادر الإلكترونية (لا بد من إضافة الروابط)	1- https://ar.wikipedia.org/wiki 2- http://www.du.edu.eg/ 3- https://www.youtube.com/
المنصة التعليمية (لا بد من إضافة الرابط)	https://www.ekb.eg/ar/home
الأجهزة	(داتا شو) وجهاز كمبيوتر محمول.
المستلزمات	قاعة محاضرات مجهزة
البرامج الإلكترونية	-----
معامل المهارات/ المحاكيات	-----
المعامل الافتراضية	-----
أخرى (تذكر)	-----
التجهيزات التعليمية المساعدة للتعليم والتعلم *	

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

المستوى الثالث (SENIOR 1)

فصل دراسي ثالث (تدريب)-نموذج هيئة جديد

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (3)			
Course Code (according to the bylaw):	FTR 231			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	18	-	18
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 1			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. prof. Amr Hassaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

This is specialized training in which the students' studies, the integrated systems of the various production units, as well as the considerations of industrial safety within the factory. The duration of the industrial training is eighteen hours per week spread over a minimum of five days for one academic term.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A4, A5, A8, A10, B2)		Upon completion of the course, the student will be able to:	
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	Apply safety rules, quality standards, and environmental considerations during industrial training.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO2	Investigate industrial problems using appropriate research and data collection methods.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tool.	LO3	Demonstrate effective communication skills (written, verbal, and graphical) with supervisors and colleagues.
		LO4	Identify the needs and required materials for assigned industrial tasks.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	LO5	Utilize computer-aided design (CAD) systems to support assigned tasks.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO6	Manage the design and implementation of mechanical systems using appropriate tools and materials.

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:

Scientific topics depend on the defined training field/site

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	Train on the overall mechanical and flowchart of processes	18			18
2	Train on the overall mechanical and flowchart of processes	18			18
3	Carry out research using granted internet sites for references related to students' training process	18			18
4	Mid Exam				
5	Train on how to write scientific report	18			18
6	Write technical report	18			18
7	Review and practice the gained skills	18			18
8	Final Evaluation.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	On site evaluation	3	20	20 %
2	Midterm exam	4	20	20 %
3	Final Oral Exam	8	30	40 %
4	Attendance	7	10	10 %
5	Training report discussion	7	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)	Provided by the training site
	Other References	Training handouts
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show Internet connection
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Dr. Amr Hassaan	DR. MOHAMED ASHRAF
Signature		

المستوى الرابع (SENIOR 2)

المستوى الرابع (SENIOR 2)

فصل دراسي اول-نموذج هيئة جديد

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Automatic Control			
Course Code (according to the bylaw):	MEC 244			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Hassan Gassour			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

First and second order systems' modeling; Open and closed loop systems; Transfer function analysis; Frequency response; Time domain representation for 1st and 2nd order systems; MATLAB for system control representations; Introduction to stability; Controllers design.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A2, A10, B1, B3)		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	Solve differential equations using Laplace Transform techniques for engineering system modeling.
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.	LO2	Analyze system responses using time-domain and frequency-domain characteristics to evaluate performance.
		LO3	Select controllers based on steady-state error analysis to meet performance criteria.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO4	Simulate engineering systems using Block Diagrams and Signal Flow Graphs.
		LO5	Evaluate system behavior using standard engineering criteria for dynamic response.
		LO6	Propose improvements to system performance by adjusting controller parameters.
B1	Model, analyze and Design material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis.	LO7	Design controllers using control theory to minimize steady-state errors and achieve desired performance.
B3	Select conventional mechanical equipment according to the required performance.	LO8	Assess system responses to determine the suitability of mechanical components and controllers for given specifications.

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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to control systems & L. T. analysis	4	2	2	-
2	Inverse Laplace & DE solving	4	2	2	-
3	Mechanical & Electrical systems modeling	4	2	2	-
4	Block diagram representation	4	2	2	-
5	Signal Flow Graph	4	2	2	-
6	Stability criteria	4	2	2	-
7	Revision and Mid Exam				
8	1ST & 2ND Order systems' response	4	2	2	-
9	System Response Characteristics	4	2	2	-

10	Steady State Error	4	2	2	-
11	Controllers Design & Tuning	4	2	2	-
12	Controllers Optimization	4	2	2	-
13	Case study	4	2	2	-
14	Mini Project - Practice problems	4	2	2	-
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)	2	6	6 %
2	Exam 2 : written (Semester work)	4	6	6 %
3	Exam 3 : written (Semester work)	9	6	6 %
4	Exam 4 : written (Semester work)	11	6	6 %
5	Exam 5 : written (Semester work)	13	6	6 %
6	Midterm exam	7	20	20 %
7	Final Written Exam	15,16	40	40 %
8	Assignments / Project /Portfolio/ Logbook	14	10	10 %

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)	Control Systems Engineering – 8th Edition, Norman S. Nise, 2020.
	Other References	- Lectures' presentations - Lectures' handouts
	Electronic Sources (Links must be added)	General MEC 244 تحكم الى Microsoft Teams
	Learning Platforms (Links must be added)	EKB - Microsoft office
	Devices/Instruments	Data show

Supportive facilities & equipment for teaching and learning *		Internet connection
	Supplies	N/A
	Electronic Programs	MAT-LAB
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	DR. HASSAN GASSOUR	DR. MOHAMED ASHRAF
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Internal Combustion Engines			
Course Code (according to the bylaw):	MEC 241			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Hussein ElFeky			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Air standard cycles – Actual cycles and their analysis – Main engine parts –Fuel supply to SIE's – Fuel injection systems to CIE's- Ignition systems – Four stroke SI Engines – Two stroke engines and scavenging methods – IC cooling systems – Engine friction and lubrication _ External Characteristics of SIE & CIE(Torque-Power – Fuel consumption Vs rpm).

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B1, and B3)		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 and basic science.	LO1	Identify ICEs and their various components and instrumentation.
		LO2	Define the main aspects of ICE parameters and basic ICE terminologies.
		LO3	Express ICE performance through the power-torque curve.
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	Apply performance evaluation methods by calculating engine torque and power at different operating speeds, to assess the design efficiency of ICE systems
		LO 5	Evaluate the role of internal combustion engine (ICE) analysis and design in addressing energy challenges and promoting sustainable development.
B1	Model, analyze, and design physical systems applicable to the specific discipline by applying the concepts of Thermodynamics, Heat Transfer, Fluid Mechanics, Solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory, and Systems, Mechanical Design, and Analysis, Dynamics, and Vibrations.	LO 6	Analyze the performance of ICEs by applying the main thermodynamic laws for both ideal (air-standard) and actual cycles
		LO 7	Model the actual cycle of ICEs employing the main processes of the ideal (Air-standard) cycles.

