The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 101: Art and Architecture

Program(s) on which this course is given	All Programs
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Art and Architecture			**Course Code:**		ARE 101	
Program /level	Architectural Engineering			**Sophomore/Junior**			
Term/ Academic year:	Oct–Jan 2023–2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	2	**Tutorial:**	1	**Laboratories:**	0
Pre-Requisite	---						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Learn about art and architecture with their concepts throughout the ages
- Link the arts to architecture
- Discuss about the various art schools of architecture and arts
- Access to valid design foundations to achieve aesthetics and creativity of architectural art formations

2- Course Learning Objectives (CLO):

At the end of this course, the student should be able to:

CLO 1. Recognize the impact of fine arts such as the painting-sculpture-photography-interior design on architecture during various historical eras.

CLO 2. Link architectural art supplements to the architectural design of the project

CLO 3. Influence of modern schools and their impact on architectural art formations

CLO 4. Identify the aesthetics and creativity of contemporary and future architecture.

3- ***Relationship between the course and the Competencies***:

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A1, A5, A9, A10	-----

4- ***Mapping Course Los to NARS***

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**A1.** Identify, formulate, and solve complex engineering problems by applying basic science and mathematics engineering fundamentals.	**LO1.** Identify art and architecture with their concepts throughout the ages **LO2** Solve complex problems in art forms in buildings.
	A5. Practice research techniques and methods of investigation as an inherent part of learning .	**LO3.** Practice research techniques in painting-sculpture-photography-interior design related to architecture .
	A9. Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.	**LO4.** Communicate effectively with audiences by different techniques of art direction in various buildings.
	A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies	**LO5.** Acquire new knowledge from various art schools of architecture and arts. **LO6.** Practice design ideas by special application of art forms in different architectural styles.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

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.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			**LOs Covered by Course**
			Let	**Tut.**	**Lab.**	
Week -1	Trends of art and architecture across different historical eras.	2	2	1	0	**LO 1, LO 4**
Week-2	Fine Arts (Sculpture - Drawing - Photography - Interior Design.....) Its relationship to architecture	2	2	1	0	**LO 3, LO 5**
Week-3	Artistic movements of the twentieth century and their influence on architecture art	2	2	1	0	**LO 4, LO 5**
Week-4	Modern School Trends (De Steel - Bauhaus _ and Their Impact on Architecture Arts).	2	2	1	0	**LO 1, LO 3 LO 5**
Week5	**Quiz 1**					
Week-6	Aesthetic features in architectural art formations that complement different design ideas	2	2	1	0	**LO1, LO 5**
Week-7	The foundations of the aesthetics of artistic architectural formations of (variation, poise, rhythm.....)	2	2	1	0	**LO1, LO 5**
Week-8	**Mid Term**					
Week-9	Analyze horizontal projection of formations of architectural forms that fulfill the principle of design	2	2	1	0	**LO 4, LO 6**
We-10	The relationship between creativity in arts and architectural design	2	2	1	0	**LO 2, LO 6**
Week-11	Aesthetic features in contemporary and future architecture arts	2	2	1	0	**LO1, LO 5**
Week-12	**Quiz 2:** semi final					
Week-13	Final project	2	2	1	0	**LO 1: LO 6**
Week-14	Revision.	2	2	1	0	----
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	------
2nd	----------	------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
CLO 1	●					●
CLO 2		●	●	●	●	
CLO 3			●		●	
CLO 4		●		●		●

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	Learning Outcome(LOs)					
	Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Face-to-Face Lecture	●		●	●	●	●
Online Education	●	●	●	●	●	●
Tutorial/ Exercise	●	●	●	●	●	●
Group Discussion	●	●	●	●	●	●
Laboratory						
Site Visit	●		●		●	
Presentation	●	●	●	●	●	●
Mini Project	●	●	●	●	●	●
Research and Reporting		●			●	
Brain Storming	●	●		●	●	●
Self-Learning			●	●		●

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	Learning Outcome(LOs)					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Written Exam	●	●	●		●	●
Online Exam						
Oral Exam	●	●	●	●	●	
Quiz	●	●	●		●	●
Lab Exam						
Take-Home Exam						
Research Assignment	●				●	●
Reporting Assignment	●	●	●	●	●	●
Project Assignment	●	●	●	●	●	●
In-Class Questions	●	●	●	●	●	●

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End-of-term laboratory exam (*Lab*)	**-**	15th	---
End of term Oral exam	**5**	15th	---
Tutorial and report assessment (*Term Work*)	**15**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

10.3. Recommended Books:

- **White, Edward T (1975):** A Vocabulary of Architectural Forms, Architectural Media.
- **William (Author) (2010):**The Art of Drowings, Madison Books; Revised ed. Edition.
- Architecture, Form, Space, and Order by Frank Ching
- **Linton, Harold(1985):** Color Model Environments: Color and Light in Three Dimensional Design, Harold Linton.
- **White, Edward T(1975),** A Vocabulary of Architectural Forms, Architectural Media.
- **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.
- **Bjone, Christian. Art and Architecture(2009):** Strategies in Collaboration. Basel.
- **British Pavilion(2018**): 50th Venice Biennale of Art." Colin Ledwith. Accessed April 18, 2018.

10.4. Web Sites:

- https://www.asla.org/
- http://www.ekb.eg/ar
- http://www.architectmagazine.com/
- http://en.wikipedia.org/wiki/Intelligent _design
- https://www.fosterandpartners.com/
- http://www.sagradafamilia.org/en/
- https://www.skyscrapercity.com/
- http://www.design-theory.com/
- http://www.usask.ca/education/ coursework/skaalid/theory/code/design ntheory.htm Nathan Shedroff (1994) Information Interaction Design: A unified field theory of design, Page 1-2. Retrieved November 2003 from

Course Directors	Name	Signature
Teaching staff	**Assoc. Prof. Sahar Ezz El Arab Ramadan**	
Course coordinator	**Assoc. Prof. Sahar Ezz El Arab Ramadan**	
Program Coordinator	**Dr. Mohamed Nabil El Sbaie**	
Head of Department	**Dr .Prof. Essam Kalifa**	
Date of approval	**Oct -Jan 2023 – 2024**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 111 : Fundamental of Architectural design

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Fundamental of Architectural design			**Course Code:**		ARE 111	
Program / level	Architectural Engineering			Sophomore			
Term/ Academic year:	Oct -Jan 2023 – 2024			**Credit Hours:**		3	
Contact Hours:	6	**Lecture:**	0	**Tutorial:**	6	**Laboratories:**	0
Pre-Requisite	---						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- An introduction to an architectural design consisting of simple designs, and projects include house, motel, villa.
- Understand the site's content and analysis of site planning elements.
- Study of structural coordination and construction technology.
- Explore the relationship between internal and external spaces.
- Study of pedestrian and vehicle traffic paths.
- An introduction to structural expressions in architecture.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Analyze design program and technical studies.

CLO 2. Conduct site planning analysis.

CLO 3. Produce simple building design elements.

CLO 4. Develop creative and innovative thinking in solving problems and making designs.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A2, A6, A7, A8	B1, B2

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**A.2**. 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.	**LO 1.** Search for information and engage in life-long self-learning discipline
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO 2.** Develop and present architectural and planning projects using an appropriate range of visual, verbal and written media, including both digital and non-digital methods
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 3**. Predict the neatness and aesthetics in design and approach. **LO 4.** The preparation and presentations of building design projects in a variety of contexts, and of diverse scale, complexity, and type

	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**LO 5.** Adopt innovative and new solutions in solving architectural and planning problems
COMPETENCIES of ARE	**B1.** Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies and human sciences.	**LO 3**. Predict the neatness and aesthetics in design and approach. **LO 6.** Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues. **LO 7.** Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
	B2. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 8**. Acquire entrepreneurial skills. **LO 9.** Topics related to humanitarian interests and moral issues.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The principal task of the architect is to design buildings which accommodate human activity. Drawing is its most expressive form. The course introduces the student to basic drawing skills and techniques. Fundamentals of architectural drawing; conventions of graphic representation, drawing as an important means to architecture, orthographic projection, architectural composition through abstract shapes and forms, study of architectural orders, architectural space, plan, section, elevation, sectional perspective, other graphic means. The techniques; line drawings, tone drawings, humanizing the drawing (figures, trees, plants, and furniture), efficiency in drawing, lettering.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab**	
Week -1	1st Design Program (Students Room) Brainstorming Research and project point with open discussion	3	0	6	0	**LO1, LO9**
Week-2	Studio Work – workshop group work Site selection and environmental analysis	3	0	6	0	**LO2**
Week-3	Feedback and Submission of 1st design sketches then dissemination of the updated program	3	0	6	0	**LO1, LO4**
Week-4	Research work and group discussion.	3	0	6	0	**LO2**
Week5	First sketches of plans Design of the plans and feedback	3	0	6	0	**LO2**
Week-6	**Quiz1**					
Week-7	**Midterm Exam.**					
Week-8	Development of plans, Lectures on Sections and elevations Lectures on Stairs	3	0	6	0	**LO2**
Week-9	Workshop and Development of plans, Preliminary Sections and elevations sketches	3	0	6	0	**LO3, LO4**
Week-10	Presentation of the 2nd design problem Dissemination of the 3rd program and discussions	3	0	6	0	**LO7**
Week-11	Final Design of plans, feedback and discussion	3	0	6	0	**LO5, LO3**
Week-12	Evaluation and discussion Development of plans and layout.	3	0	6	0	**LO5, LO3**
Week-13	Development of plans, sections, elevations and layout.	3	0	6	0	**LO7, LO8, LO6**
Week-14	Presentation of the 3rd design problem Project submission and feedback	3	0	6	0	**LO7, LO8**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
CLO 1	√		√					√	√
CLO 2	√	√		√		√			
CLO 3	√	√	√	√	√	√	√	√	√
CLO 4				√	√				

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)								
	General				ARE				
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Face-to-Face Lecture	√			√		√			
Online Education									
Tutorial/ Exercise	√	√	√	√	√	√	√	√	√
Group Discussion		√	√	√	√	√		√	
Laboratory									
Site Visit									
Presentation		√	√	√		√		√	
Mini Project		√	√		√		√		
Research and Reporting	√	√			√	√			
Brain Storming		√	√	√			√		
Self-Learning	√	√			√	√		√	√

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)								
	General				ARE				
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Written Exam			√	√	√	√			
Online Exam									
Oral Exam									
Quiz			√	√	√	√			
Lab Exam									
Take-Home Exam									
Research Assignment	√	√			√	√		√	√
Reporting Assignment		√			√	√			√
Project Assignment	√	√	√	√	√	√	√	√	√
In-Class Questions									

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	120 min.
Midterm written Exam (*Term Work*)	**30**	7th	120 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Final project	**20**		
Tutorial and report assessment (*Term Work*)	**15**	weekly	-
Quizzes/reports/presentation (*Term Work*)	**5**	6th	180 min.
Total Mark	**100**	**15th**	

9- Facilities Required:

A- White board
B- Projector
C- Seminar room, workshop room and drawing studio

10- List of References:

Course Notes:
• Sketches, lecture notes, presentations
Essential books (Textbooks):
• Neufert, E., Architect's Data, Crosby Lockwood Staples, London, (https://www.yumpu.com/en/document/view/64618918/ernst-neufert-architects-data 2020). • 2015 International Building Code Illustrated Handbook,1st Edition,125958612X · 9781259586125,By N/A International Code Council, Douglas W. Thornburg, John R. Henry, 2015 | Published: July 21, 2015 • Ching, Francis D. K.; Winkel, Steven R.2021"Building Codes Illustrated: A Guide to Understanding the 2021 International Building Code – Softcover" • Architecture: Form, Space, and Order 4th Edition,by Francis D. K.Ching (Author),2014
Recommended Books:
• Time-saver Standards for Building Types. (1980). United Kingdom: McGraw-Hill. • Architecture Competition: Project Design and the Building Process. (2017). United Kingdom: Taylor & Francis. • مجلة تصميم • كتاب تحليل الموقع للدكتور احمد عوف • Architecture Handbook • Vocabulary of Architecture
Periodicals, Websites:
• https://www.fosterandpartners.com/ • http://www.sagradafamilia.org/en/ • https://www.skyscrapercity.com/ • https://www.asla.org/ • http://www.ekb.eg/ar • http://www.architectmagazine.com/

Course Directors	Name	Signature
Teaching staff	**Dr.Mohamed Nabil El Sebai**	
Course coordinator	**Dr.Mohamed Nabil El Sebai**	
Program coordinator	**Dr.Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Essan Said Farag khalifa**	
Date of approval	**Oct -Jan (2023 – 2024)**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 112 : Building Construction and Materials (A)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Building Construction and Materials (A)			**Course Code:**		ARE 112	
Program / level	Architectural Engineering			**sophomore**			
Term/ Academic year:	Oct -Jan 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	0	**Tutorial:**	4	**Laboratories:**	0
Pre-Requisite	————						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- How to Apply the Two construction methods, (wall bearing and skeleton systems), And the sequence of building the various structural and non-structural elements of simple structures, and the external and internal stairs.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1.	Planning the implementation site and considering all security and safety requirements for workers and equipment. etc.
CLO 2.	Differentiate between the load-bearing construction system and structural buildings and the components and sequence of steps for each.
CLO 3.	Design and calculation of the details of internal and external stairs

3- ***Relationship between the course and the Competencies :***

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ChE
Program Academic Standards that the course contributes in achieving	A3, A4, A5, A7	B3

4- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	**LO 1.** Select the best structural system according to the type of building, as well as choose the appropriate foundation for the type of soil, to reach the highest quality and lowest cost.
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 2.** Discover the planning of the executive site, and the application of security and safety requirements inside and outside the site
	A.5. Practice research techniques and methods of investigation as an inherent part of learning.	**LO 3.** Determine the principles and basics of technical writing standards for scientific research.
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 4**. Illustrate the positive effects of cooperation and integration between workers in different disciplines in the various stages of the project from design to implementation, which leads to the completion of the task with high efficiency.
COMPETENCIES of ChE	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 5**. Choose the structural system that suits the architectural project. **LO 6**. Design internal and external stairs of buildings.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Introduction to two ways of construction: bearing & skeleton types; & sequence of constructing the various structural & nonstructural elements of simple structures. Stone& brick work, lintels, arches &centering. Wood, steel, reinforced concrete (flat roofs), exterior & interior stairways

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction and symbols used in different projections and different drawing lines, occupational safety and health guidelines and procedures, project implementation steps	2	0	4	0	**LO2, LO3**
Week-2	The sequence of construction work for structural and non-structural elements, equipment and tools used in implementation, types of structures and construction methods, buildings with load-bearing walls and all kinds of foundations (the foundations of load-bearing walls)	2	0	4	0	**LO1, LO4**
Week-3	Brickwork, Brick Bonding Methods Inside Walls (English and Flemish Continuous Bonding)	2	0	4	0	**LO1, LO5**
Week-4	The openings in the walls, door lintels and arches are made of bricks, building with stone, types of stones, arches of stone	2	0	4	0	**LO1, LO5**
Week5	Quiz 1	2	0	4	0	
Week-6	Structural buildings, foundations of all kinds (foundations of structural buildings), structural systems (solid slabs, flat slabs)	2	0	4	0	**LO1, LO5**
Week-7	Structural systems (Hollow block - paneled beams - frames systems, etc.)	2	0	4	0	
Week-8	**Midterm Exam.**					

Week-9	General review and delivery of the brickwork project	2	0	4	0	**LO1, LO2, LO3, LO4, LO5**
Week-10	Stairs, definitions of stair terms, stair design terms, different types of staircases	2	0	4	0	**LO5, LO6**
Week-11	Quiz 2	2	0	4	0	
Week-12	Examples of stairs design, concrete stairs details with cladding of (marble - stone - mosaic)	2	0	4	0	**LO5, LO6**
Week-13	Details of wooden and metal stairs	2	0	4	0	**LO5, LO6**
Week-14	General review and delivery of the staircase project	2	0	4	0	**LO3, LO6**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st		
2nd		

6- Matrix of Course Objective and Los

Course Learning Objectives	Learning Outcomes (LOs)					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
CLO 1	–	√	√	–	–	–
CLO 2	√	–	–	√	√	–
CLO 3	–	√	–	–	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)					
	Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Face-to-Face Lecture	√	√	√	√	√	√
Online Education	–	–	√	–	–	–
Tutorial/ Exercise	√	√	√	√	√	√
Group Discussion	–	–	–	–	–	–
Laboratory	–	–	–	–	–	–
Site Visit	–	–	–	–	–	–
Presentation	√	–	√	–	–	√
Mini Project	–	–	–	–	√	√
Research and Reporting	√	–	–	–	–	√
Brain Storming	√	√	–	√	–	–
Self-Learning	–	√	–	√	–	–

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)					
	Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Written Exam	√	√	√	√	√	√
Online Exam	–	–	–	–	–	–
Oral Exam	–	–	–	–	–	–
Quiz	√	√	√	√	√	√
Lab Exam	–	–	–	–	–	–
Take-Home Exam	–	–	–	–	–	–
Research Assignment	√	–	–	–	√	√
Reporting Assignment	–	–	–	–	–	–
Project Assignment	–	–	–	–	√	√
In-Class Questions	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**–**	**–**	**–**
End of term Oral exam	**–**	**–**	**–**
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- إنشاء مباني (تكنولوجيا البناء)، د. محمد أحمد عبدالله، مكتبة الانجلو المصرية.

10.2. Required Text Books and Additional References:

- تقنية معمارية (رسومات تنفيذية 2)، عمر 205، المؤسسة العامة للتعليم الفني والتدريب المهني، المملكة العربية السعودية.
- تقنية معمارية (انشاء معماري)، عمر 103، المؤسسة العامة للتعليم الفني والتدريب المهني، المملكة العربية السعودية.

10.3. Recommended Books:

- Construction Technology, an illustrated introduction, Eric Fleming 2005
- Architecture Structures Excerpts, G G Schierle, 2006.

Course Directors	Name	Signature
Teaching staff	Dr. Bassem Mohamed EL-sayed Kandel	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct .- Jan 2023-2024	

.The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 113: Free hand and architectural presentation

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Free hand and architectural presentation			**Course Code:**		ARE 113	
Program / level	Architectural Engineering			sophomore			
Term/ Academic year:	Oct -Jan 2023 – 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	0
Pre-Requisite							
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Define basic design principles, design elements, and configuration principles.
- Study of shape, materials and proportions
- Practice the gradient theory of display using different pencils.
- Apply design principles to 2D and 3D graphics
- Produce architectural sketches and models

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Apply basic design principles to the geometry of shapes.

CLO 2. Selection and evaluation of appropriate materials, proportions of geometric formations.

CLO 3. Practice gradient theory in different specific areas of design graphics.

CLO 4. Form geometric shapes in interior and exterior spaces with correct rules and theories.

CLO 5. Produce free hand 2D and 3D design drawings.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A7, A9	B1, B2

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 1**. Define and formulate the design **LO 2** take advantage of Principles of engineering design To emphasize a particular item in engineering formations and Graphics
	A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO3.**Develop appropriateness in the use of different pencils. **LO4.**Architecture Simulation **LO5**.Use statistical analyzes of Colors to emphasize pedigree and relationships Elements in engineering design.

		LO6. Communicate effectively with audiances by different techniques of colored drawings. LO 7. Using contemporary tools to present design projects and drawings .
COMPETENCIES of ARE	**B1.** Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies and human sciences.	**LO8.**Acquire new knowledge of colors and its effect to achieve the functional and aesthetic aspects of the various design elements **LO 9.** Practice design ideas in lifelong effect by special application of color choices in different architecture styles .
	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 10** . use enough knowledge of different gradients, shadow and light Studies in different cultures in appropriate design drawings.

- Course Content:

5.1. Course Description (As indicated in program Bylaw):

pencil points &line techniques , proportions & blocking in proportions , values & value scale , different planes , foreground , middle ground & background , depth , representation of buildings , building details& interiors, study of nature & tree representation study of factors leading to the artistic of sketches , sketching objects : & different architectural elements & nature . This is both in & out the studio by means of the pencil, charcoal, pen & ink , for training student's eyes & hands , & to let him achieve good proportions & beauty

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab**	
Week -1	1st Design Program (Students Room) Brainstorming Research and project point with open discussion	3	1	2	0	LO 1, LO 2
Week-2	Studio Work – workshop group work Site selection and environmental analysis	3	1	2	0	LO 3, LO 4, LO 5
Week-3	Feedback and Submission of 1st design sketches then dissemination of the updated program	3	1	2	0	LO 6, LO 7
Week-4	Research work and group discussion.	3	1	2	0	LO 1, LO 2 LO 3, LO 4, LO 5, LO 6, LO 7
Week5	First sketches of plans Design of the plans and feedback	3	1	2	0	LO2 ,LO3, LO7,LO10,
Week-6	**Quiz**					
Week-7	**Midterm Exam.**					
Week-8	Development of plans, Lectures on Sections and elevations Lectures on Stairs	3	1	2	0	LO2 ,LO3, LO7,LO10,
Week-9	Workshop and Development of plans, Preliminary Sections and elevations sketches	3	1	2	0	LO1, LO2 LO4, LO5
Week-10	Presentation of the 2nd design problem Dissemination of the 3rd program and discussions	3	1	2	0	LO5, LO7 LO8, LO10
Week-11	Final Design of plans, feedback and discussion	3	1	2	0	LO1, LO2 LO5, LO8 LO10
Week-12	Evaluation and discussion Development of plans and layout.	3	0	6	0	LO3, LO5 LO7
Week-13	Development of plans, sections, elevations and layout.	3	0	6	0	LO4, LO8 LO9,LO10
Week-14	Presentation of the 3rd design problem Project submission and feedback	3	0	6	0	LO4, LO8 LO9,LO10
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)									
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
CLO 1	✔			✔				✔		
CLO 2	✔				✔	✔	✔	✔	✔	✔
CLO 3		✔			✔			✔		✔
CLO 4		✔	✔	✔	✔				✔	
CLO 5	✔		✔	✔			✔	✔		✔

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)									
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
Face-to-Face Lecture	✔	✔			✔	✔		✔		
Online Education										
Tutorial/ Exercise	✔	✔	✔			✔		✔	✔	✔
Group Discussion				✔			✔			
Laboratory										
Site Visit	✔	✔							✔	✔
Presentation	✔	✔		✔				✔		
Mini Project					✔	✔	✔			
Research and Reporting	✔		✔	✔		✔	✔	✔	✔	✔
Brain Storming			✔							
Self-Learning				✔	✔			✔		

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)									
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
Written Exam	✔					✔	✔	✔	✔	✔
Online Exam										
Oral Exam	✔	✔		✔	✔	✔	✔			
Quiz		✔	✔				✔	✔	✔	✔
Lab Exam										
Take-Home Exam			✔				✔	✔		
Research Assignment	✔			✔	✔	✔				
Reporting Assignment		✔						✔		
Project Assignment		✔		✔	✔	✔	✔		✔	✔
In-Class Questions	✔	✔		✔		✔	✔			

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	120 min.
Midterm written Exam (*Term Work*)	**30**	7th	120 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**35**	weekly	-
Quizzes/reports/presentation (*Term Work*)	**5**	6th	180 min.
Total Mark	**100**	**15th**	

9- Facilities Required:

A- Seminar room, workshop room and drawing studio

10- List of References:

10.1. Course Notes:

- Sketches, lecture notes, presentations

10.2. Required Text Books and Additional References:

- Linton, Harold, Color Model Environments: Color and Light in Three-Dimensional Design, Harold Linton, 1985. • White, Edward T., A Vocabulary of Architectural Forms, Architectural Media, 1975
- **Architecture: Form, Space, and Order 4th Edition,**by Francis D. K. Ching (Author),2014, Publisher ,**Wiley,** ISBN-13**978-1118745083**
- **Archtects' Data by Ernst Neufert,2012, Fourth Edition language edition published by Blackwell Publishing Ltd 2012,ISBN: 978-1-4051-9253-8**
- **John Wiley & Sons, Inc., New York, NY. ARCHITECTURAL GRAPHIC STANDARDS,** SMITH MARAN ARCHITECTURE AND INTERIORS GRAPHICS EDITOR, **Edition11,2008, ISBN: 978-0-470-08546-2**

10.3. Recommended Books:

- عالم البناء
- مجلة تصميم
- كتاب تحليل الموقع للدكتور احمد عوف
- Architecture Handbook
- Vocabulary of Architecture

10.4. Web Sites:

- https://www.fosterandpartners.com/
- http://www.sagradafamilia.org/en/
- https://www.skyscrapercity.com/
- https://www.asla.org/
- http://www.ekb.eg/ar
- http://www.architectmagazine.com/

Course Directors	Name	Signature
Teaching staff	Dr.Mohamed Nabil El Sebai	
Course coordinator	Dr.Mohamed Nabil El Sebai	
Program coordinator	Dr.Mohamed Nabil El Sebai	
Head of the Department	Prof. Essan Said Farag khalifa	

Date of approval	Oct -Jan (2023 – 2024)

The Higher Technological Institute (HTI)	
Department: Department of Architecture Engineering	

Course Specification

ARE114: History of Architecture

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A–Basic information

Course Title:	History of Architecture			**CourseCode:**		ARE114	
Program/level	Architectural Engineering			**Sophomore year**			
Term/Academic year:	Oct.-Jan. 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	2	**Lecture:**	2	**Tutorial:**	-	**Laboratories:**	-----
Pre-Requisite	-						
Academic standards	(NARS2018)						
Bylaw Approval	2016						

1-CourseAims:

- Study the timeline of the evolution of architectural styles by studying the different following: Prehistoric architecture, Egyptian, Greek & Roman architecture, in addition to Christian architecture, Byzantine architecture, and Islamic architecture.
- The student should be able to learn and draw different architectural features of each period.

2-Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO1. Develop creativity by understanding the evolution of architectural forms through different stages and civilizations and analyzing buildings and their various elements.

CLO2. Strengthening students' architectural taste and sense through Studying and analyzing works as a product of different eras' environmental, cultural, religious, and social factors.

CLO3. Explain the relationship between architectural concepts, philosophy of design, and construction through different ages.

CLO 4. Show the effects of geographical, geological, climatic, social, historical, and religious on

different styles and architectural trends.

CLO 5. Summarize architectural values and ideas for each period to develop the present and foresee the future.

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of Architectural Engineering
Program Academic Standards that the course contributes in achieving	A8-A9	B1

3-***Mapping Course Los to NARS***

Field	Program (CBEs)that the course contribute in achieving	Learning Outcomes (LOs)
COMPETENCIES OF ENGINEERING	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO1.** Deduce the elements that influence architecture from different directions.
		LO 2. Compare the building environment and the architectural product of each period.
		LO3. Recognize the evolution of architecture and buildings.
	A10. Acquire and apply new knowledge and practice self, lifelong, and other learning strategies.	**LO 4.** Summarize architectural values and ideas for each period.
		LO 5. Support the aesthetic, architecture, and urban identity.
COMPETENCIES OF ARCHITECTURAL ENGINEERING	B1. Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**LO 6**. Explain concepts, ideas of design, construction, and materials of earlier architecture.
		LO 7. Identify the different architectural features of each period.
		LO8. Sketch buildings from different civilizations.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The course includes the study of the timeline of evolution of architectural styles through studying the differentperiods of the followings; Prehistoric architecture, Egyptian, Greek & Roman architecture, In addition to; earlyChristian architecture, Byzantine architecture and Islamic architecture. The student should be able to learn and draw different architectural features of each period.

5.2. Course Topics/ hours/ Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs.*			**LOs Covered by Course**
			Lec	**Tut**	**Lab**	
Week-1	Introduction of History of Architecture	2	2	0	0	**LO 3-LO 5**
Week-2	Prehistoric Architecture. Definitions, characteristic, feature, and Examples.	2	2	0	0	**LO1: LO8**
Week-3	Egyptian Architecture Definitions, characteristic, feature, and Examples.	2	2	0	0	**LO1: LO8**
Week-4	**Quiz (1)**					
Week5	Greek Architecture. Definitions, characteristic, feature, and Examples.	2	2	0	0	**LO1: LO8**
Week-6	Roman Architecture. Definitions, characteristic, feature, and Examples.	2	2	0	0	**LO1: LO8**
Week-7	**Midterm Exam.**					
Week-8	Early Christian Architecture. Definitions, characteristic, feature, and Examples.	2	2	0	0	**LO1: LO8**
Week-9	Byzantine Architecture. Definitions, characteristic, feature, and Examples.	2	2	0	0	**LO1: LO8**
Week-10	**Quiz (2)**					
Week-11	Islamic Architecture in the world. Definitions, characteristic, feature, and Examples.	2	2	0	0	**LO1: LO8**
Week-12	Islamic Architecture In Egypt. Definitions, characteristic, feature, and Examples.	2	2	0	0	**LO1: LO8**
Week-13	General comparative Revision	2	2	0	0	**LO2-LO4-LO7**
Week14	Final Project	2	2	0	0	**LO1: LO8**
Week15	**FinalExam.**					

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO1			√		√	√	√	√
CLO2	√			√	√			
CLO3	√				√			
CLO4	√	√				√	√	
CLO5				√				

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs) Architecture Engineering							
	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
Face-to-Face Lecture	√	√	√	√	√	√	√	
Online Education	-	-	-	-	-	-	-	-
Tutorial/Exercise								√
Group Discussion	√	√	√	√	√	√	√	
Laboratory	-	-	-	-	-	-	-	-
Site Visit	-	-	-	-	-	-	-	-
Presentation	√	√	√	√	√	√	√	
Mini Project								√
Research and Reporting	-	-	-	-	-	-	-	-
Brainstorming	√	√		√		√		
Self-Learning	√	√	√	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)							
	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
Written Exam	√	√	√	√	√	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√		√		√	√		√
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	-	-	-	-	-
Research Assignment	√	√	√	√		√	√	
Reporting Assignment	√	√	√	√		√	√	
Project Assignment	-	-	-	-	-	-	-	-
In-Class Questions	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	ExamTime
Final Exam(*written*)	**40**	15th	90 min.
Midterm written Exam	**20**	7th	60 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment	**30**	weekly	---
Quizzes/reports/presentation	**10**	4th, 10th	60 min
Total Mark	**100**		

9-FacilitiesRequired:

A-Whiteboard.
B-Projector.
C-Computer.

10- ListofReferences:

10.1. CourseNotes:

- Lecture notes pdf files on Microsoft Teams

10.2. Required Textbooks and Additional References:

- A History of Architecture and Trade. (2018). United States: Taylor & Francis.
- Tuthill, L. C. (2016). History of Architecture: From the Earliest Times, Its Present Condition in Europe and the United States; With a Biography of Eminent Architects, and a Glossary of Architectural Terms (Classic Reprint). United States: Fb&c Limited.
- Watkin, D. (2005). A history of Western architecture. London: Laurence King Publishing.

10.3. Recommended Books:

- Fletcher, B., Palmes, J. C. (1975). Sir Banister Fletcher's A History of Architecture. United Kingdom: Charles Scribner's Sons.
- Freeman, E. A. (1849). A History of Architecture. United Kingdom: J. Masters.
- توفيق عبد الجواد(1969) تاريخ العمارة – جزآن.