B3	Plan, manage, and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO 8	Manage the effect of design parameters related to the main instrumentation associated with ICEs, and evaluate the influence of different operating factors on their overall performance using contemporary engineering tools

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 Engines +Heat Engines	4	2	2	-
2	Basic Heat Engine Components +Standard Terminology	4	2	2	-
3	Analyzing the ideal (Air-standard) cycle of a SIEs	4	2	2	-
4	Analyzing the actual cycle of an SIEs +Analyzing the ideal (Air-standard) cycle of a CIEs	4	2	2	-

5	Analyzing the actual cycle of CIEs + Natural Gas Engines	4	2	2	-
6	Two-stroke engines +Quiz 1	4	2	2	-
7	Revision and Mid Exam				
8	Comparison between two-stroke and four-stroke engines	4	2	2	-
9	Detonation and Pre-ignition	4	2	2	-
10	Heat Rejection and Cooling +Water Cooled Radiator	4	2	2	-
11	Heat Balance Sheet +Intake and Exhaust Systems	4	2	2	-
12	Modern Trends in ICE +Measurements and Testing	4	2	2	-
13	Willian's line method, and Morse test+Quiz 2	4	2	2	-
14	Engine Dynamometer (Dyno) +Torque and power curve	-	-	-	-
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) Semester work (Quiz1)	6	10	10 %
2	Exam (2) Semester work (Quiz2)	13	10	10 %
3	Midterm exam	8	20	20 %
4	Sheets	12	10	10 %
5	Reports	14	10	10 %
6	Final written exam	15,16	40	40 %

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)	V. M. Domkundwar, A course in internal combustion engines. New Delhi, India: Dhanpat Rai & Co., 2018.
	Other References	A. T. Kirkpatrick, Internal combustion engines: Applied thermo sciences. Hoboken, NJ: John Wiley & Sons, 2021

		G. Ferrari, A. Onorati, and G. D'Errico, Internal combustion engines. Bologna, Italy: Società Editrice Esculapio, 2022.
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show and laptop.
	Supplies	White board
	Electronic Programs	-----
	Skill Labs/ Simulators	-----
	Virtual Labs	-----
	Other (to be mentioned)	-----

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Hussein ElFeky	Dr. Mohamed Ashraf
Signature	Ahmed Hussein Elfeky	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Thermo-Fluid Lab (2)			
Course Code (according to the bylaw):	MEC 242			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	2	-	2
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Gamal Nada			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Safety Instructions - Function and performance of measuring instruments and calibration
 -Temperature and heat flux measurements, conduction, convection, and radiation –
 Experiments for different types of heat exchangers - Refrigeration cycle performance.
 Performance of different types of pumps (Plunger, gear and centrifugal pumps) –

Experiments for different types of turbines – Performance of compressors - Performance of steam generator - Performance of internal combustion engine.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A4,A7, A10, 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	Conduct experiments to determine thermal conductivity, heat transfer coefficient, and performance of heat transfer equipment.
		LO2	Analyze the performance of pumps and turbines through laboratory experiments.
		LO3	Calculate the coefficient of performance (COP) of refrigeration cycles and the efficiency of internal combustion engines.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	LO4	Apply health, safety, and environmental rules during laboratory experiments.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	LO5	Perform laboratory tasks effectively as an individual and as part of a team.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	LO6	Integrate theoretical and new engineering knowledge to improve experimental procedures.
B3	Select conventional mechanical equipment according to the required performance.	LO7	Select appropriate mechanical equipment (e.g., heat exchangers, pumps, turbines) based on performance criteria.

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 the laboratory: Health and safety instructions	2	-	-	2
2	- Experiment of Radial heat conduction	2	-	-	2
3	- Experiment of axial heat conduction	2	-	-	2
4	- Experiment of Extended surface area (Fins)	2	-	-	2
5	- Experiment of tubular Heat Exchanger	2	-	-	2
6	- Review	2	-	-	2
7	Mid Exam				
8	- Experiment of shell and tube Heat Exchanger	2	-	-	2
9	- Experiment of hydraulic water turbine	2	-	-	2

10	- Experiment of the axial turbine	2	-	-	2
11	- Experiment of the plunger Pump	2	-	-	2
12	- Experiment of the gear Pump	2	-	-	2
13	- Experiment of refrigeration unit	2	-	-	2
14	- Review	2	-	-	2
15,16	Final Exam				

Experiment Topics: (If any)

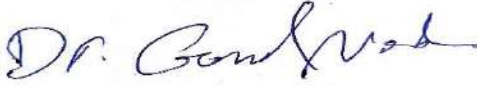
Serial	Experiment
1	-Experiment of Radial heat conduction
2	- Experiment of axial heat conduction
3	- Experiment of Extended surface area (Fins)
4	- Experiment of tubular Heat Exchanger
5	- Experiment of shell and tube Heat Exchanger
6	- Experiment of hydraulic water turbine
7	- Experiment of the axial turbine
8	- Experiment of the plunger Pump
9	- Experiment of the gear Pump
10	- Experiment of refrigeration unit

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Midterm exam	7	30	30 %
2	Exam 1 written (Semester work or quiz)	11	10	10 %
3	Final Written and Oral Exam	15, 16	30	30 %
4	Reports	through semester	30	30 %

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)	Dr. R. K. Bansal , “ <i>Textbook of Fluid Mechanics and Hydraulic Machines</i> “, Published by Laxmi Publications, ninth Edition, 2017 Afshin J. Ghajar and Yunus A. Çengel, “ <i>Heat and Mass Transfer Fundamental and Applications</i> “, 6th Edition, Mcgraw-Hill, New York, 2020.
	Other References	Yunus A. Cengel and Michael A. Boles “ <i>THERMODYNAMICS: An Engineering Approach</i> ” McGraw-Hill, New York., Eight Edition, 2015 Course Notes: Available as soft copy on Microsoft teams
	Devices/Instruments	Data show and laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Other (to be mentioned)	Library

	Course Coordinator	Program Coordinator
Name	اسم منسق المقرر	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Machine Design			
Course Code (according to the bylaw):	ENG 244			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Asso. prof. Marwa Elmahdy			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Static and fatigue strength - power transmitted elements - dynamics shaft design - clutches brakes – gears (spur, helical, bevel and worm gearing) - belts and chains - bearings hydrodynamics, hydrostatic and anti-friction bearings.

3.Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1,A3,A10,B1,B3)		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 different machine elements design and calculations by applying basics of machine design.
		LO2	Distinguish the different shapes and models of gears, pulleys, shafts, bearings and couplings.
		LO3	Solve complex engineering problems in power transmission systems by applying engineering fundamentals.
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	Apply the suitable correlations to calculate the gearing ratio in the gear box and produce cost-effective solutions that meet specified needs with consideration for economic, environmental, within the principles and contexts of sustainable design and development.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO5	Analyze applications for different types of transmission systems by searching for information to develop knowledge and skills which lead to life-long learning.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO6	Design physical systems applicable to the specific discipline by applying the concepts of solid Mechanics, Material Processing, Material Properties, Measurements, Mechanical Design.
		LO7	Select and determine the materials and dimensions of each mechanical element of the transmission system with no power losses and achieve the lower cost.
B3		LO8	Select the suitable type of mechanical elements (gears, pulleys, belts,

	Select conventional mechanical equipment according to the required performance.		bearing and couplings) according to the required performance.
		LO9	Select a suitable design method for conventional transmission systems according to the required performance.

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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	-Introduction to machine design concepts. - Simple, variable, fatigue vs. static stresses.	4	2	2	-
2	Shaft definition, uses, types, materials. - Shaft material selection principles	4	2	2	-
3	Shaft diameter calculation under static loading	4	2	2	-
4	- Design and calculate the diameter of shafts in Fatigue conditions. - Draw Torque and bending Moment diagram for designed shaft.	4	2	2	-

5	Calculate the factor of safety which guarding the shaft from fatigue failure according to failure theories.	4	2	2	-
6	- Meaning of gears, usages, types, shapes and different materials. - Spur gear selection.	4	2	2	-
7	Revision and Mid Exam				
8	- Calculate forces which apply to spur gears. Then select the suitable material. - Calculate and design dimensions of spur gears according to static bending stress. - Check the withstanding of previous calculated dimension by applying bending and surface durability fatigue stresses.	4	2	2	-
9	- Meaning of pulleys, usages, types, shapes and different materials. - Belt shapes and material types.	4	2	2	-
10	- Calculate forces which apply to pulley and belt. Then select the suitable materials for both. - Calculate and design dimensions of pulley and belt. - Complete design of flat belt pulley. - Complete design of V-belt pulley. - Calculate the suitable number of belts that can transmit the input power.	4	2	2	-
11	- Meaning of Bevel gears, usages, types, shapes and different materials. - Bevel gear selection. - Difference between bevel gear and any other type of gears.	4	2	2	-
12	- Calculate forces which apply to Bevel gears. Then select the suitable material. - Calculate and design dimensions of Bevel gears according to static bending stress. Check the withstanding of previous calculated dimensions by applying bending and surface durability fatigue stresses.	4	2	2	-
13	- Meaning of Bearings, usages, types, shapes and different materials. - Difference between journal and roller bearings. - Calculate forces which apply to bearings. - Select the suitable bearing. - Calculate the subjected equivalent fatigue load that applied on the bearing. Select the suitable bearing number and dimensions.	4	2	2	-

14	- Design a complete transmission system including (Shafts, Gears, Pulley and Belts, Bearings) - Calculate the gearing ratio of the whole system. -Make a suitable design with maximum efficiency and low cost, achieving long lifetime of all components.	4	2	2	-
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 (quiz 1)	6	12.5	12.5 %
2	Exam 2 written (quiz 2)	14	12.5	12.5 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments	2,3,4,5,10,12	5	5 %
6	Project Sheet	13	10	10 %

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)	Mott, Robert L. <i>Machine Elements in Mechanical Design</i> , 6th edition, Pearson Education. Published by Pearson (August 1, 2021).
	Other References	1-Mechanical Engineering Design (McGraw-Hill Series in Mechanical Engineering) 11th Edition. 2020. -UR.S.Khurmi , J.K.Guptal Textbook Machine Design I , I Macraw – Hill Publishing Company Limited 1979 .
	Electronic Sources (Links must be added)	Microsoft Teams
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities &	Devices/Instruments	Data- show laptops
	Supplies	White board

equipment for teaching and learning *	Electronic Programs	N/A
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Asso. prof. Marwa Elmahdy	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	CAD/CAM			
Course Code (according to the bylaw):	ENG 247			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	2	-	3
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Hossam Ramadan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Product cycle, collecting of relevant information of design part, Geometric modeling of the component using graphic software(wireframe, surface, solid) ,mechanism analysis of the assembly- Parts, Force and stress analysis of designed Part, Optimum design and graphical evaluation of the model ,documentation of the designed part (views ,sectional

views , 2d draw). Computer aided manufacturing (CNC Computer numerical control coded program, computer aided process planning CAPP, Robotics)

3. Course Learning Outcomes CLOs :

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

Program Outcomes (ARS) (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	Evaluate various types of CNC machines and programming methods to generate G-code
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO2	Demonstrate alternative design solutions using CAD software and communicate results graphically
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO3	Apply computer-aided programs to design components and implement CNC code for manufacturing

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 Product Cycle – Concept, Stages, Relevance in CAD/CAM	3	1	-	2
2	Collecting Relevant Information of the Design Part – Sources, Criteria, Practical Aspects	3	1	-	2
3	Geometric Modeling – Wireframe, Surface, Solid Modeling Techniques	3	1	-	2
4	Design using Graphic Software – (e.g., SolidWorks/AutoCAD) – 2D & 3D modeling	3	1	-	2
5	Mechanism Analysis of the Assembly – Movement, Joints, Constraints	3	1	-	2
6	Force and Stress Analysis – Simulation Tools, Safety Factors	3	1	-	2
7	Revision and Mid Exam				
8	Optimum Design and Graphical Evaluation – Design Iteration, Performance Curves	3	1	-	2

9	Documentation of Designed Part – Views, Sectional Views, Dimensions, 2D Drawings	3	1	-	2
10	Introduction to CNC (Computer Numerical Control) – Definition, Structure	3	1	-	2
11	CNC Programming & G-Code Basics – Motion Commands, Toolpath	3	1	-	2
12	Advanced CNC Program – Subprograms, Loops, Canned Cycles	3	1	-	2
13	Computer Aided Process Planning (CAPP) – Integration of CAD/CAM	3	1	-	2
14	Robotics and CAM Applications – Industrial Use Cases, Simulation, Automation Concepts	3	1	-	2
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)	6	10	10 %
2	Exam 2 written (Semester work or quiz)	12	10	10 %
3	Midterm exam	7	30	30 %
4	Final Practical Exam	15, 16	30	30 %
5	Assignments / Project	14	20	20 %

6. Learning Resources and Supportive Facilities *

Learning resources	The main (essential) reference (must be written in full according to the scientific documentation method)	-Mikell P. Groover, "Automation, Production System, and Computer-

(books, scientific references, etc.) *		integrated Manufacturing", Prentice Hall, 6 th edition. (2016).
	Other References	-Mikell P. Groover, Emory W. Zimmers, Jr, " CAD/CAM Computer-Aided Design and Manufacturing", Prentice Hall., (1984). -Ibrahim Zeid — Practical CAD/CAM in Industry Macraw – Hill Publishing Company Limited,(1995).
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	BOXFORD CNC LATHE and MILLER MACHINE
	Supplies	Data show
	Electronic Programs	Microsoft Teams
	Skill Labs/ Simulators	BOXFORD V.10
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Hossam Ramadan	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Bachelor Project			
Course Code (according to the bylaw):	MEC 245			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	4	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Radwa A. Ghazalla			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

In this course, each student is assigned to one or more academic advisor(s). A project related to Mechanical Engineering is selected in line with the student's interests and the department's research or industrial priorities. Preference is given to projects linked with real industrial problems. The student should show how the following are considered in his work,

During the course, students are required to:

- Write a project proposal with a suggested time plan.
- Conduct literature review and web-based search on related subjects.
- Perform analysis and design stages.
- Implement the project (hardware and/or software) according to the proposed methodology.

By the end of the course, students must submit:

- A comprehensive final written report.
- An oral presentation and defence before an examination board.
- A physical prototype or software model, as applicable.

The project should explicitly address the following aspects:

- Economic justification of the proposed solution.
- Quality assurance and management considerations.
- Safety requirements.
- Environmental impact.

The project completion demonstrates that students have:

- Understood both theoretical and practical aspects of the assigned problem.
- Acquired the ability to search, review, and integrate modern engineering technologies.
- Reached sound, practical, and useful engineering conclusions.
- Developed effective communication, presentation, and project documentation skills

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A2, A5, A6,A9, B1 and 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	Analyze both theoretical and practical concepts of the project.

A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO2	Apply appropriate research methods to include recent developments in the final project report.
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements	LO3	Supervise the application of quality management and assurance systems throughout the project phases.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO4	Plan project tasks, resources, cost, and duration prior to implementation.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations	LO5	Prepare a comprehensive technical report using standard scientific, engineering, and graphical conventions.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	LO6	Demonstrate technical writing skills to effectively document engineering project outcomes.