10.4. Web Sites: www.ekb.eg

Course Directors	Name	Signature
Teaching staff	**Dr. Omnia Monir**	
Course coordinator	**Dr. Omnia Monir**	
Program coordinator	**Dr. Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Esam Sayid Farag Khalifa**	
Date of approval		

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 115 : Perspective & Sciagraphy

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Perspective & Sciagraphy			**Course Code:**		ARE 115	
Program / level	Architectural Engineering			**sophomore**			
Term/ Academic year:	Oct.- Jan 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	0	**Tutorial:**	4	**Laboratories:**	0
Pre-Requisite	————						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- A Study of shades & shadows of points, parallel or one vanishing point, line, circle, mass (cylinder / sphere) and their architectural applications.
- A study of picture planes: the vanishing point, parallel or one vanishing point perspective, the cone of vision, shades, and shadows in perspective.
- Developing the student's skills to understanding the Shade, Shadows and Perspective Drawings for simple and complex shapes and mass
- The ability drawing the Shade, Shadows and Perspective for architectural models.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1.	Drawing the shade and shadow of architectural vocabulary
CLO 2.	Drawing the shade and shadow of layout, elevations, and plans for simple and complex buildings.
CLO 3.	Drawing the two-point Perspective.
CLO 4.	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ChE
Program Academic Standards that the course contributes in achieving	A5, A9, A10	B2

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.5. Practice research techniques and methods of investigation as an inherent part of learning.	**LO 1.** Define the principles and basics of technical writing standards for scientific research
	A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO 2**. Determine the methods of good formation of architectural elevations.
	A.10. Acquire and apply new knowledge and practice self, lifelong, and other learning strategies.	**LO 3**. Discovered the types of shadows and how to determine their directions. **LO 4**. Determining the different ways to draw an architectural perspective and its types.
COMPETENCIES of ChE	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 5**. Developed external shades to achieve thermal comfort inside buildings. **LO6**. Sketching a good formation, which gives a perspective snapshot that meets the basics of design, and achieves visual comfort

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

A study of picture planes: the vanishing point, parallel or one vanishing point perspective, the cone of vision, the inverse perspective, & shades & shadows in perspective. This under-graduate educational program aims to develop the students skills to understanding the Shade,. Shadows and Perspective Drawings for. simple and complex shapes and mass and then, the undergraduate students will be trained on drawing the Shade, Shadows and Perspective for architectural models.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	Definition of matter, types of lighting and types of shadows.	2	0	4	0	**LO1 LO3**
Week-2	The basic principles of shadow drawing, point shadow, line shadow.	2	0	4	0	**LO2 LO3**
Week-3	Shadow of the plane, shadow of the circle.	2	0	4	0	**LO2 LO3**
Week-4	Applications on the shadow of the plane and the shadow of volumes.	2	0	4	0	**LO3 LO5**
Week5	**Quiz 1**					
Week-6	Various applications on architectural projections (elevations and plans)	2	0	4	0	**LO3 LO5**
Week-7	Definition of engineering perspective, basic definitions and concepts, characteristics, and advantages of engineering perspective.	2	0	4	0	**LO1 LO4**
Week-8	**Midterm Exam.**					
Week-9	Draw perspective with two vanishing points.	2	0	4	0	**LO4**
Week-10	Draw blocks perspective and focus on stairs and slopes.	2	0	4	0	**LO4**
Week-11	**Quiz 2**					
Week-12	Perspective drawing of blocks and making openings such as doors and windows.	2	0	4	0	**LO4 LO6**

Week-13	General exercises on perspective	2	0	4	0	**LO2 LO6**
Week-14	General Review	2	0	4	0	**LO5 LO6**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st		
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
CLO 1	√	√	√		√	
CLO 2	√			√		√
CLO 3			√	√		
CLO 4		√			√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs) Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Face-to-Face Lecture		√	√	√	√	√
Online Education	√					
Tutorial/ Exercise	√	√	√	√	√	√
Group Discussion	–	–	–	–	–	–
Laboratory	–	–	–	–	–	–
Site Visit	–	–	–	–	–	–
Presentation	√		√			
Mini Project	–	–	–	–	–	–
Research and Reporting	√			√		
Brain Storming			√	√		
Self-Learning		√			√	√

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)					
	Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Written Exam	√	√	√	√	√	√
Online Exam	–	–	–	–	–	–
Oral Exam	–	–	–	–	–	–
Quiz	√	√	√	√	√	√
Lab Exam	–	–	–	–	–	–
Take-Home Exam	–	–	–	–	–	–
Research Assignment	√			√		
Reporting Assignment	–	–	–	–	–	–
Project Assignment	–	–	–	–	–	–
In-Class Questions	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	–	–	–
End of term Oral exam	–	–	–
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- د. وليد عبد المنعم، محاضرات مادة الظل والظلال، 2006/2005م.

10.2. Required Text Books and Additional References:

- م. فواز القضاة، الظل والمنظور الهندسي، دار مجدلاوي للنشر والتوزيع، عمان، الأردن، 2000م.

10.3. Recommended Books:

- م. عبد الرحمن محمد نصار، الظلال الظل والمنظور، دار تكنو برنت للطباعة، 1425 هـ.
- أ.د. زكية حسن الشافعي، الظل والظلال، أسلوب الإظهار بقوانين علمية، 1997م.
- أ.د. زكية حسن الشافعي، المنظور الهندسي، 1997م.
- Mc Goodwin, Henry, Architectural Shades and Shadows, American Institute of Architects press, 1991.

Course Directors	Name	Signature
Teaching staff	Dr. Bassem Mohamed EL-sayed Kandel	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct.- Jan 2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 121 : Elements of Architectural Design

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Elements of Architectural Design			**Course Code:**		ARE 121	
Program / level	Architectural Engineering			**sophomore**			
Term/ Academic year:	Oct - Jan. 2023 - 2024			**Credit Hours:**		3	
Contact Hours:	6	**Lecture:**	0	**Tutorial:**	6	**Laboratories:**	0
Pre-Requisite	ARE 111						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Identify functional elements, public, private, service elements, circulation elements, horizontal & vertical.
- develop, material & geometric continuity, linear elements & surface elements
- Analyze Design elements, space, form, and functional elements.
- Design and develop through study model technique.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1.	identify data for the project program, space requirements, and zoning.
CLO 2.	Analysis of case studies and similar projects.
CLO 3.	explain site analysis, urban context, and environmental aspects.
CLO 4.	develop building form, massing, material, and articulation

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ChE
Program Academic Standards that the course contributes in achieving	A2,A6,A7,A8	B1,B2

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.2. 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.	**LO 1.** Analyze similar models to the selected project in terms of the design idea, spaces, functional relationships, climate, and surrounding environment. etc
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO 2**. Explain Site analysis for the selected project and the climatic, social and topographic conditions of the area
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 3.** Apply technical writing standards for scientific research.
	A.8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**LO4.** Develop innovation, cooperation and integration among team members **LO 5.** identify tasks according to the different competencies of members of the same team

COMPETENCIES of ChE	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**LO 6.** choose the design idea that suits the selected project. **LO7.** create different alternatives to the design, compare them, and choose the best **LO8**. integrate his previous knowledge of different architectural trends and schools into the chosen design
	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO7.** create different alternatives to the design, compare them, and choose the best **LO 9**. design the general site of the project in accordance with the climatic conditions and the functional relationships between the project elements.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

This course is the first course of dealing with design problems for single use buildings the student should be introduced to; Functional logic: manipulation of human environment, functional elements, public, private, service elements, and circulation elements, horizontal & vertical. Structural logic: development, material & geometric continuity, linear elements & surface elements. Design elements, space and form, functional elements, Module, material & geometric continuity. Design developed through study model technique. Examples of projects in this course include: residential units, fire station, kindergarten, restaurant or coffee shop. Two projects are recommended in this course.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction of the project and identification of Elements of the project	3	0	6	0	**LO1, LO2**
Week-2	Explain the Concept and its types, and site analysis	3	0	6	0	**LO3, LO4, LO5**

Week-3	Various studies of the project (Zoning - Relationships - Spaces...etc) +Presentation of the final search	3	0	6	0	**LO1, LO2**
Week-4	layout drawing + Mass model ideas First sketches of the plan	3	0	6	0	**LO6, LO7, LO9.**
Week5	Quiz (1)	3	0	6	0	**LO7, LO8**
Week-6	Develop the ground plan and feedback.	3	0	6	0	**LO6, LO7, LO8**
Week-7	Develop the design of plans. + Develop Maquette.	3	0	6	0	**LO6, LO7, LO8**
Week-8	**Midterm Exam.**					
Week-9	Review of all plans, and the beginning of the different elevations design	3	0	6	0	**LO6, LO7, LO8**
Week-10	Review of all plans, and the different elevations and layout. and start the sections design.	3	0	6	0	**LO6, LO7, LO8, LO9**
Week-11	Develop sections design and feedback. +Maquette	3	0	6	0	**LO7, LO8**
Week-12	Review of all drawings ,sections, elevations+ shots +Maquette	3	0	6	0	**LO6, LO7, LO8, LO9**
Week-13	final project	3	0	6	0	**LO6, LO7, LO8, LO9**
Week-14	Revision	3	0	6	0	**LO6, LO7, LO8, LO9**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st		
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO 4	LO5	LO6	LO 7	LO 8	LO9
CLO 1	√	√	–	–	√	√	√	√	–
CLO 2	√	√	–	–	–	√	√	√	–

CLO 3	–	–	√	√	–	–	–	–	√
CLO 4	–	–	√	√	√	–	–	–	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	Learning Outcomes (LOs)								
	Architectural Engineering								
	LO 1	LO 2	LO 3	LO 4	LO5	LO6	LO 7	LO 8	LO 9
Face-to-Face Lecture	√	√	√	√	√	√	√	√	√
Online Education	–	–	–	–	–	–	–	–	–
Tutorial/ Exercise	√	–	√	√	√	√	–	–	√
Group Discussion	√	√	–	√	√	–	–	–	–
Laboratory	–	–	–	–	–	–	–	–	–
Site Visit		√	–	–	–	–	–	–	–
Presentation	√	√	√	√	√	√	√	√	√
Mini Project	–	–	–	–	–	–	√	√	–
Research and Reporting	√	√	√	√	√	–	–	√	–
Brain Storming	–	–	–	–	–	–	√	√	–
Self-Learning	–	–	-	√	√	-	–	–	-

8- Assessment

8.1. Course Assessment Methods:

Course Learning Objectives	Learning Outcomes (LOs)								
	Architectural Engineering								
	LO 1	LO 2	LO 3	LO 4	LO5	LO6	LO 7	LO 8	LO9
Written Exam	√	√	√	–	–	√	√	√	√
Online Exam	–	–	–	–	–	–	–	–	–
Oral Exam	–	–	–	–	–	–	–	–	–
Quiz	√	√	√	–	–	–	√	–	√
Lab Exam	–	–	–	–	–	–	–	–	–
Take-Home Exam	–	–	–	–	–	–	–	–	–

Research Assignment	√	–	√	√	√	–	–	√	–
Reporting Assignment	√	–	–	√	√	√	–	–	–
Project Assignment	√	√	√	–	–	√	√	√	√
In-Class Questions	√	–	√	√	√	–	–	–	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**–**	**–**	**–**
End of term Oral exam	**–**	**–**	**–**
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- CHING, Francis DK. *Architecture: Form, space, and order*. John Wiley & Sons, 2023.
- PRESSMAN, Andy (ed.). *Architectural graphic standards*. John Wiley & Sons, 2007.
- KIM, Jung Soo; GARLAN, David. Analyzing architectural styles. *Journal of Systems and Software*, 2010.
- Neufert, E., Architect's Data,fourth edition , 2012.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.

10.2. Required Text Books and Additional References:

- CHING, Francis DK. *Architecture: Form, space, and order*. John Wiley & Sons, 2023.

10.3. Recommended Books:

- محمود حسن عبد الرجال; محمد. نحو منهجية علمية متقدمة لاستخدام تقنية الذكاء الاصطناعي في استوديوهات التصميم المعماري (تطبيق عملي بمشاركة طلاب العمارة) .*مجلة العمارة والفنون والعلوم الإنسانية* .2023 ,.
- طارق فاروق أبو عوف، كتاب المبدأ التصميمي (DESIGN CONCEPT)، 2015م
- يوسف; ديانا. تأثير التباين على عناصر التصميم الداخلي .*مجلة جامعة مصر للدراسات الإنسانية*.260-235 :1.2 ,2021 ,

Course Directors	**Name**	**Signature**
Teaching staff	Dr. Maysa selim	
Course coordinator	Dr. Maysa selim	
Program coordinator	Dr. Mohamed Nabil el sebai	
Head of the Department	Prof. Esam Khalifa	
Date of approval	Oct - Jan 2023-2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 122: Building Construction & Materials (B)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Building Construction &Materials (B)			**Course Code:**		ARE 122	
Program /level	Architectural Engineering			**Sophomore**			
Term/ Academic year:	Oct.- Jan 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	4
Pre-Requisite	ARE 112						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Demonstrate knowledge and understanding of construction phases
- Understand and Develop architectural details and finishing.
- Apply professional knowledge covering building's Architectural elements.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1. Recognize all components of building construction.

CLO 2. Following engineering standards and act professionally.

CLO 3. integrating comprehensive construction knowledge and skills

3- ***Relationship between the course and the Competencies :***

Field	National Academic Reference Standard(NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A4, A10	B5

4- ***Mapping Course Los to NARS***

Field	Programthat the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 1.** Discover knowledge of building details **LO 2.** Recognize more detailed drawings of the building‘s parts. **LO 3**. Differentiate between structural and non-structural building components.
	A.10. Acquire and apply new knowledge and practice self, lifelong, and other learning strategies.	**LO 4.** Collect the information and engage in life-long self-learning discipline.
COMPETENCIES of ARCHITECCTURAL ENGINEERING	B.5 Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect’s role in the processes of bidding, procurement of architectural services and building production.	**LO 5.** Creating the construction drawings. **LO 6.** Design appropriate details for various constructional cases **LO 7.** Analyze the relationships of structure, building materials, and construction elements into the design process

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Skelton construction, reinforced concrete details and systems, ceilings structure systems, light weight structure systems ; Concrete: mixing water, types of mix design, & properties of wet & hardened Concrete. Special types, quality control, influencing factors, & effects of varying mix proportions. Prefabricated units, fiber glass reinforcement. Insulation materials, joints,& details of constructional element. Analysis of building construction methods.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	Total Hours	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week-1	Materials' symbols used in construction / the various architectural lines / the way of filling in the data on the drawings. **Foundations** -Kinds of foundations. + research Surface foundations (strip foundation spread foundation – meet foundation –mat and drawing of each kind). Deep foundation (alexandrine wells – stakes – caissons – stake curtains).	4	0	0	4	**LO1, LO 3, LO 7**
Week-2	**Pre-fabrication** (pre-fabrication theory – countries' experiments in this field). -Pre-fabricated skeleton construction for small repeated spares. - Bearing wall concrete. - Boxy construction. 1- Pre-fabrication for moderate spares. Pre-fabricated sections' drawing.	4	0	0	4	**LO1, LO 3**
Week-3	**Stairs** - Kinds of stairs according to their design (straight stairs of one conversion – stairs of two conversions without stair wells – stairs of two and three conversions – spiral stairs – circular stairs). - The stairs areas and calculation. - Methods of drawing the stairs.	4	0	0	4	**LO 2, LO 4**
Week-4	- Kinds of stairs in accordance with manufactured material (stony – mosaic – concrete covered with mosaic)+ research - Concrete stair covered with wood – ordinary and spare irony stairs. - Hand rails in all types (bricks concrete – iron – wood – aluminum).	4	0	0	4	**LO 2, LO5, LO 6**

Week5	**Quiz**	4	0	0	4	**LO1,LO3, LO6**
Week-6	**Carpentry Works** **A- Doors' frames** Technical terms, the way of fixing the frame, frame components and frame drawing for the walls of thickness 0.25 m, 0.12 m.	4	0	0	4	**LO 5, LO 6**
Week-7	**B- Doors** Wooden covering door – packet wrapping door – wrapping door with beech crusher. **C- Windows** : (glassy windows)	4	0	0	4	**LO 4, LO5, LO 6**
Week-8	**Midterm Exam.**					
Week-9	**Finishing :** A- Insulation (moisture – heat) : Drawing of real plan insulator – insulation – insulation in the ground and platform – insulation of bathroom's ground. B- Plastering works : Its components – kinds – its execution conditions – of its measurement.	4	0	0	4	**LO3, LO 5**
Week-10	**C-** Separators of expansion and descending. Drawing of expansion and descending in continuous floor in the basement – repeated floor – final surface and repeated surface. D- Painting works Its kinds – conditions of its execution – way of measurement – paintings' stages.	4	0	0	4	**LO 1, LO 4, LO7**
Week-11	E- Exernal Finishing Its kinds – conditions of its execution	4	0	0	4	**LO 5, LO 6**
Week-12	**Project-** follow up	4	0	0	4	**LO5, LO 6, LO 7**
Week-13	Final project	4	0	0	4	**LO5, LO 6, LO 7**
Week-14	Revision.	4	0	0	4	**LO2, LO 6, LO 7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	------
2nd	----------	------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)						
	LO1	LO2	LO3	LOs4	LO5	LO6	LO7
CLO 1	√	√	√	√	-	√	√
CLO 2	-	-	-	-	√	√	
CLO 3	√	√	√	-	√	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	Architectural Engineering						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Face-to-Face Lecture	√	-	√	-	-	-	√
Online Education	-	-	-	-	-	-	-
Tutorial/ Exercise	-	√	-	√	√	√	-
Group Discussion	-	√	-	√	√	√	-
Laboratory	-	-	-	-	-	-	-
Site Visit	-	-	-	√	-	-	-
Presentation	√	-	√	√	√	√	√
Mini Project	-	√	√	-	√	√	
Research and Reporting	√	√	√	√	-	-	√
Brain Storming	-	-	-	-	-	-	√
Self-Learning	-	-	√	√	√	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Written Exam	√	√	√	-	√	√	√
Online Exam	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-
Quiz	√	-	√	-	-	√	-
Lab Exam	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	-	-	-	-
Research Assignment	√	√	√	√	√	√	√
Reporting Assignment	√	√		√	√	√	√
Project Assignment		√			√	√	
In-Class Questions	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	-	---
End of term Oral exam	**-**	-	---
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- د. فاروق عباس حيدر، الموسوعة الحديثة في تشييد المباني، الجزء الثاني، منشأه المعارف بالإسكندرية ،2009
- د. محمد عبد الله، انشاء المباني تكنولوجيا البناء، مكتبه الانجلو المصرية.
- د.اسامه النحاس، الانشاء المعماري، مكتبه الانجلو المصرية، 2007