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	Discussion about the method of selecting the graduation project	4	-	-	4
2	Discussion about the method of selecting the graduation project	4	-	-	4
3	Assign the references to students to collect data about the project	4	-	-	4
4	Assign the references to students to collect data about the project about the project	4	-	-	4
5	Sampling the data collected to determine the scope of the work	4	-	-	4
6	Theoretical explanation for literature reviews from the previous works	4	-	-	4
7	Set a timetable for project.	4	-	-	4
8 Up to 26	Implementation of the project and processing requirements	80	-	-	80
27	Analyze the main findings	4	-	-	4
28	Summarize the main findings in the form of curves, tables and charts	4	-	-	4
29	Preparing for presentation	4	-	-	4
30	Final evaluation of Committee arbitration	-	-	-	-
31	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)	--	--	--
2	Exam 2 written (Semester work or quiz)	--	--	--
3	Midterm exam	--	--	--
4	Final Written Exam	--	--	--
5	Summarize the main findings in a form of curves, tables and charts	28	40	40%
6	Case study	--	--	--
7	Thesis / Project /Portfolio/ Logbook	30	20	20%
8	Field training	--	--	--
9	Other (Final oral)	31	40	40%

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)	Supervision and Academic Guidance – Each student (or group) is assigned an academic supervisor who provides regular feedback, technical support, and project direction throughout the term
	Other References	Reference Books and Journals – Access to a wide collection of textbooks, handbooks, and academic journals through the university library and digital databases (e.g., IEEE Xplore, ScienceDirect, SpringerLink)
	Electronic Sources (Links must be added)	Scientific Research Databases – Access to research databases for literature reviews and citation management (e.g., Google Scholar, Scopus, Mendeley, EndNote). Previous Project Archives – Availability of previous bachelor projects and theses as references for methodology, formatting, and scope setting.
	Learning Platforms (Links must be added)	EKB - IEEE Xplore, ScienceDirect, and SpringerLink

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Mechanical/electrical workshops for prototyping, including 3D printers, CNC machines, PCB design tools, and welding stations
	Simulation and Testing Facilities	Labs equipped with wind tunnels, hydraulic benches, testing rigs, and sensors (depending on project type)
	Electronic Programs	simulation, and data analysis software (e.g., AutoCAD, SolidWorks, MATLAB, ANSYS, LabVIEW, SPSS)
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (Support from Technical Staff)	Availability of lab technicians and engineers for technical support in handling lab equipment and safety procedures

	Course Coordinator	Program Coordinator
Name	Dr. Radwa A. Ghazalla	Dr. Mohamed Ashraf
Signature	Radwa Ghazalla	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Maintenance and fault diagnosis			
Course Code (according to the bylaw):	ENG 245			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	3	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof. Dr. Mona A. Younis			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Introduction to maintenance concepts and to maintenance management systems -
Maintenance policies and strategies - Reliability theory and assessment of availability
and performance of machinery - Essence of maintenance planning and administration -

Predictive maintenance and fault diagnosis methodologies - Study of vibration and acoustic analysis.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A3 & A5, B1)		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 concept of maintenance and identify its main types.
		LO2	Differentiate maintenance from repair.
		LO3	Classify preventive maintenance strategies.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO4	Explain the duties of a maintenance engineer and describe basic planning techniques.
		LO5	Demonstrate maintenance planning and administration using case examples.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO6	Analyze challenges of vibration monitoring in machinery.
		LO7	Identify vibration transducers used in condition monitoring.

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 maintenance concepts, repair vs maintenance	4	1	1	2
2	Maintenance policies and types (Corrective vs Preventive)	4	1	1	2
3	Preventive maintenance types and strategies	4	1	1	2
4	Condition-based and predictive maintenance	4	1	1	2
5	Reliability theory: failure rates, MTBF, availability	4	1	1	2
6	Maintenance organization & roles: duties of maintenance engineers	4	1	1	2
7	Revision and Mid Exam				

8	Maintenance planning and administration systems	4	1	1	2
9	Maintenance planning continued + KPIs	4	1	1	2
10	Introduction to machinery vibration and basics of dynamic behavior	4	1	1	2
11	Vibration monitoring techniques	4	1	1	2
12	Vibration transducers and data acquisition	4	1	1	2
13	Portable handheld vibration instruments and applications	4	1	1	2
14	Final revision (case studies linking all concepts)	4	1	1	2
15,16	Final Exam.				

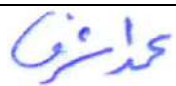
5- methods of student passements

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)	10	10	10%
3	Midterm exam	7	30	30 %
4	Final Written Exam	15, 16	30	30 %
5	Assignments / Project /Portfolio/ Logbook	12	10	10%
6	presentation	12	10	10%

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)	Chen, G. S. (2025). <i>Handbook of Friction Vibration Interaction</i>
	Other References	- Narayan, V. (2004). <i>Effective Maintenance Management: Risk and Reliability Strategies for Optimizing Performance</i> . Industrial Press. -Leavitt, J. (2002). <i>Complete Guide to Predictive and Preventive Maintenance</i> . Industrial Press.
	Electronic Sources (Links must be added)	N/A

	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	N/A
	Supplies	.Data-show and laptop
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	Fault diagnosis equipment available in lab.
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Assoc. Mona A. Younis	Dr. Mohamed Ashraf
Signature	MONA A. YOUNIS	

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	اخرى (تحدد)	عملي	نظري	إجمالي عدد الساعات المعتمدة للمقرر: (تبعاً لما ورد باللائحة)
1	0	0	1	
اجباري				نوع المقرر:
SENIOR 2				المستوى الدراسي الذي قدم فيه المقرر:
الهندسة الميكانيكية				البرنامج الأكاديمي:
المعهد التكنولوجي العالي				المعهد:
ا.م.د/ امل الدسوقي				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 للمحتوي العلمي) :

نظرة عامة على علم الهندسة ومهنة المهندس: علم الهندسة قاطرة الحضارة للأمم منذ فجر التاريخ - مهنة المهندس من أرقى وأسمى المهن عموماً (تستند إلى الإبداع والابتكار والتطوير الذي يضيفه كل مهندس من فكره الخاص - تخدم البشرية كلها وتسعى إلى الجودة في حياة الإنسان عموماً) (مسؤوليات المهندس دولياً ومحلياً: الدور الهام للمهندس طبقاً للعقود الهندسية الدولية (فيديك) (FDIC) - مسؤولية المهندس وفقاً للقوانين المصرية. أخلاقيات وأداب المهنة: نظرة شاملة على قانون نقابة المهندسين رقم 66 لسنة 1974 - التأكيد على أهداف النقابة وواجبات أعضائها كما وردت بالقانون - وضع ميثاق شرف يجمع ما يجب أن يتحلى به المهندس من أخلاق وصفات وأداب

3- نواتج التعلم للمقرر:

اتساق نواتج التعلم للمقرر مع مخرجات البرنامج (المعايير المتبناة)

نواتج التعلم للمقرر		مخرجات البرنامج / المعايير الأكاديمية المتبناة (التي يحققها المقرر تبعاً للمصفوفة في توصيف البرنامج)	
عند الانتهاء من المقرر سيكون الطالب قادراً على		A9, A10	
النص	الكود	النص	الكود
يوضح طبيعة وظيفة المهندس كدور مهني يجمع بين الإبداع والمسؤولية الاجتماعية.	LO1	استخدم التفكير الإبداعي والمبتكر والمرن، واكتسب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها. استخدم التفكير الإبداعي والمبتكر والمرن، واكتسب مهارات ريادة الأعمال والقيادة لتوقع المواقف الجديدة والاستجابة لها.	A9
يميز بين المسؤوليات المهنية للمهندس في السياق المحلي والدولي، بما في ذلك عقود الفيديو والقوانين المصرية.	LO2	اكتسب وطبق معارف جديدة، ومارس استراتيجيات التعلم الذاتي، والتعلم مدى الحياة، وغيرها.	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 بالإنترنت	برامج المحاكاة أو النمذجة	المعامل الافتراضية	التعلم الإلكتروني	الذكاء الاصطناعي في التعليم
✓		✓	✓		✓	✓	✓			✓				✓	

الجدول الدراسي للمقرر:

رقم الاسبوع الدراسي	المحتوى العلمي للمقرر (موضوعات المقرر)		إجمالي عدد الساعات الأسبوعية	عدد ساعات التعلم المتوقعة	
				تدريس نظري	تدريب
عملية	تمارين	عملية	عملية	عملية	عملية
1	0	0	1	1	0
2	0	0	1	1	0
3	0	0	1	1	0
4	0	0	1	1	0
5	0	0	1	1	0
6	0	0	1	1	0
7	مراجعة وامتحان منتصف الفصل الدراسي				
8	0	0	1	1	0
9	0	0	1	1	0
10	0	0	1	1	0
11	0	0	1	1	0
12	0	0	1	1	0
13	0	0	1	1	0
14	0	0	1	1	0
-15 16	إختبارات الفصل الدراسي النهائية				

5- طرق تقييم الطلاب:

م	طرق التقييم *	توقيت التقييم المتوقع (رقم الأسبوع الدراسي)	درجات التقييم	النسبة المئوية 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 الأنشطة	13 و 14	20	20 %

* الطرق المذكورة هي أمثلة استرشادية، ويجوز الإضافة والحذف

6- مصادر التعلم والتسهيلات المادية:

Mappes, Thomas A. Biomedical Ethics. 1st ed., Butterworth, 1999	المرجع الأساسي للمقرر (لا بد من كتابة البيانات كاملة وفقا لطريقة توثيق علمي)	مصادر التعلم (الكتب والمراجع العلمية وغيرها) *
السامرائي، مهدي صالح مهدي. أخلاقيات العمل. دار صفاء للنشر والتوزيع، 2021.	المراجع الأخرى	
اخلاقيات العمل - د. مهدي صالح مهدي السامرائي - Google Books	المصادر الالكترونية (لا بد من إضافة الروابط)	
EKB - Microsoft office	المنصة التعليمية (لا بد من إضافة الرابط)	
داتا شوه	الأجهزة	التجهيزات التعليمية المساندة للتعليم والتعلم *
	المستلزمات	
	البرامج الالكترونية	
	معامل المهارات/ المحاكيات	
	المعامل الافتراضية	
	أخرى (تذكر)	

* القائمة المذكورة هي أمثلة استرشادية ، ويجوز الإضافة والحذف تبعا لطبيعة المقرر (المراجع محدثة – بحد أقصى آخر 10 سنوات) مع إضافة أحد المراجع المتاحة بمكتبة المعهد.

منسق البرنامج	منسق المقرر	
د/ غادة كريم	ا.م.د/ امل الدسوقي	الإسم
غادة	امل	التوقيع

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Power Plants			
Course Code (according to the bylaw):	MEC 253			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Samy			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Steam generators - Rankin Cycle - Superheat, reheat, and feed water heaters – Cogeneration - Gas turbine cycles - Modifications of Brayton Cycle, combined cycles - Principles of Nuclear energy - Environmental aspects of power generation- Power plants economics.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, A10, B1, B3)		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 and basic science.	LO1	Analyze the operating cycles for steam, gas turbine, and combined-cycle power plants.
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	Apply various aspects of thermodynamics and heat transfer principles to the thermal design of power-generating cycles and diverse components of power plants.
A10	Acquire and apply new knowledge; and practice self, lifelong, and other learning strategies.	LO3	Evaluate plant design parameters and operational data to justify choices based on lifecycle cost, efficiency, and environmental impact.
B1	Model, analyze, and design physical systems applicable to the specific discipline by applying the concepts of Thermodynamics, Heat Transfer, Fluid Mechanics, Solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory, and Systems, Mechanical Design, and Analysis, Dynamics, and Vibrations.	LO4	Interpret the effect of various operating factors on the gross efficiency of power plants by applying the basic concepts.
		LO5	Analyze the station performance through the I/O, load, and load duration curves.
		LO6	Relates the power economics with the aid of the station performance and load curves.
B3	Select conventional mechanical equipment according to the required performance.	LO7	Plan capacity scheduling for units in a power plant utilizing the required aspect for load division.
		LO8	Manage the relation between power economics and the global economy.

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 Power Plants and Thermal Engineering + Steam power plant cycle and instrumentations	4	2	2	-
2	Rankine Cycle and its modifications + Analyzing the cycle of a steam power plant and utilizing the Mollier chart	4	2	2	-
3	Design and classification of steam condensers + Design and classification of feedwater heaters	4	2	2	-
4	Classification of steam generators (Boilers) + Design of Steam Generators (Boilers)	4	2	2	-
5	Introduction to Cogeneration cycles + Design and analysis of the Cogeneration cycle	4	2	2	-

6	Cycle of Gas-turbine power plants + Modifications on Cycle of Gas-turbine Power Plants	4	2	2	-
7	Revision and Mid Exam				
8	Analyzing the cycle of a gas-turbine power plant + Quiz 1	4	2	2	-
9	Introduction to Combined cycles. + Design and analysis of combined Power Plants.	4	2	2	-
10	Station performance + Quiz 2	4	2	2	-
11	I/O curve and various performance relations, Load curves	4	2	2	-
12	Introduction of Power Economics, Analysis of the cost per kWh	4	2	2	-
13	Analysis of cost per kWh, Basics and fundamentals of nuclear power plants	4	2	2	-
14	Nuclear power plants	4	2	2	-
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)	8	15	15%
2	Exam 2 written (Semester work or quiz)	10	5	5%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	40	40%
5	Assignments / Project /Portfolio/ Logbook	According to the schedule	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)	Zabihian, Farshid. <i>Power Plant Engineering</i> . CRC Press, 2021.
	Other References	Bedalov, Zark. <i>Practical Power Plant Engineering: A Guide for Early Career Engineers</i> John Wiley & Sons, 2020.
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	N/A
	Supplies	Data Show
	Electronic Programs	MS-Teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Sany	Dr. Mohamed Ashraf
Signature	أحمد سامي	محمد اشرف

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Fluid Machinery			
Course Code (according to the bylaw):	MEC 252			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Hany Yahya			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Principles of gas dynamics including shock waves and flow through nozzles and diffusers - Energy transfer considerations - Theory and design of pumps, turbines, and compressors - Performance characteristics and selection criteria - Operation and system contains them - Applications.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, 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 suitable fluid machines for engineering applications based on flow rate, head, and energy requirements.
		LO2	Solve performance equations of fluid machines using conservation laws, Euler's equation, and velocity triangles under different operating conditions.
		LO3	Evaluate fluid machine performance considering cavitation, efficiency losses, and instability using dimensional analysis and data interpretation.
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	Design fluid machinery systems (e.g., pumps, turbines) for real-world applications considering technical and economic constraints.
		LO5	Integrate sustainability aspects such as energy efficiency, environmental impact, and material selection in fluid machinery system design.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO6	Model fluid machinery systems using fluid mechanics and thermodynamics principles.
		LO7	Design turbomachinery components (e.g., impellers, blades, diffusers, casings) based on mechanical design and material properties.
		LO8	Select appropriate fluid machinery (pumps, turbines, compressors) for industrial applications based on flow rate, head, and performance 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to the course.	4	2	2	-
2	Review of gas dynamics.	4	2	2	-
3	Review of gas dynamics.	4	2	2	-
4	Computational fluid dynamics simulation.	4	2	2	-
5	Energy transfer in turbomachines.	4	2	2	-
6	Radial flow compressors and pumps.	4	2	2	-
7	Revision and Mid Exam				
8	Axial flow compressors and pumps.	4	2	2	-

9	Axial flow compressors and pumps.	4	2	2	-
10	Radial flow turbines.	4	2	2	-
11	Radial flow turbines.	4	2	2	-
12	Axial flow turbines	4	2	2	-
13	Efficiency of Turbomachines.	4	2	2	-
14	Compressor and pump selection.	4	2	2	-
15,16	Final Exam.				