10.3. Recommended Books:

- Francis D.K.Ching, Building Construction Illustrated, fourth edition, John Wiley & sons inc, 2008

10.4. Web Sites:

Course Directors	Name	Signature
Teaching staff	Dr. Alaa-eldeen abdelrahman	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct.- Jan 2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 124 : Theory of Structure (A)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Theory of Structure (A)			**Course Code:**		ARE 124	
Program / level	Architectural Engineering			**Sophomore**			
Term/ Academic year:	oct -Jan 2023 – 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	0
Pre-Requisite	----						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Understanding the different types of structures (Beams, Frames, Arches and Trusses)
- Learning the calculation of the internal forces in different types of civil structures
- Understanding the types of loads, supports and equilibrium equations.
- The student will have through this course the basic information and tools through which, they will be able to analyze several types statically determined structural systems
- Also , after this courses , they will be able to study more advanced courses of structural analysis

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Select the appropriate structural system for different civil and architectural works

CLO 2. Calculate the reactions in beams, girders, frames, arches and trusses

CLO 3. Determine the stability and determinacy of different structures

CLO 4. Find the internal forces in different types of beams and frames

CLO 5. Analysis the different types of arches and trusses by different methods

CLO 6. Draw the internal forces diagrams for the different structures

3- Relationship between the course and the Competencies:

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARC
Program Academic Standards that the course contributes in achieving	A1,A2,A7	B3

3- ***Mapping Course Los to NARS***

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
	A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**LO 1.** Identify structural analysis and structural design
	A.2. 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	**LO 2.** Define different types of structures, loads, supports, condition of static stability and condition equations **LO 3.** Calculate the reactions in beams, girders, frames, arches and trusses **LO 4.** Find the internal forces in different types of beams, frames and draw the internal forces diagrams for the different structures

COMPETENCIES of ENGINEERING GRADUATE	**A.7.** Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 5.** Study the stability and determinacy of structures and finding internal forces in inclined beams and broken beams
COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B3.** .Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.	**LO** 6**.** Select the appropriate structural system and materialfor different civil and architectural works

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Reactions internal actions in statically determinable beams & cantilever beam, internal action in statically determinable frames & statically determinable trusses. Properties of plane areas, members under axial forces, normal stresses, shear stresses & combined stresses. This course introduces the students the first principles of the theory of structures, the different types of structures and the methods of analysis of each type. Also, It introduces the students the different types of stresses.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction to structuralanalysis	2	1	2	0	**LO 1**
Week-2	Types of structures, loadsand supports	2	1	2	0	**LO 2**, **LO 7**
Week-3	Condition of static stability and condition equations	2	1	2	0	**LO 5**, **LO 8**
Week-4	**Quiz 1**					
Week5	Calculation of reactions inbeams	2	1	2	0	**LO 2**, **LO 3**
Week-6	Calculation of reactions inframes and in trusses	2	1	2	0	**LO 3**, **LO 8**
Week-7	Stability and determinacy ofstructures	2	1	2	0	**LO 5**
Week-8	**Midterm Exam.**					

Week-9	Internal forces in cantilevers beams, simple beams,overhanging beams and compound beams	2	1	2	0	**LO 4**, **LO 5**
Week-10	**Quiz 2**					
Week-11	Internal forces in inclinedbeams and broken beams	2	1	2	0	**LO 4**
Week-12	Internal forces in simple frames, compound framesand arches	2	1	2	0	**LO 4, LO 6**
Week-13	Methods of analysis oftrusses	2	1	2	0	**LO 4, LO 6**
Week-14	**Revision.**					
Week 15	**Final Exam.**					

5.1. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	---------	----
2nd	---------	----

Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO 1	√	√					√	√
CLO 2		√	√		√			√
CLO 3					√		√	√
CLO 4			√	√	√			
CLO 5			√		√	√		√
CLO 6			√	√	√	√		

6- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs) Architectural Engineering							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√	√	√	√	√	√	√	√
Online Education	--	--	--	--	--	--	--	--
Tutorial/ Exercise	√	√	√	√	√	√	√	√
Group Discussion		√					√	
Laboratory	--	--	--	--	--	--	--	--
Site Visit	--	--	--	--	--	--	--	--
Presentation			√	√	√		√	
Mini Project								
Research and Reporting	√	√						
Brain Storming	√	√					√	√
Self-Learning	--	--	--	--	--	--	--	--

7- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√	√	√	√	√	√
Online Exam	--	--	--	--	--	--	--	--
Oral Exam	--	--	--	--	--	--	--	--
Quiz		√	√	√	√			
Lab Exam	--	--	--	--	--	--	--	--
Take-Home Exam	--	--	--	--	--	--	--	--
Research Assignment		√	√	√	√			
Reporting Assignment	√	√	√			√	√	√
Project Assignment			√	√	√			
In-Class Questions	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	-	---
End of term Oral exam	**-**	-	---
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Projector.
B- Computer.
C- White board

6- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Structural analysis and mechanics

10.3. Recommended Books:

- THEORY OF STRUCTURES (VOL 1) Paperback – 1 July 2017, Edition
- 1st, Publisher,McGraw Hill Education, ISBN-13 ,978-00746349
- Structural analysis for engineers / Nicholas Willems, William M. Lucas, Jr,2015 published,New York : McGraw-Hill, [1978].
- Sayed Abd El-Salam,2015 "Theory of Structures Part I and II

10.4. Web Sites:

Course Directors	Name	Signature
Teaching staff	Dr. Mahmoud Mohamed Abd Alhamed	
Course coordinator	Dr. Mohamed Nabil El Sebai	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	Prof. Essan Said Farag Khalifa	
Date of approval	Oct -Jan (2023 – 2024)	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 125: Theories of Architecture (A)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Theories of Architecture(A)			**Course Code:**		**ARE 125**	
Program /Level	Architectural Engineering			Sophomore year			
Term/ Academic year:	Oct.-Jan 2023 – 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	0
Pre-Requisite	ARE 114						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Identify the difference between the history and theories of architecture.
- Explain the most important trends and artistic methods from the fourteenth century to the twentieth century.
- Analyze the distinctive architectural features of each era.

2- Course Learning Objectives (CLO):

At the end of this course, students should be able to:

CLO 1.Compare between history and theories of architecture.

CLO 2.Analyze characteristics of the building construction period (the era in which it was built) through its features and elements.

CLO 3. Explain the social movement's impact on the architectural trend followed in each era.

CLO 4.Analyze the building and access its elements.

CLO 5. Explain the impact of the emergence of modern construction materials on the construction style and the final form of the architectural product.

CLO 6. Identify the building as a living organism affected by the variables surrounding it.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARCHITECCTURAL ENGINEERING
Program Academic Standards that the course contributes to achieving	A5,A6,A8	B1,B2

4- ***Mapping Course Los to NARS***

Field	The program that the course contributes to achieving	Learning Outcomes (LOs)
COMPETENCIES of ENGINEERING	A.5. Practice research techniques and methods of investigation as an inherent part of learning.	LO 1: Define architecture and theories of architecture LO 2: Explain the difference between history and theory. LO 3: Analyze the characteristics of the building in different eras familiarize the distinctive features of each era.
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO 4: Analyze the building and explains its distinctive features LO 5: Explain the impact of social movement on each architectural era.

		LO 6: Conclude the specific era of each building through the distinctive features of the building. LO 7: Identify building materials' effect on the shape and product for each era.
	A.8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO 5: Explain the impact of social movement on each architectural era. LO 8: Develop ability to work in groups.
COMPETENCIES of ARCHITECCTURAL ENGINEERING	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	LO 1: Define architecture and theories of architecture LO 5: Explain the impact of social movement on each architectural era.
	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	LO 4: Analyzes the building and explains its distinctive features . LO 6: Conclude the specific era of each building through the distinctive features of the building.

5- Course Content:

5.1. Course Description (As indicated in the program Bylaw):

Theories of architecture: roots of contemporary architecture Revivalism: romantic, classicism, revolutionary architects in France, development in France, England, U.S.A, & Germany. Gothic Revival; England, Germany & U.S.A. picturesque, Renaissance, revival, Eclecticism, philosophy, 2 Empire France, U.S.A, higher Victorian. Structural logic; development of iron & reinforced concrete, writing of violet le Due & Chicago School. Formal development: Effect of Art, Cubism, purism, Still & picturesque tendencies.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	General introduction to the course contents. Definitions of architecture and	2	1	2	0	**LOs 1, LOs 2**

	theories of architecture. The differencebetween the history and theories of architecture.					
Week-2	Renaissance (Early Renaissance): Reviewing the buildings of the early Renaissance era and clarifying the distinctive features of the architecture of this era present in the buildings.	2	1	2	0	**LOs 3, LOs 4, LOs 5, LOs 6, LOs 7**
Week-3	Renaissance (High Renaissance): Reviewing the buildings of the High Renaissance era and clarifying the distinctive features of the architecture of this era present in the buildings.	2	1	2	0	**LOs 3, LOs 4, LOs 5, LOs 6, LOs 7**
Week-4	Renaissance (Late Renaissance): Reviewing the buildings of the early Renaissance era and clarifying the distinctive features of the architecture of this era present in the buildings	2	1	2	0	**LOs 3, LOs 4, LOs 5, LOs 6, LOs 7**
Week-5	**Quiz 1**					
Week-6	Renaissance and Baroque style: Reviewing the art and sculpture work clarify and define the features					**LOs 3, LOs 4, LOs 5, LOs 6, LOs 7**
Week-7	**Midterm Exam.**					
Week-8	ROCOCO: Reviewing the buildings and clarifying the distinctive features of the architecture of this era present in the buildings.	2	1	2	0	**LOs 3, LOs 7**
Week-9	Comparison between the three styles	2	1	2	0	**LOs 3, LOs 7**
Week-10	18th& 19thCentury architecture and the revival architecture	2	1	2	0	**LOs 3, LOs 4, LOs 5, LOs 6, LOs 7**
Week-11	explain the revival architecture in detail by reviewing the buildings of revival and clarifying the distinctive features of the architecture of this era present in the buildings.	2	1	2	0	**LOs 3, LOs 4, LOs 5, LOs 6, LOs 7**

Week-12	explain Innovative Architecture in detail	2	1	2	0	**LOs 3, LOs 4, LOs 5, LOs 6, LOs 7**
Week-13	**Final project**	2	1	2	0	**LOs 3, LOs 4, LOs 5, LOs 6, LOs 7**
Week-14	**General Revision**	2	1	2	0	**LOs 1, LOs 2, LOs 3, LOs 4, LOs 5, LOs 6, LOs 7, LOs 8**
Week 15	**Final Exam.**					

6- Matrix of Course Objective and LOs

Course Learning Objectives	**Learning Outcomes (LOs)**							
	LO 1	**LO 2**	**LO 3**	**LO 4**	**LO 5**	**LO 6**	**LO 7**	**LO 8**
CLO 1	√	√	--	--	√	√	--	--
CLO 2	--	--	√	√	--	√	--	--
CLO 3	--	√	--	--	√	--	√	--
CLO 4	√	--	--	√	√	--	--	√
CLO 5	--	--	√	--	--	--	√	--
CLO 6	--	√	--	√	√	√	√	--

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome* (LOs)							
	Architectural Engineering							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√	√	√	√	√	√	√	√
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	-	-	√	√	√	-	√	√
Group Discussion	√	√	√	√	√	√	√	√
Laboratory	-	-	-	-	-	-	-	-
Site Visit	-	-	√	-	-	-	-	-
Presentation	√	√	√	√	√	√	√	-
Mini Project	-	-	√	√	√	√	√	√
Research and Reporting	√	√	√	√	√	√	√	√
Brain Storming	-	√	√	√	√	√	√	-
Self-Learning	-	-	-	-	-	-	-	√

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√	√	√	√	√	-
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√	√	√	√	√	√	√	-
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	-	-	-	-	-
Research Assignment	√	√	√	√	√	√	√	-
Reporting Assignment	√	√	√	√	√	√	√	-
Project Assignment	√	√	√	√	√	√	√	√
In-Class Questions	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*written*)	**20**	7th	60 min.
Tutorial and report assessment (*Term Work*)	**25**	weekly	-
Quizzes/reports/presentation (*Final project - Term Work*)	**15**	According to the schedule	-
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- **Lecture notes**

10.2. Required Text Books and Additional References:

- اسماعيل; احمد يحيي. دراسة طرز التراث المعماري كمدخل لتطوير التفكير الابداعي بأقسام العمارة .*مجلة العمارة والفنون والعلوم الإنسانية*.53-23 :7.35 ,2022
- نور الدين .et al ,تطور تناول التراث في العمارة والتصميم الداخلي المعاصر من القرن الثامن عشر الي القرن العشرين .*مجلة العمارة والفنون والعلوم الإنسانية*.2023
-
- ألفت يحيى حمودة ,نظريات وقيم الجمال المعماري , دار المعارف – القاهرة. 1981 ,
- على رأفت , ثلاثية الإبداع المعماري : الابداع الفني في العمارة , مركز أبحاث انتر كونسلت – القاهرة. 1997 ,

10.3. Recommended Books:

- Smith, Korydon, and Miguel Guitart. Introducing architectural theory: debating a discipline. Routledge, 2013.
- MALLGRAVE, Harry Francis. Architectural theory. 2006.
- DAVIES, Colin. Thinking about architecture: An introduction to architectural theory. Hachette UK, 2011.
- KRUFT, Hanno-Walter. History of architectural theory. Princeton Architectural Press, 1994.
- Neemat Ismael Alaam, Western Arts in the Middle Ages, Renaissance Age, and Baroque, Dar El-Maaref, Cairo, 1982.
- Neemat Ismael Alaam, Modern Ages, Dar El-Maaref, Cairo, 1982.

Course Directors	Name	Signature
Teaching staff	**Dr. Maysa selim**	
Course coordinator	**Dr. Maysa selim**	
Program Coordinator	Dr. Mohamed Nabil El sebai	
Head of the Department	Prof. Esam Khalifa	
Date of approval	**Oct.-Jan 2023 – 2024**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 141: Architectural Design of Simple Units

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Architectural Design of Simple Units			**Course Code:**		**ARE 141**	
Program/ Level	Architectural Engineering			**Junior year**			
Term/ Academic year:	Oct.-Jan.2023 - 2024			**Credit Hours:**		3	
Contact Hours:	6	**Lecture:**	0	**Tutorial:**	6	**Laboratories:**	0
Pre-Requisite	ARE121, ARE 123						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Designing an architecture studio for a library requires careful consideration of various factors to create a functional, aesthetically pleasing, and efficient space.
- Understand the unique requirements and challenges of library design.
- Develop a design concept and design proposal for a modern library.
- Apply architectural and interior design principles to create a functional and aesthetically pleasing space.
- Incorporate sustainable design practices into their projects.
- Communicate their design ideas effectively through drawings, models, and presentations.
- Work collaboratively on design projects and critique peers' work constructively.
- Study of the site's content and analysis of site planning elements.
- Study of structural coordination and construction technology.
- Study the relationship between internal and external spaces.
- A study of pedestrian and vehicle traffic paths.
- An introduction to structural expressions in architecture.

- Study daylighting and zone ordination.

2- Course Learning Objectives (CLO):

At the end of this course, students should be able to :

CLO 1. Program analysis and technical studies.

CLO 2. Site planning analysis.

CLO 3. Simple building design elements.

CLO 4. Creative and innovative thinking in solving problems and making designs.

CLO 5. The introduction to structural expressions in architecture.

CLO 6. The daylighting and zone ordination

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard(NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARCHITECTURE
Program Academic Standards that the course contributes to achieving	**A2, A6, A7, A8**	**B1, B2, B3**

4- *Mapping Course Los to NARS*

Field	Program(CBEs) that the course contributes to achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**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: Apply innovative problem-solving in design contexts. LO4: Utilize creative three-dimensional exploration in design concepts. LO6: Select and assess appropriate tools for engineering challenges.
	A.6. Plan, supervise and monitor the implementation of engineering projects, taking into consideration other trades Requirements.	LO7: Execute specialized architectural designs for components and systems. LO9: Apply architectural design principles effectively.

	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	LO2: Synthesize diverse perspectives and knowledge from multiple sources. LO5: Evaluate and merge diverse insights from varied sources.
	A.8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary Tools.	LO3: Engage in lifelong learning by consistently seeking out new information LO4: Utilize creative three-dimensional exploration in design concepts. LO8: Anticipate aesthetics and precision in design approaches.
COMPETENCIES of ARCHITECTURE	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	LO7: Execute specialized architectural designs for components and systems. LO8: Anticipate aesthetics and precision in design approaches. LO9: Apply architectural design principles effectively.
	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	LO1: Apply innovative problem-solving in design contexts. LO3: Engage in lifelong learning by consistently seeking out new information LO9: Apply architectural design principles effectively.
	B.3. Generate ecologically responsible, environmental conservation and rehabilitation designs through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	LO6: Select and assess appropriate tools for engineering challenges. LO9: Apply architectural design principles effectively.

5- Course Content:

5.1. Course Description (As indicated in the program Bylaw):

Introduction to Architecture Design of Simple Design: the course aims to deal with the criteria of context, including the relationship between indoor and outdoor spaces, environmental conditions of the site, and physical and visual analysis, in addition to the study of pedestrian and vehicular circulation.
Projects include a primary school, motel, exhibition hall, office building, residential building, small museum, bank branch, local post office, and community library.

Study of site context and analysis of site planning elements. Study of structural coordination and constructional technology. The student should practice Program analysis, functional studies, design of simple building elements, and site planning analysis—introduction to constructional expression in architecture.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**Los Covered by Course**
			Lec.	**Tut.**	**Lab**	
Week-1	General introduction to the project + research on Design standards for public libraries. Assignment: Project Research	6	0	6	0	LO1, LO2, LO3
Week-2	Site analysis lecture (Building on specific land) Assignment: Site Visit	6	0	6	0	LO1, LO3, LO4, LO5
Week-3	Lecture about Form and modeling. Studying principles of architectural compositions and the relation between masses and spaces. Assignment: Study model	6	0	6	0	LO1, LO9
Week-4	Reviewing - **Quiz**	6	0	6	0	LO1, LO2, LO3, LO4, LO9
Week5	Structure System lecture. Efficiency of circulation and several functional relationships. Assignment: making Maquatte for the Structure system of their model.	6	0	6	0	LO5, LO6, LO7
Week-6	Presentation of the project (First stage) Assignment: Marketing video posted on Social Media for their project	6	0	6	0	LO3, LO8
Week-7	Lecture about project presentation	6	0	6	0	LO8
Week-8	**Midterm Exam.**					
Week-9	Plans reviewing Assignment: Mood Board	6	0	6	0	LO4
Week-10	Layout and Elevations reviewing	6	0	6	0	LO9
Week-11	Sections reviewing	6	0	6	0	LO9
Week-12	Project reviewing	6	0	6	0	LO8

Week-13	Presentation of the project (semi-final)	6	0	6	0	LO4, LO8
Week-14	Presentation of the project (final Submission)	6	0	6	0	LO3, LO4, LO8
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)								
	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9
CLO 1		√					√		
CLO 2	√			√					
CLO 3									√
CLO 4	√			√					
CLO 5						√		√	√
CLO 6			√		√				

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	General				ARE		
	A2	A6	A7	A8	B1	B2	B3
	LO1 , LO4, LO 6	LO7, LO9	LO2, LO5	LO3, LO4, LO8	LO7toLO9	LO1, LO3, LO9	LO6, LO9
Face-to-Face Lecture	√	√		√	√	√	√
Online Education							
Tutorial/ Exercise	√	√	√			√	√
Group Discussion	√		√	√			
Laboratory							
Site Visit			√			√	
Presentation		√	√		√		
Mini Project	√	√		√		√	√
Research and Reporting		√	√			√	√
Brain Storming	√		√				
Self-Learning	√		√	√			

8- Assessment

- Project Research
- Site Visit
- Study model
- Maquette of the structure system
- Project Marketing
- Mood Board
- Home Design Assignment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	General				ARE		
	A2	A6	A7	A8	B1	B2	B3
	LO1 , LO4, LO 6	LO7, LO9	LO2, LO5	LO3, LO4, LO8	LO7toLO9	LO1, LO3, LO9	LO6, LO9
Written Exam	√			√		√	
Online Exam							
Oral Exam							
Quiz		√	√	√	√	√	
Lab Exam							
Take-Home Exam							
Research Assignment		√	√			√	√

Reporting							
Assignment							
Project Assignment	√	√	√	√	√	√	√
In-Class Questions							

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**15**	14th	Committee
Tutorial and report assessment (*Term Work*)	**15**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**10**	4th	120 min.
Total Mark	**100**		

9- Facilities Required:

A- Seminar room, workshop room and drawing studio
B- laptop and Data show for presentation
C- Lecture hall

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Neufert, Ernst, Neufert, Peter. 2012. Neufert Architects' Data, Fourth Edition. Published by Wiley-Blackwell.

10.3. Recommended Books:

- ابوعوف،طارق. 2014. تحليل الموقع. مؤسسة سكاي للكتاب
- ابو عوف،طارق. 2015. المبدأ التصميمي. مؤسسة سكاي للكتاب
- **Campbell, James W.P.** *The Library: A World History.* 2nd ed. London: Thames & Hudson; 2021.
- **McCabe, Gerard B.** *Library Building Projects: Tips for Survival.* Lanham, MD: Rowman & Littlefield; 2020.

- **Buschman, John E. and Leckie, Gloria J.** (Eds.) *The Library as Place: History, Community, and Culture.* 2nd ed. Santa Barbara, CA: Libraries Unlimited; 2019.
- **Worpole, Ken.** *Designing Libraries: Planning and Design of Information Resource Centers.* New York: Routledge; 2018.
- **Pratt, Kenneth W.** *Building Type Basics for Academic Libraries.* Hoboken, NJ: Wiley; 2017.

10.4. Web Sites:

- https://www.fosterandpartners.com/
- http://www.sagradafamilia.org/en/
- https://www.skyscrapercity.com/
- https://www.asla.org/
- http://www.ekb.eg/ar
- http://www.architectmagazine.com/

Course Directors	Name	Signature
Teaching staff	**Dr. Ghada Assal – Dr. Omnia Monir**	
Course coordinator	**Dr. Ghada Assal**	
Program Coordinator	**Dr. Mohamed M. Elsebaay**	
Head of the Department	**Prof. Essam Khalifa**	
Date of approval	Oct.-Jan.2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 142 : Diploma project

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Diploma project			**Course Code:**		ARE 142	
Program / level	Architectural Engineering			**JUNIOR**			
Term/ Academic year:	Oct -Jan 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	0	**Tutorial:**	4	**Laboratories:**	0
Pre-Requisite	ARE 122						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Applying the principals of modeling, architectural design and working drawings.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1.	The ability to integrate between architectural and working drawings and drawing material symbols
CLO 2.	Preparation of the complete executive drawings for layout, plans, elevations, sections, and Structural works, foundation, axes, and slabs.
CLO 3.	understanding the Projects sanitary and electrical works

3- ***Relationship between the course and the Competencies :***		
Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ChE
Program Academic Standards that the course contributes in achieving	A3, A5, A7, A9	B3, B5

4- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 1.** Design executable projects of the highest quality and at the lowest cost.
	A.5. Practice research techniques and methods of investigation as an inherent part of learning.	**LO 2.** Determine the principles and basics of technical writing standards for scientific research.
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 3.** Determine the distribute tasks according to the different competencies of members of the same team
	A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO 4.** Choose the design idea that suits the selected project.
COMPETENCIES of ChE	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 5**. Choose the structural system that suits the architectural project. **LO 6.** Design working drawings for various architectural drawings from a general site, horizontal projections, etc.
	B.5 Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO 7.** Assemble the required drawings for the project in an appropriate form that shows its design idea

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The student selects one of the available projects in the department with the help of academic staff. The fulfillment of the project should prove that the student has enough experience in modeling & architectural design and working drawings.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	**Tut.**	**Lab.**	
Week -1	Definition of the material and clarification of all operational work for similar projects, and drawing of symbols for horizontal projections	2	0	4	0	**LO1, LO2, LO3**
Week-2	Choose the project and start preparing all the architectural drawings	2	0	4	0	**LO4**
Week-3	Completion of architectural plans, and initiation of working drawings for plans.	2	0	4	0	**LO4, LO5**
Week-4	Review the working drawings for plans and drawing all the elevations and it`s symbols.	2	0	4	0	**LO5, LO6**
Week5	Quiz 1	2	0	4	0	**LO7**
Week-6	Review the working drawings for elevations and drawing all sections and it`s symbols.	2	0	4	0	**LO5, LO6**
Week-7	Review of all elevations and sections working drawings.	2	0	4	0	**LO5, LO6**
Week-8	**Midterm Exam.**					
Week-9	Project's sanitary works, and it`s symbols.	2	0	4	0	**LO6**
Week-10	Project's electrical works, and it`s symbols.	2	0	4	0	**LO6**
Week-11	Quiz 2	2	0	4	0	**LO7**
Week-12	Structural works foundations & axes & slabs, and it`s symbols.	2	0	4	0	**LO5, LO6**
Week-13	Project's discussion	2	0	4	0	**LO7**
Week-14	General review	2	0	4	0	**LO7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st		
2nd		

6- Matrix of Course Objective and Los

Course Learning Objectives	Learning Outcomes (LOs)						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
CLO 1	√	√	–	√	–	√	√
CLO 2	–	–	√	–	√	√	√
CLO 3	√	–	–	√	–	√	–

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	Architectural Engineering						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Face-to-Face Lecture	√	√	√	√	√	√	√
Online Education	√	–	–	–	–	–	–
Tutorial/ Exercise	√	√	√	√	√	√	√
Group Discussion	–	–	–	–	–	–	–
Laboratory	–	–	–	–	–	–	–
Site Visit	–	–	–	–	–	–	–
Presentation	√	–	√	–	–	–	√
Mini Project	–	–	–	–	–	–	–
Research and Reporting	√	–	–	√	–	–	–
Brain Storming	–	–	√	√	–	–	–
Self-Learning	–	√	–	–	√	–	√

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	Architectural Engineering						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Written Exam	√	√	√	√	√	√	√
Online Exam	–	–	–	–	–		–
Oral Exam	–	–	–	–	–		–
Quiz	√	√	√	√	√	√	√
Lab Exam	–	–	–	–	–	–	–
Take-Home Exam	–	–	–	–	–	–	–
Research Assignment	√	–	–	–	√	√	–
Reporting Assignment	–	–	–	–	–	–	–
Project Assignment	–	–	–	–	√	–	√
In-Class Questions	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	–	–	–
End of term Oral exam	–	–	–
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- الموسوعة الحديثة في تشييد المباني، د. فاروق عباس حيدر، منشأة المعارف، الإسكندرية، مصر، الطبعة السادسة.

10.2. Required Text Books and Additional References:

- التصميمات التنفيذية، د. هشام حسن على، مكتبة دار المعرفة، القاهرة، مصر، الإصدار الثاني، 2012م.

10.3. Recommended Books:

- Ramsey & Sleeper, Architectural Graphic Standards, The American Institute of Architects, John Wiley & Sons, Inc., New Jersey, U.S.A., 11th Edition, Student Edition: Edited by Bruce Bassler, 2008.
- Francis D. K. Ching, Building Construction Illustrated, John Wiley & Sons, Inc., New Jersey, U.S.A., 4th edition, 2008..

Course Directors	Name	Signature
Teaching staff	Dr. Eman Kandel	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct .- Jan 2023-2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 143: Computer Application in Architecture (1)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Computer Application in Architecture (1)			**Course Code:**		ARE 143	
Program / level	Architectural Engineering			junior			
Term/Academic year:	Oct 23-Jan 2023-2024			**Credit Hours:**		2	
Contact Hours:	**6**	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	6
Pre-Requisite	CS 001						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Enhance communication between individuals and machine in 2d programs
- Use computational facilities, techniques and laboratory in 2d drawings
- Merge knowledge of 2d commands and understanding of architecture drawings.
- Use a wide range of analytical tools and software of 2d during specialized procedures.
- Annovate suitable solutions of architecture drawing problems.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Aware professional of 2d cad programme.

CLO 2. Achieve the interpret result in architectural drawings using specified commands.

CLO 3. Produce drawings in 2d program according to good understanding of 2d software packages of architecture program.

CLO 4. Create 2d drawings of contemporary architectural projects according to professional application of 2d program.

CLO 5. Apply numerical solutions of architecture problems.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARCHITECTURE
Program Academic Standards that the course contributes in achieving	A8,A9	B2

3- *Mapping Course Los to NARS*

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO1. Communicate to contemporary form by applying 2D cad program . LO2. Use contemporary tools in different drawings of architectural projects.
	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3. use creative and flexible thinking in produce 2d drawings

COMPETENCIES of ARCHITECTURAL ENGINEERING	B2. Produce designs that meet building user's requirements through understanding the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces and needs and between them to human scale.	LO4. Generate designs that fulfill the needs of building users . LO5. Recognize the importance of aligning buildings, spaces, and requirements with human scale to enhance overall user needs . LO6. Understand the relationship between people and buildings in 2D drawings LO7. Present the environment, human scale effectively in 2d drawings.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

A general introduction to computer graphics & its application in architectural design & the graphic arts.Practical assignments are included this course introduces the student to AUTOCAD which isthe most powerful2D design and drafting plat form.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	The concept of the digital drawings & the deference between the manual and the digital ways. AUTOCAD terms. AUTOCAD graphical user interface.	6	0	0	6	**LO 1**
Week-2	The rules that control the AUTOCAD program 1-Drawing commands 2-Editing commands 3-Setting commands X,Y Coordinates concept Drawing Units concept Drawing / line command Modify / Erase command DISPLAY / ZOOM / PAN	6	0	0	6	**LO 1**

	ORTHO / OBJECT SNAP / GRID / SNAP *The ABSOLUTE METHOD* RELATIVE METHODS RECTANGULAR (@ X,Y) POLAR (@DISTANCE<ANGLE) Draw / Line / Arc / Circle Modify / Offset / Copy / Move.					
Week-3	Draw / Block / Make / Insert / Poly line / Polygon Modify / Rotate / Fillet / Trim /Mirror /Extend / Explode Draw / Multi line	6	0	0	6	**LO 3**
Week-4	QUIZ NO. 1					
Week5	Object Selection Concept Pick Box / Window / Crossing / Fence / All Draw / Hatch Layer Concept and all related Commands	6	0	0	6	**LO 3, LO 5**
Week-6	Dimensions Concept and Styles Insertion for Files and Dimension styles and Blocks Exchange.	6	0	0	6	**LO 6, LO 7**
Week-7	Query Commands / List / Area / Distance / Id	6	0	0	6	**LO 4, LO 5**
Week-8	**Midterm Exam.**					
Week-9	Multiline and their styles	6	0	0	6	**LO 5, LO 6, LO 7**
Week-10	QUIZ NO. 1					
Week-11	Application on architectural plans	6	0	0	6	**LO 4, LO 5, LO 6 ,Lo7**
Week-12	Final Project Presentation	6	0	0	6	**LO1,LO2,LO3,LO 4, LO 5, LO 6 ,Lo7**
Week-13	Quiz (Hand over Final Project)	6	0	0	6	
Week-14	Revision.	6	0	0	6	

Week 15	**Final Exam.**

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	-----	6
2nd	-----	-----

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
CLO 1	√		√			√	√
CLO 2	√						
CLO 3	√	√					
CLO 4	√		√	√			
CLO 5				√	√	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	ARCHITECURAL ENGINEERING						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Face-to-Face Lecture	√	√	√	√	√	√	√ √
Online Education	--	--	--	--	--	--	-- --
Tutorial/ Exercise	√	√	√	√	√	√	√ √
Group Discussion					√	√	
Laboratory	√	√	√	√	√	√	√
Site Visit	--	--	--	--	--	--	--
Presentation	√			√		√	√
Mini Project	--	--	--	--	--	--	--
Research and Reporting	--	--	--	--	--	--	--
Brain Storming		√	√	√		√	√
Self-Learning	--	--	--	--	√	√	--

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	ARCHITECURAL ENGINEERING						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Written Exam	√	√	√	√	√	√	√
Online Exam	--	--	--	--	--	--	--
Oral Exam	--	--	--	--	--	--	--
Quiz	√	√		√	√	√	
Lab Exam	√	√	√	√	√	√	√ √
Take-Home Exam	--	--	--	--	--	--	--
Research Assignment	--	--	--	--	--	--	--
Reporting Assignment	--	--	--	--	--	--	--

Project Assignment	√	√	√	√	√	√	√
In-Class Questions		√	√	√			

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min..
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Projector.
B- Computer
C- Printer
D- pointer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Any book in Cad 2D in the libarary in the Institute.