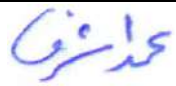
5- Methods of students' assessment:

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)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Portfolio/ Logbook	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)	Bansal, R.K., <i>A Textbook of Fluid Mechanics and Hydraulic Machines</i> , 11th edn (New Delhi: Laxmi Publications, 2023).
	Other References	1. R.S.Khurmi, —A Textbook of Hydraulics, Fluid Mechanics and Hydraulic Machines — S.Chand & Company LTD 19th ed .1997. 2. S.M.YAHYA, —Turbines Compressors and Fans —,Tata Mcgraw-Hill Publishing Company Limited, (1983). 3. Ji, J., Agarwal, R. and Yang, C., Design and Optimization of Fluid

		Machinery, 2nd edn, Singapore: Springer Nature, 2025.
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data-show and Laptop
	Supplies	White board
	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Hany Yahya	Dr. Mohamed Ashraf
Signature	Hany	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Production Engineering			
Course Code (according to the bylaw):	ENG 251			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. Prof.: Said H. Zoalfakar			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Non-traditional metal cutting, wire cut, laser cut, plasma cut, abrasive water jet. Welding, thermit welding, plasma welding, electron beam welding, friction stir welding Engineering. Metrology, techniques and applications of linear/angular measurement and limit gauging, measurement of surface finish, surface finish symbols and surface texture, error in measurements. Operations planning and cost estimating, the purpose of

operations sheet, operations sheet preparation. Course project, working drawing; tolerances, surface finish and operations sheet.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3& A10, B1, B3)		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	<i>Identify</i> various non-traditional metal cutting techniques such as wire cut, laser cut, and plasma.
		LO2	<i>Select</i> appropriate non-traditional cutting methods based on material and product requirements.
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	<i>Apply</i> engineering design principles to develop welding processes considering cost, performance, and safety.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	<i>Investigate</i> modern trends in metal forming and manufacturing processes through self-learning.
B1	Model, analyze and design material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis.	LO5	<i>Model</i> measurement processes using appropriate tools and standards in metrology.
		LO6	<i>Design</i> surface finish symbols, tolerance limits, and operations sheets for manufacturing systems.
B3	Select conventional mechanical equipment according to the required performance.	LO7	<i>Select</i> appropriate welding or cutting equipment based on operational requirements and technical specifications.

		LO8	<i>Evaluate</i> manufacturing processes based on productivity, efficiency, and cost estimation 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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to non-traditional machining techniques (wire cut, laser cut)	4	2	2	
2	Plasma cut, abrasive water jet	4	2	2	
3	Selection of non-traditional methods based on material properties	4	2	2	
4	Introduction to welding processes, thermit and plasma welding	4	2	2	
5	Electron beam welding, friction stir welding and sustainable welding design	4	2	2	
6	Self-learning and research task on advanced welding/cutting innovations	4	2	2	

7	Revision and Midterm Exam.				
8	Introduction to Metrology, linear and angular measurements	4	2	2	
9	Measurement errors, gauges, and instruments	4	2	2	
10	Surface finish, roughness parameters, and measurement tools	4	2	2	
11	Tolerances, surface texture, and surface finish symbols	4	2	2	
12	Operations planning and cost estimation: principles and calculations	4	2	2	
13	Equipment selection and performance-based process optimization	4	2	2	
14	Course project: develop working drawing with tolerances, surface finish, and operations sheet	4	2	2	
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)	5	10	10%
2	Exam 2 written (Semester work or quiz)	10	10	10%
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	sheets	13	10	10%
6	Assignments / Project	6,12	10	10%

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)	Groover, M. P. (2020). <i>Fundamentals of modern manufacturing: Materials, processes, and systems</i> (7th ed.). John Wiley & Sons.
	Other References	- H.M.T Bangalore , Production Technology”, Tata McGraw Hill, (1980).

		- J. Norrish, Advanced Welding Processes, JOHN WOOD, UK(1992). - E.J. Willer, Nontraditional Machining Processes, Society of publications/ Marketing Division, 1984 - Nee, A. Y. C. (2014). Handbook of manufacturing engineering and technology. Springer Publishing Company, Incorporated.
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office

	Course Coordinator	Program Coordinator
Name	Dr. Said zoalfakar	Dr. Mohamed Ashraf
Signature	سعيد ذو الفقار	محمد اشرف

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Machine Design (3)			
Course Code (according to the bylaw):	ENG 254			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. prof. Marwa Elmahdy			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Design review of the different machine elements–Design of the internal combustion engine (piston, cylinder block, connecting rod, crank shaft, cam shaft) –Design of automobile clutch - Design of braking system– Design of centrifugal water pump– Design of speed reduce.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, A10, B1, B3)		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 type of standardized and customized machine elements
		LO2	Identify the basic knowledge of materials science, mechanical strength and fatigue, know and understand to an advanced level the typical technologies of machine component manufacturing
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 stress analysis theory, fatigue theory and appropriate criteria of failure to the design of simple machine elements.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO4	Acquire the basics of engineering technologies, principles and techniques of internal combustion engine.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Design internal combustion engine parts, automobile clutch, brake system and centrifugal water pump
		LO6	Analyze appropriate calculations required for the selection of standard machine parts.
B3	Select conventional mechanical equipment according to the required performance.	LO7	Select appropriate mechanical components from manufacturers' catalogues

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	Review of the different machine elements	4	2	2	-
2	Shaft design	4	2	2	-
3	Shaft design cont.	4	2	2	-
4	Gear design	4	2	2	-
5	Gear design cont.	4	2	2	-
6	Review of the internal combustion engine	4	2	2	-
7	Revision and Mid Exam				
8	Design of the internal combustion engine (piston)	4	2	2	-
9	Design of the internal combustion engine (cylinder block)	4	2	2	-

10	Design of the internal combustion engine (connecting rod, crank shaft, cam shaft)	4	2	2	-
11	Design of automobile clutch	4	2	2	-
12	Design of braking system	4	2	2	-
13	Design of centrifugal water pump	4	2	2	-
14	Design of speed reducer	4	2	2	-
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 (quiz 1)	6	12.5	12.5 %
2	Exam 2 written (quiz 2)	14	12.5	12.5 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments	2,3,4,5,10,12	5	5 %
6	Project Sheet	13	10	10 %

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)	Mott, Robert L. <i>Machine Elements in Mechanical Design</i> , 6th edition, Pearson Education. Published by Pearson (August 1, 2021).
	Other References	Mechanical Engineering Design (McGraw-Hill Series in Mechanical Engineering) 11th Edition. 2020.
	Electronic Sources (Links must be added)	N/A
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data- show laptops
	Supplies	White board
	Electronic Programs	Microsoft Teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	Asso. prof. Marwa Elmahdy	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Combustion			
Course Code (according to the bylaw):	MEC 251			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Ahmed Hussein ElFeky			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

The course covers the thermodynamics of combustion and fuels. Chemical kinetics, fundamentals of gas dynamics, detonation and shock waves. Normal and detonating combustion, combustion in internal engines, gas turbines, and industrial, furnaces, alternate fuels.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, B3)		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 and basic science.	LO1	Explain the fundamental principles of combustion.
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	Analyze the heat release rate from fuel combustion and evaluate its influence on thermal efficiency.
		LO3	Determine the chemical equilibrium constant and its impact on the design and optimization of combustion systems.
B3	Select conventional mechanical equipment according to the required performance.	LO4	Calculate the equilibrium composition and heat output of combustion gases, and apply the results to assess system performance

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	Identify combustion process	4	2	2	-
2	Theoretical air combustion	4	2	2	-
3	Excess air combustion	4	2	2	-
4	Incomplete combustion	4	2	2	-
5	Gas analysis for output of combustion	4	2	2	-
6	Moisture air combustion	4	2	2	-
7	Revision and Mid Exam				
8	Dewpoint temperature for combustion gas	4	2	2	-
9	Higher heating value for fuel	4	2	2	-
10	Lower heating value for fuel	4	2	2	-

11	Adiabatic flame temperature	4	2	2	-
12	Adiabatic flame temperature	4	2	2	-
13	Equilibrium constant for combustion	4	2	2	-
14	Dissociation of combustion gases	4	2	2	-
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)	3	15	15%
2	Exam 2 written (Semester work or quiz)	11	15	15%
3	Midterm exam	7	20	20%
4	Final Written Exam	15, 16	40	40%
5	Final Practical/Clinical/... Exam	--	--	--
6	Final Oral Exam	--	--	--
7	Assignments / Project /Portfolio/ Logbook	According to the schedule	10	10%

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)	R. Yadav. <i>Internal Combustion Engines and Air Pollution & E-Vehicles: An innovative Approach</i> . IK International Pvt. Ltd, 2023.
	Other References	S. Turns and D. C. Haworth. <i>An Introduction to Combustion: Concepts and Applications</i> , McGraw Hill, 2021. - SPSHARMA, FUEL SAND COMBUSTION TATA MCGRAW- HILL PUBLISHING COMPANY LIMITED , (1984)
	Electronic Sources (Links must be added)	NA
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities &	Devices/Instruments	Data-show and Laptop
	Supplies	White board

equipment for teaching and learning *	Electronic Programs	Microsoft teams
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	NA

	Course Coordinator	Program Coordinator
Name	Dr. Ahmed Hussein ElFeky	Dr. Mohamed Ashraf
Signature	Ahmed Hussein Elfeky	

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Refrigeration and Air Conditioning			
Course Code (according to the bylaw):	MEC 256			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr/Moataz Mohamed Abd El-Raouf			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Refrigeration cycle analysis, refrigerants, equipment design and selection, cold stores, cryogenics and liquefaction of gases. Refrigeration cycle, performance, coefficient of performance. A study of the design of heating and cooling systems for residential and industrial applications. System components and analysis, heating and cooling load

estimates, detailed design calculations are conducted for the sizing of fan, ducts, pumps and piping. Air conditioning systems, performance, coefficient of performance.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1, A3, A10,B1, B3,B4)		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	Analyze some of Ideal thermodynamical cycles via recalling its performance relationships.
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	Estimate cooling capacity of refrigeration and air conditioning systems.
		LO3	Design air duct systems.
A10.	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO4	Describe the significance of energy-saving classes and inverter technology in domestic and industrial sectors, which supports the sustainability of refrigeration and air conditioning systems.
B1.	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties,	LO5	Compare the performance of Various refrigeration and air conditioning systems via common criteria.
		LO6	Analyze thermal analysis via analytical formulas necessary to complete the design process of refrigeration and air conditioning systems.

	Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO7	Determine the power and flow rate of thermodynamically open systems involved in refrigeration and air conditioning systems.
B3.	Select conventional mechanical equipment according to the required performance.	LO8	Clarify the significance of each component and accessory in terms of performance stability before categorizing and choosing them for usage in refrigeration and air conditioning systems.
		LO9	Classify air conditioning systems and choose the suitable techniques on the bases of zone characteristics and the overall cooling capacity needed in all the targeted spaces.
B4.	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to : design, build, operate, inspect and maintain mechanical equipment and systems.	LO10	Demonstrate "ASHRAE" as the most widely used international standard in the field of air conditioning.

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	*Revision on: Heat transfer modes- Energy vs Power(units) + Electricity bill calculation criteria. *Introduction to basic thermal cycles+ Air refrigeration systems.	4	2	2	-
2	Ideal Vapor compression refrigeration system +refrigerant Properties.	4	2	2	-
3	Modified Vapor compression refrigeration system + Online Quiz	4	2	2	-
4	Actual Vapor compression refrigeration systems.	4	2	2	-
5	Classification of basic components of vapor compression systems + Inverter Compressors criterion.+ Online Quiz	4	2	2	-
6	Accessories of VCC+ Vapor absorption cycle.	4	2	2	-
7	Revision and Mid Exam				
8	Introduction to HVAC (Heating, ventilation, and air conditioning) systems + Classification of air conditioning systems. (I. Unitary)	4	2	2	-
9	Classification of air conditioning systems. (II. Central) + Air psychometry.	4	2	2	-
10	Single and combined air conditioning processes using psychrometric chart. + Online Quiz	4	2	2	-
11	Building Survey and human comfort + Heat Gain and Thermal load estimation.	4	2	2	--
12	Cooling load Calculation sequence .	4	2	2	
13	Air Duct design.+ Online Quiz	4	2	2	-
14	Revision	4	2	2	-
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)	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	Exam 4 written (Semester work or quiz)	13	10	10%
5	Midterm exam	7	20	20 %
6	Final Written Exam	15, 16	40	40 %

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)	*Arora, R. C. (2021). <i>Refrigeration and air conditioning</i>. PHI Learning. *Khurmi, R. S., & Gupta, J. K. (2006). <i>Textbook of refrigeration and air conditioning</i>. S. Chand Publishing. *Dossat, R. J., & Horan, T. J. (2001). <i>Principles of refrigeration</i> (5th ed.). Prentice Hall.
	Other References	ASHRAE. (2023). <i>ASHRAE handbook: Fundamentals</i> . American Society of Heating, Refrigerating and Air-Conditioning Engineers.
	Electronic Sources (Links must be added)	• https://www.ashrae.org/ • https://www.youtube.com/c/danfoss
	Learning Platforms (Links must be added)	EKB - Microsoft office

	Course Coordinator	Program Coordinator
Name	Dr. Moataz Mohamed Abdel-Raouf	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Renewable Energy			
Course Code (according to the bylaw):	MEC 257			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Mohamed Salah			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Introduction, Renewable energies; Solar, wind, Biomass, geothermal, Tidal, Oceans wave, hydrogen. The sun structure, solar constant, collectors, collector performance, Heat removal factor. Applications, Design consideration of wind energy, site selection, available wind power, Applications, Biomass conversion to fuel, storage of energy. Economics.

3. Course Learning Outcomes CLOs :

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A1,A3,A10,B1,B3)		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 a broad range of renewable energy interventions to address specific energy requirements, particularly related to solar, wind and hydro sources.
		LO2	Evaluate the sustainability challenges associated with different renewable energy technologies.
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 industry-standard modelling software to compile and simulate basic renewable energy systems.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	LO4	Analyze renewable energy applications by independently searching, interpreting, and applying information to support continuous learning.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO5	Analyze the functional and operational aspects of renewable energy applications using basic engineering principles.
		LO6	Design practical renewable energy systems that meet specified performance and environmental criteria.

B3	Select conventional mechanical equipment according to the required performance.	LO7	Select appropriate components for renewable energy systems based on system requirements and performance criteria.
		LO8	Select the design methodology of conventional solar collectors according to performance needs.