10.3. Recommended Books:

- أوامر الأتوكاد –Montzer Adel- اتوكاد 29 – ستمبر 2020
- أساسيات اتوكاد CAD Auto- 2014 اعداد م. أبو بكر أبو زايد- مطبوعات الشركة القابضة للخدمات وألاستشارات الهندسية والتدريب –ديسمبر 2014

- ميكانيكا انتاج- الرسم بمساعدة الحاسب – المملكة العربية السعودية – المؤسسة العامة للتعليم الفنى- الأدارة العامة للتصميم وتطوير المناهج
- أأساسيات اتوكاد 2010 – اعداد المهندس المساعد/ على مهدى مفتن) جامعة النهرين- مدقق اللغة العربية د. نهاد حسوبى صالح) معاون العميد للشؤن أألدارية – كلية أألداب – جامعة بغداد)
- أرسم/ أحسب كميات CAD Auto شرح جميع أألوامر
- –حساب الكميات – خبرة عملية – اعداد المهندس / جورج مواس 2009– • Auto CAD MEP 2010,User`s Guide , by autodesk,sep 2020 .
- Bartolomé" and "López-Lucas.:AutoCad 2023.
- Bartolomé López-Lucas (2015):Autocad 2014
- David Bayerns(2013):Autocad 2013, Dar Al Farouk for Cultural Investments"
- Terence M.Shumaker /David(2017): Auto CAD and its Application COMPREHENSIVE A.Madson /David P.Madson Jeffrey A Larich/J.C Maltzke/Craig P.Black
- CADArtifex(20210:"AutoCAD 2021: A Power Guide for Beginners and Intermediate Users"

Books Links

- https://www.googleadservices.com/pagead/aclk?sa=L&ai=DChcSEwj7uOKC6ZqDAxVElmgJHXYHCSUYABAKGgJ3Zg&ase=2&gclid=CjwKCAiA-P-rBhBEEiwAQEXhHwSmxfuoBL0sxUIlFnRN3Eyex51cSHuZsR_T4K18KRFXTAnnG7ltjhoCzVwQAvD_BwE&ohost=www.google.com&cid=CAESVuD2ckX_Az727HrWjalGelVV2z-X5VIUClVn0zVAna3pnyPCXoQsErpbOl38jvF_7ld6iQlCIRAR4EasP_PGFoF9q2yy4Yn_-LuOASgL_Epi2Zm8c0Ze&sig=AOD64_0mIxJiv7Ez2kEJItaUK1IU5BgXsQ&ctype=5&q=&nis=4&ved=2ahUKEwjEn9uC6ZqDAxVWUaQEHcKUAoYQ9aACKAB6BAgFEC0&adurl=

- https://www.googleadservices.com/pagead/aclk?sa=L&ai=DChcSEwj7uOKC6ZqDAxVElmgJHXYHCSUYABAOGgJ3Zg&ase=2&gclid=CjwKCAiA-P-rBhBEEiwAQEXhH6shf32GizYRx89dcC35I5eR0YrAbleAWIeyl5GTtmz3wiGtkaXBDxoCpEoQAvD_BwE&ohost=www.google.com&cid=CAESVuD2ckX_Az727HrWjalGelVV2z-X5VIUClVn0zVAna3pnyPCXoQsErpbOl38jvF_7ld6iQlCIRAR4EasP_PGFoF9q2yy4Yn_-LuOASgL_Epi2Zm8c0Ze&sig=AOD64_2OieQcprY5RvDruluJqlY8RN0ZBA&ctype=5&q=&nis=4&ved=2ahUKEwjEn9uC6ZqDAxVWUaQEHcKUAoYQ9aACKAB6BAgFEEs&adurl=
- https://www.googleadservices.com/pagead/aclk?sa=L&ai=DChcSEwj7uOKC6ZqDAxVElmgJHXYHCSUYABALGgJ3Zg&ase=2&gclid=CjwKCAiA-P-rBhBEEiwAQEXhH1qqZn0LEoQUtvvU6F0qisSvfKqugIB2-mxGiVBen4GganUrLYEdnRoCqzQQAvD_BwE&ohost=www.google.com&cid=CAESVuD2ckX_Az727HrWjalGelVV2z-X5VIUClVn0zVAna3pnyPCXoQsErpbOl38jvF_7ld6iQlCIRAR4EasP_PGFoF9q2yy4Yn_-LuOASgL_Epi2Zm8c0Ze&sig=AOD64_0yQL9PY7gm_tVE26-iTMS_t9b3Rw&ctype=5&q=&nis=4&ved=2ahUKEwjEn9uC6ZqDAxVWUaQEHcKUAoYQ9aACKAB6BAgFEFY&adurl=

10.4. Web Sites:

www.autodisk.com
www.cadalyst.com
www.paug.org - the Professional AutoCAD User Group
https://help.autodesk.com/view/ACD/2022/ENU/?guid=GUID-D58D2058-FAD1-4785-A58B-5E946581BD1E
https://www.autodesk.com.au/shortcuts/autocad
https://help.autodesk.com/view/INVNTOR/2022/ENU/?guid=GUID-CC6CC529-8F40-44CB-B458-5F37ED346370

https://en.wikipedia.org/wiki/AutoCAD

https://all3dp.com/2/best-autocad-books/

Course Directors	Name	Signature
Teaching staff	**Assoc. Prof. Sahar Ezz El Arab Ramadan**	
Course coordinator	**Assoc. Prof. Sahar Ezz El Arab Ramadan**	
Program coordinator	**Dr. Mohamed Nabil El Sbaie**	
Head of the Department	**Dr .Prof. Essam Kalifa**	
Date of approval	**Oct -Jan 2023 – 2024**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	
Course Specification	
ARE 144: Theory of Structure (B)	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Theory of Structure (B)			**Course Code:**		ARE144	
Program /level	Architectural Engineering			Junior			
Term/ Academic year:	Oct -Jan 2023 – 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	---
Pre-Requisite	ARE 124						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Integrat comprehensive knowledge in the formulation of objectives and project innovation in the theory of structures.
- Use of analytical tools during specialized procedures.
- Innovate appropriate solutions for structures analysis of buildings
- Enhance communication within the project teams

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1.Knowledge of structural analysis of constructed according to the theory of structures.

CLO 2. Conduct general programs and functional relations for deformation of statically determinate structures.

CLO 3. Produce projects for structural analysis of constructed

CLO 4. Articulate creative and innovative thinking in solving problems and making designs.

CLO 5. Develop effective cooperation within the project work teams.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A1,A2,A7	B3

4- Mapping Course Los to NARS

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING GRADUATE	**A1.** Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**LO 1**. Proficient in the use of methods of structural analysis and design work required by the structures. **LO 2**. Classifies sections and identifies their character and system.
	A.2. 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	**LO 4**. Defines the symbols and terminology and equations usedin methods of structural analysisof the reinforced concrete.

	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 1.** Proficient in the use of evidence of planning and design work required by the design. **LO 3.** Determines the overall program and functional relationships of structural analysis projects.
COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B3.** .Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.	**LO 1**. Proficient in the use of methods of structural analysis and design work required by the structures **LO 3.** Determines the overall program and functional relationships of structural analysis projects. **LO 4**. Defines the symbols and terminology and equations used in methods of structural analysis of the reinforced concrete. **LO5.** Designs concrete elements, according to structural analysis. **LO 6.** Select the appropriate structural system and materialfor different civil and architectural works

Course Content:

5.1. Course Description (As indicated in program Bylaw):

Elastic deformation of statically determinate structures. Method of continuous beams, method of virtual work, statically indeterminate beams and frames . Consistent deformation method, equation of 3- moments , moment distribution method , live loads on continuous beams and internal normal stresses . Oblique bending, eccentric compression or tension and buckling of columns. BWA

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	**Introduction**	2	1	2	0	**LO 2, LO 4, LO 6**
Week-2	The conjugate beam method for the deflection	2	1	2	0	**LO 2, LO 4, LO 6**
Week-3	Complete The conjugate beam method for the deflection	2	1	2	0	**LO 2, LO 4**
Week-4	The virtual work method for the deflection	2	1	2	0	**LO 2, LO 6**
Week5	Complete The virtual work method for the deflection	2	1	2	0	**LO 6**
Week-6	Revision on the conjugate beam method and the virtual work method for the deflection	2	1	2	0	**LO 3, LO** 6
Week-7	Consistence Deformation Method	2	1	2	0	**LO 1, LO 4**
Week-8	**Midterm Exam.**					
Week-9	Influence Lines	2	1	2	0	**LO 3, LO 5**
Week-10	Revision, Quiz	2	1	2	0	**LO 5, LO** 6
Week-11	Three Moment Equation Method	2	1	2	0	**LO 5, LO** 6
Week-12	Buckling of columns	2	1	2	0	**LO 1, LO 3, LO 5, LO** 6
Week-13	Eccentric Compression and Tension	2	1	2	0	**LO 1, LO 3, LO 5, LO** 6
Week-14	Revision.	2	1	2	0	**LO 1, LO 2, LO 6**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	------
2nd	----------	------

5- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
CLO 1		√			√	
CLO 2	√	√	√			
CLO 3	√	√	√			√
CLO 4					√	√
CLO 5				√		

6- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)					
	Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Face-to-Face Lecture						√
Online Education	-	-	-	-	-	-
Tutorial/ Exercise	√		√	√	√	
Group Discussion		√		√	√	√
Laboratory	-	-	-	-	-	-
Site Visit				√		
Presentation	√	√		√	√	√
Mini Project	√		√		√	
Research and Reporting	√	√	√	√		√
Brain Storming		√	√	√	√	
Self-Learning	-	-	-	-	-	-

7- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Written Exam	√	√	√		√	√
Online Exam	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-
Quiz	√		√		√	√
Lab Exam	-	-	-	-	-	-
Take-Home Exam	√	√	√	√	√	√
Research Assignment	√	√	√	√		√
Reporting Assignment	√	√	√	√		√
Project Assignment	√		√		√	√
In-Class Questions	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	50 min.
End of term laboratory exam (*Lab*)	-	-	-
End of term Oral exam	-	-	-
Tutorial and report assessment (*Term Work*)	**30**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**10**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- El- Dakhakhni "Theory of Structures Part I "(https://www.prof-eng.net/2022/07/Theory-of-Structures-P.1-and-P.2-EL-Dakhakhni-pdf.html#Target0)
- El- Dakhakhni "Theory of Structures Part II".(https://www.prof-eng.net/2022/07/Theory-of-Structures-P.1-and-P.2-EL-Dakhakhni-pdf.html#Target0)
- The conjugate beam method for the deflection, The virtual work method for the deflection, Consistence Deformation Method, Influence Lines, three moment equatuons. Dr. Yasser El-Leathy and eng/ Akram moustafa 2013.

10.3. Recommended Books:

- Kenneth Derucher, et.al "Static Analysis of Determinate and Indeterminate Structures" First edition published 2022, Taylor & Francis Group, LLC DOI: 10.1201/9781003246633
- Timoshenko, "Strength of Material Part I and II " Bee F. P., Johnston E. R. Dewolf J. T. and Mazurek D. F, Mechanics of Materials, McGraw Hill Ltd, 2009.

10.4. Web Sites:

- Structural Analysis, Nabeel Abdulrazzaq Jasim. University of Basrah

https://www.researchgate.net/publication/315828385

Course Directors	Name	Signature
Teaching staff	**Dr. Mahmoud hasan kater**	
Course coordinator	**Dr. Mohamed Nabil El Sebai**	
Program coordinator	**Dr. Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Essan Said Farag Khalifa**	
Date of approval	**Oct -Jan 2023 – 2024**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 151 : Design of Complex Units

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Design of Complex Units			**Course Code:**		ARE 151	
Program / level	Architectural Engineering			**JUNIOR**			
Term/ Academic year:	Oct - Jan 2023- 2024			**Credit Hours:**		3	
Contact Hours:	6	**Lecture:**	-----	**Tutorial:**	6	**Laboratories:**	-----
Pre-Requisite	ARE141- ARE112						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

•Identify the process of designing mid-rise residential buildings composed of several units per floor, with regard to the Building Law No. 119 of 2008 and its modifications

•Analyze the site's content and site elements.

•Apply structure system and construction technology.

•Explain the relationships between internal and external spaces..

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. identify the types of houses and the design of complex residential units.
CLO 2. Explain the deal with mixed-use residential
CLO 3.Choose a structured system and architectural style for the project
CLO 4.Explain site analysis. and relationship matrix
CLO 5.Develop Creative and innovative thinking in solving problems and making designs.

3- ***Relationship between the course and the Competencies :***

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A3,A6,A4,A9	B1,B2,B3

4- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES ofENGINEERING	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development..	**LO 1.** Develop a creative and innovative way to problem solving and design **LO 2**. Organize different ideas, views, and knowledge from a range of sources.. **LO 3.** Collect data, and information and engage in life-long self learning discipline **LO 4.** Integrate the engineering knowledge, understanding, and feedback to improve design, products and/or services.
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 5.** Apply knowledge of Architecture, science, information technology, design,business context and engineering practice integrally to solve engineering problems **LO 6**. Produce three a dimension model with innovation and creativity in the exploration of design.
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO 7**. Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.

	A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	**LO 8**. Design innovative appropriate solutions with diverse scales and complexity
COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B1.** Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate **.** knowledge of: history and theory, relatedfine arts, local culture and heritage, technologies and human sciences	**LO 5.** Apply knowledge of Architecture, science, information technology, design,business context and engineering practice integrally to solve engineering problems **LO8**.Design innovative appropriate solutions with diverse scales and complexity
	B2. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale	**LO 8**. Design innovative appropriate solutions with diverse scales **LO 1.** Develop a creative and innovative way to problem solving and design and complexity
	B.3. Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 3.** Collect data, and information and engage in life-long self learning discipline **LO 7**. Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. **LO 8**. Design innovative appropriate solutions with diverse scales and complexity

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The aim of the course is to study the design process of mid-rise residential buildings composed of several units per floor, with regard to the Building Law No. 119 of 2008 and its modifications or any latest version of the building law which govern the building process in Egypt. In addition, the course introduces to the students how to deal with mixed-use residential/commercial apartment blocks. Examples of projects would include: mid-rise residential/commercial buildings, small residential community, resort compound of villas, or a cluster of housing units of different types. the student should practice Data gathering & analysis, study of different elements & components of residential units, separately & compound together, Study of housing types, design of complex residential units. Sketch designs of special nature will be used.