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 the course. Sources of renewable energy.	4	2	2	-
2	Available solar energy and solar constant.	4	2	2	-
3	Types of solar collectors.	4	2	2	-

4	Flat plate solar collector performance.	4	2	2	-
5	Solar heating systems.	4	2	2	-
6	Solar heating systems.	4	2	2	-
7	Revision and Mid Exam				
8	Photovoltaic technology.	4	2	2	-
9	PV panel's structure.	4	2	2	-
10	PV system components.	4	2	2	-
11	PV system design.	4	2	2	-
12	Available wind energy.	4	2	2	-
13	Applications of wind energy.	4	2	2	-
14	Applications of wind energy.	4	2	2	-
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)	5	10	10 %
2	Exam 2 written (Semester work or quiz)	10	10	10 %
3	Midterm exam	7	20	20 %
4	Final Written Exam	15, 16	40	40 %
5	Assignments / Project /Portfolio/ Logbook	as per schedule	20	20 %

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific	The main (essential) reference (must be written in full according to the scientific documentation method)	Sørensen, B. (2017) Renewable Energy: Physics, Engineering, Environmental Impacts, Economics and Planning. 5th edn. London: Academic Press.

references, etc.) *		Duffie, J.A., Beckman, W.A. and Blair, N. (2020) Solar Engineering of Thermal Processes, Photovoltaics and Wind. 5th edn. Hoboken, NJ: John Wiley & Sons.
	Other References	Le Gourieres, D. (1982) Wind Power Plants: Theory and Design. Oxford: Pergamon Press. S. P. Sukhatme, Solar Energy, Tata McGraw-Hill.(2008) A. E. Dixon, J. D. Leslie, Solar Energy Conversion, eBook (1797), ISBN: 9781483189284. Mukund R. Patel , Wind and Solar Power Systems, Technology & Engineering.(1999) H. Messel, S. T. Butler, Solar Energy, Pergamon International Library of Science, Technology, Engineering and Social Studies (1975), eBook ISBN: 9781483187723. G.Tully, Solar heating systems: Analysis and design with the Sun-Pulse method (An Energy learning systems book).(1981) Farah Ejaz Ahmed, Raed Hashaike, Nidal Hilal, Solar powered desalination – Technology, energy and future outlook, . Desalination 453 (2019) 54-76. John R. Howell, Richard B. Bannerot, Gary C. Vliet, Solar Thermal Energy Systems, eBook (1982), New York : McGraw-Hill, c1982.
		Electronic Sources (Links must be added)
		None
		Learning Platforms (Links must be added)
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data Show
		N/A
		MS-Teams
		N/A
		N/A
		N/A

	Course Coordinator	Program Coordinator
Name	Dr. Mohamed Salah	Dr. Mohamed Ashraf
Signature		

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Advanced Quality Control			
Course Code (according to the bylaw):	MNG 251			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	2	-	4
Course Type:	Elective			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Dr. Hassan Gassour			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

Introduction To Statistical Quality Control- Statistical Techniques- Measures of Central Tendency- Measures of Dispersion- Probabilities- Standard Probability Density Functions- Binomial Distribution- Poisson Distribution- Normal Distribution- The General Theory of Quality Control Charts- Control Charts for Attributes (P-Chart & C-Chart) - Control Charts for Variables (X-Chart & R-Chart) – Sampling Inspection-Quality Improvement techniques.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A6, 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.	LO1	Understand the principles of statistical quality control and Six Sigma methodologies
		LO2	Identify advanced quality planning and control methods applicable in industrial contexts
		LO3	Explain the principles of acceptance sample and reliability testing
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO4	Understand the principles of statistical quality control and Six Sigma methodologies
		LO5	Design an effective quality assurance plan using modern techniques
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	LO6	Analyze process data using statistical methods to make decisions on quality improvement
		LO7	Select appropriate quality control tools for different production scenarios

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 (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures)	Training	
				Tutorial	/ Practical Lab
1	Introduction to Quality and Quality Systems	4	2	2	-
2	Review of Probability and Statistics in QC	4	2	2	-
3	Control Charts for Variables ($\bar{X}$ and R, $\bar{X}$ and S)	4	2	2	-
4	Control Charts for Attributes (p, np, c, u)	4	2	2	-
5	Process Capability Analysis	4	2	2	-
6	Acceptance Sampling: Single, Double, and Sequential	4	2	2	-
7	Revision and Mid Exam				
8	Advanced Sampling Plans and OC Curves	4	2	2	-
9	Six Sigma Methodology and DMAIC	4	2	2	-
10	Reliability and Failure Analysis	4	2	2	-
11	Total Quality Management (TQM) Concepts	4	2	2	-

12	Statistical Software for Quality Control (Minitab/SPSS)	4	2	2	-
13	Design of Experiments (DOE) in Quality	4	2	2	-
14	Case Studies on Industry and Quality Control	4	2	2	-
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)	5	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 /Portfolio/ Logbook	14	10	10 %

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)	Statistical Quality Control: A Modern Introduction, by Douglas C. Montgomery, 8 th Edition, 2024, Wiley.
	Other References	1- Eugene I. Grant & Richard S. Leavenworth —Statistical Quality Control —McGraw Hill. 2- Douglas C. Montgomery —Statistical Quality control —Joh Wiley & Sons Inc.
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show Internet connection
	Supplies	N/A
	Electronic Programs	MAT-LAB & MS-Teams
	Skill Labs/ Simulators	N/A
	Virtual Labs	N/A
	Other (to be mentioned)	N/A

	Course Coordinator	Program Coordinator
Name	DR. HASSAN GASSOUR	DR. MOHAMED ASHRAF
Signature		

المستوى الرابع (SENIOR 2)

فصل دراسي ثالث (تدريب)-نموذج هيئة جديد

Higher Technological Institute (HTI) – 10 th of Ramadan City	
Course Specification	

1. Basic information:

Course Title (according to the bylaw):	Field Training (4)			
Course Code (according to the bylaw):	FTR 261			
Department/s that participated in the teaching:	Mechanical Engineering			
Total number of credit hours of the course: (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	-	18	-	18
Course Type:	Compulsory			
The level to which the course was introduced:	SENIOR 2			
Academic Program:	Mechanical Engineering			
Institute:	Higher Technological Institute			
Name of Course Coordinator:	Assoc. prof. Amr Hassaan			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	The division council minute of department			
Course Specification Approval Date:	8/12/2025			

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

The student operates an integrated system or part of it, within a production unit in his area of specialization and participates in system maintenance and fault diagnosis. He also studies the techniques and tests required for quality control of the product. Duration

of the industrial training is eighteen hours per week over a minimum of five days for one academic term.

3. Course Learning Outcomes CLOs:

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

Program Outcomes (NARS) (according to the matrix in the program specs)		Course Learning Outcomes	
(A4, A5, A6, A10, B1)		Upon completion of the course, the student will be able to:	
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	Apply academic knowledge to solve practical problems in industrial training.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	LO2	Investigate unfamiliar tasks to acquire new knowledge and skills for future applications.
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO3	Comply with safety laws, rules, and regulations during field practice.
		LO4	Identify project needs and required materials in the production unit.
A10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	LO5	Utilize computer-aided design (CAD) systems in industrial tasks.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	LO6	Design mechanical systems by applying the fundamental concepts of mechanical sciences.

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:

Scientific topics depend on the defined training field/site

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	Train on the overall mechanical and flowchart of processes	18			18
2	Train on the overall mechanical and flowchart of processes	18			18
3	Carry out research using granted internet sites for references related to students' training process	18			18
4	Mid Exam				
5	Train on how to write scientific report	18			18
6	Write technical report	18			18
7	Review and practice the gained skills	18			18
8	Final Evaluation.				

5- Methods of students' assessment:

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	On site evaluation	3	20	20 %
2	Midterm exam	4	20	20 %
3	Final Oral Exam	8	30	40 %
4	Attendance	7	10	10 %
5	Training report discussion	7	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)	Provided by the training site
	Other References	Training handouts
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	EKB - Microsoft office
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Data show Internet connection
	Supplies	
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

	Course Coordinator	Program Coordinator
Name	Dr. Amr Hassaan	DR. MOHAMED ASHRAF
Signature		