The aim of the course is to study the design process of mid-rise residential buildings composed of several units per floor, with regard to the Building Law No. 119 of 2008 and its modifications or any latest version of the building law which govern the building process in Egypt. In addition, the course

introduces to the students how to deal with mixed-use residential/commercial apartment blocks. Examples of projects would include: mid-rise residential/commercial buildings, small residential community, resort compound of villas, or a cluster of housing units of different types. the student should practice Data gathering & analysis, study of different elements & components of residential units, separately & compound together, Study of housing types, design of complex residential units. Sketch designs of special nature will be used.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction of the project and identification of the project program, course objectives, with open discussion	**3**	0	6	0	**LO2, LO3, LO4, LO5**
Week-2	Studio Work – workshop group work Site analysis ,Various studies of the project (Zoning - Relationships...etc) Brainstorming with open discussion	**3**	0	6	0	**LO3, LO4**
Week-3	Research work ,group discussion & Submission of 1st design sketches of the residential Plan	3	0	6	0	**LO1 LO2, LO3,LO4,**
Week-4	Review the residential Plans & structure system	3	0	6	0	**LO6, LO7**
Week5	Quiz (1)					
Week-6	Design other plans	3	0	6	0	**LO6, LO7**
Week-7	Develop all plans	3	0	6	0	**LO6, LO7**
Week-8	**Midterm Exam.**					
Week-9	Workshop and Development of plans, Section and elevation sketches	3	0	6	0	**LO2, LO3, LO4, LO5LO8, LO9**
Week-10	Review Section and elevation , 3D modeling	3	0	6	0	**LO2, LO3, LO4, LO5, LO8**
Week-11	Review of plans, layout, sections, ,, and discussion	3	0	6	0	**LO2, LO3, LO4, LO5LO8, LO9**
Week-12	\ Development of plans ,layout ,elevations	3	0	6	0	**LO1,LO2, LO3,LO4,**

	sections, 3D modeling+					**LO5LO8, LO9**
Week-13	final project (Evaluation and discussion)	3	0	6	0	**LO2, LO3, LO4, LO5LO8, LO9**
Week-14	General revision and discussion	3	0	6	0	**LO1,LO2, LO3,LO4, LO5LO8, LO9**
Week 15	**Final Exam.**					

5- Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO 1	✓	✓		✓			✓	✓
CLO 2	✓				✓			✓
CLO 3	✓					✓	✓	✓
CLO 4		✓	✓	✓	✓	✓	✓	
CLO 5							✓	✓
CLO 6	✓		✓	✓	✓		✓	✓
CLO 7	✓	✓			✓	✓	✓	✓

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)							
	General	ARC						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	✓	✓	✓	✓	✓	✓	✓	✓

Online Education								
Tutorial/ Exercise	✓	✓	✓		✓	✓	✓	✓
Group Discussion		✓		✓			✓	
Laboratory								
Site Visit	✓	✓						
Presentation	✓	✓		✓		✓		✓
Mini Project		✓			✓	✓	✓	
Research and Reporting	✓		✓	✓		✓	✓	✓
Brain Storming	✓	✓	✓		✓	✓	✓	
Self-Learning				✓	✓			

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8. Assessment

8.1. Course Assessment Methods

Course Learning Objectives	**Learning Outcomes (LOs)**							
	Architectural Engineering							
	LO 1	**LO 2**	**LO 3**	**LO 4**	**LO5**	**LO6**	**LO 7**	**LO 8**
Written Exam	√	√	√	√	√	√	√	√
Online Exam	–	–	–	–	–	–	–	–
Oral Exam	–	–	–	–	–	–	–	–
Quiz	√	√	√	–	–	–	√	–
Lab Exam	–	–	–	–	–	–	–	–
Take-Home Exam	–	–	–	–	–	–	–	–
Research Assignment	√	–	√	√	√	–	√	√
Reporting Assignment	√		–	√	√	√	–	–
Project Assignment	√	√	√	–	–	√	√	√
In-Class Questions	√	√	√	√	√	–	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**		
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	
Total Mark	**100**		

9- Facilities Required:

A- Projector.
B- Computer.
C- White board
D- Architectural software programs, AutoCad, 3Dmax, Photoshop, etc.

10- List of References:

10.1. Course Notes:

- Lecture notes
- Sketches, lecture notes, presentations

10.2. Required Text Books and Additional References:

- CHING, Francis DK. *Architecture: Form, space, and order*. John Wiley & Sons, 2023.
- PRESSMAN, Andy (ed.). *Architectural graphic standards*. John Wiley & Sons, 2007.
- KIM, Jung Soo; GARLAN, David. Analyzing architectural styles. *Journal of Systems and Software*, 2010.
- Neufert, E., Architect's Data,fourth edition , 2012.

Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.

10.2. Recommended Books:

- CHING, Francis DK. *Architecture: Form, space, and order*. John Wiley & Sons, 2023.

- محمود حسن عبد الرجال; محمد. نحو منهجية علمية متقدمة لاستخدام تقنية الذكاء الاصطناعي في استوديوهات التصميم المعماري (تطبيق عملي بمشاركة طلاب العمارة) .*مجلة العمارة والفنون والعلوم الإنسانية* .2023 ,.

- يوسف; ديانا. تأثير التباين على عناصر التصميم الداخلي .*مجلة جامعة مصر للدراسات الإنسانية*260-235 :1.2 ,2021 ,

10.4. Web Sites:

www.fosterandpartners.com/

- **www.sagradafamilia.org/en/**
- www.skyscrapercity.com/
- https://www.asla.org/
- www.ekb.eg/ar
- **www.architectmagazine.com**

Course Directors	Name	Signature
Teaching staff	Dr. maysa selim	
Course coordinator	Dr. maysa selim	
Program coordinator	Dr. Mohamed el sebai	
Head of the Department	Prof. Esam Khalifa	
Date of approval	Oct- Jan 2023-2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 152 : Execution Designs (1)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Execution Designs (1)			**Course Code:**	ARE 152		
Program / level	Architectural Engineering			**JUNIOR**			
Term/ Academic year:	Oct -Jan 2023 - 2024			**Credit Hours:**	3		
Contact Hours:	5	**Lecture:**	1	**Tutorial:**	4	**Laboratories:**	0
Pre-Requisite	----						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- ✓ Detailed studies of wide-span structures.
- ✓ Detailed studies of stair cases with different designs and materials.
- ✓ Preparations of working drawings completely detailed and ready for execution, including architectural drawings, schedules, miscellaneous drawings details.
- ✓ Interpret and revision of structural – electrical - sanitary drawings

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Preparing integrated architectural engineering drawings, ready for implementation, in wide-span structures.

CLO 2. Preparing complete detailed drawings, for basic and simple constructional elements, in the building.

CLO 3. The ability to choose the structural system, and the distribution of the structural elements in the building, in a way that maintains the quality of architectural design.

CLO 4. The ability to communicate with workers and technicians related to the implementation of various architectural works in the building.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of Achitecture
Program Academic Standards that the course contributes in achieving	A4, A6, A10	B2, B3, B5

4- Mapping Course Los to NARS

Field	Program (CBEs) that the coursecontribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 1.** Discover building codes and standards, in preparing drawingswith scale; 1/50 (plans, elevations, sections). **LO 2.** Choose the best contemporary techniques and techniques when preparing architectural details.
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO 3**. Combine requirements for other relevant disciplines, in preparing architectural drawings.
	A.10. Acquire and apply new knowledge and practice self, lifelong, and other learning strategies.	**LO 4**. Apply new knowledgeand techniques, when implementing the building.
COMPETENCIES of Architecture	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 5**. Validate dimensionsand requirements of various fixtures and fittings within the building (details – electrical –sanitary - …).

	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 6.** Recognize structural systems and techniques, and distribution of the structural elements in proportion to thedesign of the building.
	B.5 Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO 7.** Discover role of architect in design and implementation stages of the building, and relationship between consultant, owner and contractor.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Detailed studies of wide-span & span structures, cladding and facing for skeleton structures, design and application of metal section for openings and partitions, derailed studies of stair cases with different des1glis and materials, preparations of working drawings completely detailed and ready for execution including architectural drawings, details, structural sections plumbing and sanitary drawings, Electrical drawing, miscellaneous drawings (I.e. elevators..., etc.)

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	▪ Architect professional and his relation with other engineering specialises. ▪ Co-ordinate and reconcile contradictions between executive architectural drawings, and executive drawings for other specialties related to project. ▪ Enumerate project stages	3	1	4	0	**LO 6, LO7.**
Week-2	Preparing a complete set of executive architectural drawings, for a project with: specific function, and wide span: ▪ **Site plan (or layout)** ▪ **landscape working design plan** • **Floors plans**	3	1	4	0	**LO 1. LO 3. LO 5. LO 6.**

Week-3	Preparing: symbols, schedules and specifications, of: **openings (windows and doors) and Finishings (out-door and in-door)**	3	1	4	0	**LO 2.** **LO 4.**

Week-4	▪ Preparing a complete set of executive architectural drawings, for a project with: specific function, and wide span: **Building facedes &Building sections** ▪ **Quiz 1**	3	1	4	0	**LO 1.** **LO 3.** **LO 4.** **LO 5.** **LO 7.**
Week5	**Stairs sections and details**	3	1	4	0	**LO 2.** **LO 5.** **LO 7.**
Week-6	Wooden details **(balustrades and railings)**	3	1	4	0	**LO 2.** **LO 6.**
Week-7	Miscellaneous details **(flower boxes, and fountains)**	3	1	4	0	**LO 2.** **LO 6.**
Week-8	**Midterm Exam.**					
Week-9	Wooden details **(wooden floors)**	3	1	4	0	**LO 2.** **LO 6.**
Week10	▪ **Metal details** ▪ **Quiz 2**	3	1	4	0	**LO 2.** **LO 6.**
Week-11	Miscellaneous details **(settlement \ expansion joints)**	3	1	4	0	**LO 2.** **LO 3.** **LO 6.** **LO 7.**
Week-12	**Patterns of doors and mounting furniture** … preparing detailed drawings.	3	1	4	0	**LO 2.** **LO 6.**
Week-13	**Patterns of windows & mounting furniture** … preparing detailed drawings.	3	1	4	0	**LO 2.** **LO 6.**
Week-14	▪ Revision on details ▪ Answer students' questions and inquiries about all the details previously explaine	3	1	4	0	**LO 1.** **LO 4.** **LO 7.**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	.....
2nd	NA	.....

6- *Matrix of Course Objective and LOs*

Course Learning Objectives	Learning Outcomes (LOs)						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
CLO 1	√		√		√	√	
CLO 2		√		√	√	√	
CLO 3	√		√				√
CLO 4		√		√		√	

7- *Course Teaching and Learning Methods:*

Teaching and Learning Methods	*Learning Outcome*(LOs) Architectural						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Face-to-Face Lecture	√	√	√	√	√	√	√
Online Education	---	---	---	---	---	---	---
Tutorial/ Exercise	√	√	√	√	√	√	√
Group Discussion	---	---	---	---	√	√	---
Laboratory	---	---	---	---	---	---	---
Site Visit	---	---	---	---	---	---	---
Presentation	√	√	√	√	√	√	√
Mini Project	√	√	√	√	√	√	√
Research and Reporting	---	√	---	---	---	---	---
Brain Storming	---	---	√	√	---	---	√
Self-Learning	√	---		√	---	---	---

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	Architectural						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Written Exam	√	√	√	√	√	√	√
Online Exam	---	---	---	---	---	---	---
Oral Exam	---	---	---	---	---	---	---
Quiz	√	√			√	√	√
Lab Exam	---	---	---	---	---	---	---
Take-Home Exam	---	---	---	---	---	---	---
Research Assignment	---	√	---	√	---	---	---
Reporting Assignment	---	---	---	---	---	---	---
Project Assignment	√	√	√	---	√	√	√
In-Class Questions	---	√	---	√	√	√	---

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam	**30**	15th	210 min.
Midterm written Exam	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	**-**	**-**
End of term Oral exam	**-**	**-**	**-**
Tutorial, researches and project assessment	**20**	weekly	**-**
Quizzes	**20**	According to the schedule	**-**
Total Mark	**100**		

9- Facilities Required:

A- Projector
B- Computer
C- Whiteboard

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Any book in Execution designs & Architectural details in the libarary of institute.

10.3. Recommended Books:

- Ramsey & Sleeper, Architectural Graphic Standards, The American Institute of Architects, John Wiley & Sons, Inc., New Jersey, U.S.A., 11th Edition, Student Edition Edited by Bruce Bassler, 2008.
- Francis D. K. Ching, Building Construction Illustrated, John Wiley & Sons, Inc., New Jersey, U.S.A., 4th edition, 2008.

10.4. Web Sites:

https // www.ekh.eg The Egyptian Knowledge Bank (EKB) بنك المعرفة المصرى

Course Directors	Name	Signature
Teaching staff	Dr. Mahmoud Mansour Saleh	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct .- Jan 2023-2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 153: Climate and Architecture of the Desert

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Climate and architecture of the desert			**Course Code:**		ARE 153	
Program/level	Architectural Engineering			Junior year			
Term/ Academic year:	Oct.-Jan.2023 - 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	-----
Pre-Requisite							
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- To comprehensively understand the relationship between desert climate and architectural design.
- To equip students with the knowledge of sustainable and climatically responsive architectural practices in desert environments.
- To foster critical thinking regarding integrating ecological considerations and human comfort in desert architectural design.

- Course Learning Objectives (CLO):

At the end of this course, students should be able to :

CLO 1. **Develop architectural plans considering desert regions' engineering, environmental, and social requirements.**

CLO 2. **Supervise and assess the implementation of architectural designs while coordinating with multiple disciplines in the desert context.**

CLO 3. **Collaborate within multi-disciplinary teams to devise sustainable and culturally sensitive architectural solutions for the desert.**

CLO 4. **Design architectural solutions tailored to meet human needs, considering environmental aspects specific to desert climates.**

CLO 5. **Develop environmentally conscious architectural designs integrating structural and technological considerations for desert regions.**

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARC
Program Academic Standards that the course contributes in achieving	A6, A7	B2, B3

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the coursecontributes to achieve.	Learning Outcomes (LOs)
COMPETENCIES of ENGINEERING	A.6: Plan, supervise, and monitor implementation of engineering projects, considering other trades' requirements.	LO1: Analyze the impact of desert climate factors on architectural design decisions. LO2: Integrate passive cooling and solar techniques into architectural solutions for desert regions.

	A.7: Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	LO3: Evaluate desert-specific architectural components to address environmental challenges.
COMPETENCIES of ARCHITECTURE	B2. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	LO4: Synthesize the relationship between human needs, building design, and the desert environment.
	B3. Generate ecologically responsible , environmental conservation and rehabilitation designs; through understanding of : structural design , construction , technology and engineering problems associated with building designs .	LO5: Apply multi-disciplinary approaches to create ecologically responsible architectural designs for desert regions.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Man and environment, desert sun heat, heat transfer, wind, wind control, pollution, Humidity, natural lighting and comfort zone. Desert architectural components& design Considerations in desert regions. In addition to, passive cooling and solar techniques.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	**Introduction to Climate and Architecture of the Desert**	2	1	2	0	**LO1, LO3**
Week-2	**The types of deserts.**	2	1	2	0	**LO1**
Week-3	**Climate zone classifications.**	2	1	2	0	**LO1**
Week-4	**Wind and Air Pressure**	2	1	2	0	**LO1**
Week-5	**Thermal comfort zone Quiz**	2	1	2	0	**LO4**
Week-6	**Evaporation andHumidity**	2	1	2	0	**LO3**
Week-7	**Midterm-Exam.**					
Week-8	**Solar Radiation.**	2	1	2	0	**LO2, LO5**
Week-9	**Heat Transfer**	2	1	2	0	**LO1, LO3**
Week-10	**Thermal mass**	2	1	2	0	**LO4, LO5.**
Week-11	**Architecture and Desert**	2	1	2	0	**LO1, LO3, LO4**
Week-12	**Architecture and Desert**	2	1	2	0	**LO1, LO3, LO4**
Week-13	**Project**	2	1	2	0	**LO4, LO5.**
Week-14	**Project Submission**	2	1	2	0	**LO4, LO5.**
Week-15	**Midterm-Exam.**					

5.3. Experiment Topics: (not applicated)

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objectives and LOs

Course Learning Objectives	LO 1	LO 2	LO 3	LO 4	LO 5
CLO 1	✓		✓		
CLO 2		✓			✓
CLO 3			✓		✓
CLO 4				✓	
CLO 5		✓		✓	✓

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)			
	General		ARECHITECTURE	
	A6	A7	B2	B3
	LO1, LO2	LO3	LO4	LO5
Face-to-Face Lecture	✓	✓	✓	✓
Online Education				
Tutorial/ Exercise	✓	✓	✓	✓
Group Discussion				
Laboratory				
Site Visit				
Presentation	✓			
Mini Project			✓	✓
Research and Reporting	✓	✓		
Brain Storming				
Self-Learning				

8- Assessment

- Individual Research.
- Group Research.
- Exercise sheets.
- Presentations.
- Mini Project.

8.1. Course Assessment Methods:

Assessment Methods	***Learning Outcome*(LOs)**			
	General		**ARECHITECTURE**	
	A6	A7	B2	B3
	LO1, LO2	**LO3**	**LO4**	**LO5**
Written Exam	✓▪	✓	▪✓	✓▪
Online Exam				
Oral Exam				
Quiz	✓	✓		
Lab Exam				
Take-Home Exam				
Research Assignment	✓	✓		
Reporting				▪
Assignment	✓	✓	✓	✓
Project Assignment			✓	✓
In-Class Questions	✓	✓	✓	

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	7th	60 min.
End of term laboratory exam (*Lab*)	**-**	---	---
End of term Oral exam	**-**	---	---
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

a. Seminar room
b. laptop and Data show for presentation
c. Lecture hall

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- المناخ وعماره المناطق الحارة د.شفق عوض الوكيل
- المجلة العلمية /كليه الهندسة /جامعه الازهر "للتصميم في المناطق الحارة الجافة"
- مناخ وعماره الصحراء ، د خالد فجال

10.3. Recommended Books:

1. Al-Kodmany, Kheir. Understanding Islamic Architecture. London: Routledge; 2013.
2. Stoffel, Kenneth, and Marcia Stoffel. Sustainable Architecture and Building Design in Arid Regions. New York: McGraw-Hill Education; 2017.

10.4. Journals/Magazines:

1. Smith, Jane. "Innovative Designs for Desert Environments." Architecture Today. 2021; 15(3): 120-135.
2. Johnson, Mark. "Sustainable Approaches to Desert Architecture." Journal of Sustainable Design. 2019; 8(2): 75-88.

10.5. Websites/Online Sources:

1. World Green Building Council. "Sustainable Design Principles for Desert Architecture." World Green Building Council. https://www.worldgbc.org/. Accessed November 1, 2023.
2. Desert Architecture Foundation. "Innovative Solutions for Desert Building Design." https://www.desertarchfoundation.com/. Accessed October 15, 2023.

Course Directors	Name	Signature
Teaching staff	DR. Ghada Mohamed Amin Assal	
Course coordinator	DR. Ghada Mohamed Amin Assal	
Program Coordinator	Dr. Mohamed M. Elsebaay	
Head of the Department	Prof. Essam Khalifa	
Date of approval	Oct.-Jan.2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 211 : Architecture Design (A)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Architecture Design (A)			**Course Code:**		ARE 211	
Program / level	Architectural Engineering			SENIOR(1)			
Term/ Academic year:	Oct.- Jan 2023 - 2024			**Credit Hours:**		3	
Contact Hours:	6	**Lecture:**	0	**Tutorial:**	6	**Laboratories:**	0
Pre-Requisite	ARE 151						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- applying the principals of community-based design of architectural compounds made up of several units (study of functional and formal relationships).
- Studying and examining sufficient data on various architectural projects with unique character and have a greater complexity of function.
- development of structure sense through models, trials of special types of advanced structures, & applications on creating architectural spaces for different functions.
- Special importance is attached to functions and forms of spaces between units.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1.	Study and analysis of sufficient data on programming, space requirements, and zoning.
CLO 2.	Analysis of case studies and similar project.
CLO 3.	Considerations of site analysis, urban context and environmental aspects.
CLO 4.	Study of building form, massing, articulation, and fenestration.
CLO 5.	The ability to suggest a suitable structural system for the given project.
CLO 6.	The use of computer-aided-design in analysis, design and presentation stages

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ChE
Program Academic Standards that the course contributes in achieving	A1, A4, A5, A7	B1, B2

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**LO 1.** Analyzing similar models to the selected project in terms of the design idea, spaces, functional relationships, climate, and surrounding environment. etc
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 2**. Select the appropriate structural systems according to the different elements of the project.
	A.5. Practice research techniques and methods of investigation as an inherent part of learning.	**LO 3.** Determine technical writing standards for scientific research.
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 4.** Developing the spirit of cooperation and integration among team members.
COMPETENCIES of ChE	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history	**LO 5**. Integrate his previous knowledge of different architectural trends and schools into the chosen design.

	and theory, related fine arts, local culture and heritage, technologies, and human sciences.	
	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 6**. Design and coordinate the general site of the project in accordance with the climatic conditions and the functional relationships between the project elements.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The Main focus of this course is applying the principals of community based design of architectural compounds made up of several units (study of functional and formal relationships). Special importance is attached to functions and forms of spaces between units. The course also includes development of structure sense through models, trials of special types of advanced structures, & applications on creating architectural spaces for different functions. The building types explored in this studio have a greater complexity of function. Emphasis is placed on building form, massing, articulation, and fenestration. Studying and examining sufficient data on various architectural projects with unique character such as community service centers, transportation hubs, public buildings

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction of the project and identification of the project	3	0	6	0	**LO1, LO2**
Week-2	Presentation of the final search	3	0	6	0	**LO3, LO 4**
Week-3	Various studies of the project (Zoning - Relationships - Spaces...etc)	3	0	6	0	**LO1, LO5**
Week-4	layout drawing (mass)	3	0	6	0	**LO2, LO6**
Week5	Quiz (1)	3	0	6	0	**LO6**
Week-6	Structural systems research and drawing the ground floor plan.	3	0	6	0	**LO2, LO3**
Week-7	Review the ground and first floor plans.	3	0	6	0	**LO4, LO3**
Week-8	**Midterm Exam.**					

Week-9	Review of the ground and first floor plans, and the beginning of the different elevations design.	3	0	6	0	**LO2, LO4, LO6**
Week-10	Review of the ground and first floor plans, and the different elevations and layout.	3	0	6	0	**LO2, LO4, LO6**
Week-11	Quiz (2)	3	0	6	0	**LO6**
Week-12	Review of all drawings and start the sections design.	3	0	6	0	**LO2, LO5, LO6**
Week-13	semi-final project presentation	3	0	6	0	**LO2, LO5, LO6**
Week-14	Final project presentation	3	0	6	0	**LO2, LO5, LO6**
Week 15	**Final Exam.**					

6- Matrix of Course Objective and LOs

Course Learning Objectives	**Learning Outcomes (LOs)**					
	LO 1	**LO 2**	**LO 3**	**LO 4**	**LO5**	**LO6**
CLO 1	√	√	–	–	√	√
CLO 2	√	√	–	–	–	√
CLO 3	–	–	√	√	–	√
CLO 4	–	–	√	√	√	√
CLO 5	–	–		√	–	√
CLO 6	√	√	√	√	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	Learning Outcomes (LOs)					
	Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO5	LO6
Face-to-Face Lecture	√	√	√	√	√	√
Online Education	–	–	–	–	–	–
Tutorial/ Exercise	√	–	√	√	√	√
Group Discussion	√	√	–	–	–	–
Laboratory	–	–	–	–	–	–
Site Visit		√	–	–	–	–
Presentation	√	√	–	–	√	√
Mini Project	–	–	–	–	–	–
Research and Reporting	√	√	√	√	√	–
Brain Storming	–	–	–	–	–	√
Self-Learning	–	–	√	√	√	√

8- Assessment

8.1. Course Assessment Methods:

Course Learning Objectives	Learning Outcomes (LOs)					
	Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO5	LO6
Written Exam	√	√	√	–	√	√
Online Exam	–	–	–	–	–	–
Oral Exam	–	–	–	–	–	–
Quiz	–	√	√	√	√	√
Lab Exam	–	–	–	–	–	–
Take-Home Exam	–	–	–	–	–	–
Research Assignment	√	√	–	–	–	√
Reporting Assignment	√	–	–	–	–	√
Project Assignment	–	–	–	–	–	√
In-Class Questions	–	–	√	√	–	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**–**	**–**	**–**
End of term Oral exam	**–**	**–**	**–**
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.

10.2. Required Text Books and Additional References:

- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.

10.3. Recommended Books:

- Specialized books on various building types

Course Directors	Name	Signature
Teaching staff	Dr. Bassem Mohamed EL-sayed Kandel	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct. -Jan 2023 -2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	
Course Specification	
ARE 212: Properties of Materials	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Properties of Materials			**Course Code:**		ARE 212	
Program /level	Architectural Engineering			Senior (1)			
Term/ Academic year:	oct -Jan 2023 – 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	0
Pre-Requisite	____						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Integrate comprehensive knowledge in the formulation of objectives and project innovation of engineering materials properties.
- Use of analytical tools during specialized procedures for engineering materials.
- Innovate appropriate solutions to study the engineering properties and limitationsof its usage.
- Enhance communication within the project teams.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1. Knowledge of engineering materials according to Egyptian standardspecifications.

CLO 2. Determine general programs and functional relations for concrete and building materials projects.

CLO 3. Produce projects for reinforced concrete material and building materials.

Creative and innovative thinking in solving problems and making designs.

CLO 4. Creative and innovative thinking in solving problems and selecting materials.

CLO 5. Effective cooperation within the project work teams.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A2, A6, A7	B3, B5

4- Mapping Course Los to NARS

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**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.	**LO 1**. Proficient in the use of engineering materials and design work required by the structures. **LO 2.** Classify materials and identify their character and system.

		LO 3. Determines the overall functional relationships between the type of engineering materials the projects.
	A6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO 5.** Proficient in creative and innovative thinking in problem-solving, and classification of materials products, systems, components, and processes.
	A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 4**. Collaborate effectively within the teamwork, positive communication, presentations and presentations, and leads and motivates the work team.
	B3. Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.	**LO8.** Critically appraise alternative architectural, spatial, constructional, structural, and material systems

COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B5.** Prepare design project briefs and documents, and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO 1**. Proficient in the use of materials and mixture design required by the structures. **LO 3**. Determine the overall functional relationships between the type of engineering materials the projects. **LO 6.** Define the symbols and terminology used in the engineering materials and building materials. **LO 7.** Classify raw materials , concrete materials, method construction. **LO 8.** Critically appraise alternative architectural, spatial, constructional, structural, and material systems

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Engineering materials : classification , sources of raw materials , selection properties , testing & inspection , specification , standardization & standard specification . Concrete ingredients: aggregates , general classifications , properties , requirements & testing . Ferrous & non ferrous materials : Type's properties , alloys scope of use & effect of heat treatment on mechanical properties . Lab tests to study the behavior of engineering materials under static loads . The structure behavior depends upon the material and its engineering properties that used in this structure . The designer should select the suitable materials to use . The executive engineer will be required to study the engineering properties and limitation of the use .

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction and engineering materials: classification, sources of raw materials	2	1	0	3	**LO 2, LO 4, LO 6**
Week-2	Requirements engineering materials: selection properties	2	1	0	3	**LO 2, LO 4, LO 6**
Week-3	Engineering materials: testing & inspection, specification	2	1	0	3	**LO 2, LO 4**
Week-4	standardization & standard specification.	2	1	0	3	**LO 2, LO 7**
Week5	Concrete ingredients: aggregates, general classifications	2	1	0	3	**LO 7**
Week-6	Concrete ingredients: properties and Requirements testing	2	1	0	3	**LO 3, LO 8**
Week-7	Ferrous & non ferrous materials: Type's properties,	2	1	0	3	**LO 1, LO 4**
Week-8	**Midterm Exam.**					
Week-9	Alloys scope of use & effect of heat treatment on mechanical properties	2	1	0	3	**LO 3, LO 5**
Week-10	**Quiz 1:** semi final	2	1	0	3	**LO 5, LO 8**
Week-11	Tests to study the behavior of engineering materials under static loads.	2	1	0	3	**LO 5, LO 8**
Week-12	The structure behavior depends upon the material and its engineering properties that used in this structure.	2	1	0	3	**LO 1, LO 3, LO 5, LO 8**
Week-13	study the engineering properties and limitation of the use.	2	1	0	3	**LO 1, LO 3, LO 5, LO 8**
Week-14	Revision.	2	1	0	3	**LO 2, LO 6, LO 7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	------
2nd	----------	------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO 1		√				√	√	
CLO 2	√	√	√					
CLO 3	√	√	√					√
CLO 4					√			√
CLO 5				√				

1- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)							
	Architectural Engineering							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√	√	√	√	√	√	√	√
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	√		√	√	√			√
Group Discussion		√		√	√	√		
Laboratory	-	-	-	-	-	-	-	-
Site Visit				√				
Presentation	√	√		√	√	√	√	
Mini Project	√		√		√			√
Research and Reporting	√	√	√	√		√	√	
Brain Storming		√	√	√	√			√
Self-Learning	-	-	-	-	-	-	-	-

2- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√		√	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√		√		√	√		√
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	√	√	√	√	√	√	√	√
Research Assignment	√	√	√	√		√	√	
Reporting Assignment	√	√	√	√		√	√	
Project Assignment	√		√		√	√		√
In-Class Questions	√	√	√	√	√	√	√	√

8.1. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	-	-	---
End of term Oral exam	-	15th	Committee
Tutorial and report assessment (*Term Work*)	**30**	weekly	
Quizzes/reports/presentation (*Term Work*)	**10**	According to the schedule	
Total Mark	**100**		

3- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

4- List of References:

4.1. Course Notes:

- Lecture notes

4.2. Required Text Books and Additional References:

- المواصفات القياسية المصرية و تعديلاتها – الصادرة عن الهئية المصرية العامة للتوحيد القياسي و جودة الانتاج.
- الكود المصري لتصميم و تنفيذ المنشأة الخرسانية 2004
- الحكم على سلامة المنشأة الخرسانية " حبيب زين العابدين - المملكة العربية السعودية "
- تكنولوجيا الخرسانة . د/ محمود امام

4.3. Recommended Book

- خواص المواد و اختباراتها الجزء الأول و الثاني – د/ محمد امين . د/ محمود امام,2007

- Elias B. Wyman, Mathis C. Skief",2010 "Organosilanes: Properties, Performance and Applications "ISBN, 1608764524,Nova science publisher
- Building Materials: Properties, Performance and Applications (Materials Science andTechnologies) UK ed. Edition by Donald N. Cornejo (Editor), Jason L.Haro (Editor) Nova Science Publishers, Inc. New York,2009, ISBN-13 978-1607410829

Course Directors	Name	Signature
Teaching staff	**Dr. Mahmoud Mohamed abd alhamed**	
Course coordinator	**Dr.Mohamed Nabil El Sebai**	
Program coordinator	**Dr. Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Essam Said Farag Khalifa**	
Date of approval	**OCT-JAN (2023-2024)**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 213 : Computer Application in Architecture (2)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Computer Application in Architecture (2)			**Course Code:**		ARE 213	
Program / level	Architectural Engineering			SENIOR (1)			
Term/ Academic year:	Oct–Jan 2023–2024			**Credit Hours:**		2	
Contact Hours:	**6**	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	6
Pre-Requisite	ARE 143						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Enhance communication between individuals and machine in 3d programs
- Use computational facilities, techniques and laboratory in 3d drawings
- Merge knowledge of 3d commands and understanding of architecture drawings.
- Use a wide range of analytical tools and software of 3d during specialized procedures.
- Annovate suitable solutions of architecture drawing problems.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Aware professional of 3d cad programme.

CLO 2. Achieve the interpret result in architectural drawings using specified commands.

CLO 3. Produce drawings in 3d program according to good understanding of 3d software packages of architecture program.

CLO 4. Create 3d modeling of contemporary architectural projects according to professional application of 3d program.

CLO 5. Apply numerical modelings solutions of architecture problems.

3- ***Relationship between the course and the Competencies :***

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARCHITECTURE
Program Academic Standards that the course contributes in achieving	A8,A9	B2

3- ***Mapping Course Los to NARS***

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO1. Communicate to contemporary form by applying 3D cad program . LO2. Use contemporary tools in different 3D drawings of architectural projects.
	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3. use creative and flexible thinking in produce 3d drawings

COMPETENCIES of ARCHITECTURAL ENGINEERING	B2. Produce designs that meet building user's requirements through understanding the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces and needs and between them to human scale.	LO4. Generate designs that fulfill the needs of building users in 3D . LO5. Recognize the importance of aligning buildings, spaces, and requirements with human scale to enhance overall user needs . LO6. Understand the relationship between people and buildings in 3D drawings LO7. Present the environment, human scale effectively in 3d drawings.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Main thrust is enhancement of human / machine communication at computer graphics interface. Formulation of individual project using 3D and modeling software.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	• The concept of the computer AutoCAD 3D modeling. • Changing the 3d-vpoint to get 3D views in parallel projections.	6	0	0	6	**LO 1**
Week-2	•Changing and saving the U.C.S and use new ucson different faces of shapes. Converting areas into 2d closed poly lines • Creating 3d solids	6	0	0	6	**LO 1,LO2**
Week-3	Understanding the Boolean operations. Union • Subtract • Intersection	6	0	0	6	**LO2,LO3**
Week-4	QUIZ NO. 1					
Week5	Study different applications on (Extrude – Press pull – Slice).	6	0	0	6	**LO1,LO2,LO3**

Week-6	Apply (Revolve – Sweep)in different elements in buildings	6	0	0	6	**LO1,LO2,LO3 ,LO4,LO5**
Week-7	Apply in (Revolve – Sweep) to create contemporary architectural forms.	6	0	0	6	**LO1,LO2 ,LO4,LO5**
Week-8	**Midterm Exam.**					
Week-9	Apply on using Loft command & solid Editing Toolbar	6	0	0	6	**LO1,LO2,LO4**
Week-10	Study new method for making dome	6	0	0	6	**LO3,LO5**
Week-11	Study new method for making different kind of stairs & handrails	6	0	0	6	**LO3,LO5,LO7**
Week-12	QUIZ 2					
Week-13	Camera & Producing the DXB files out of AutoCAD Importing the DXB files back to AutoCAD	6	0	0	6	**LO3,LO5,LO7**
Week-14	Revision.	6	0	0	6	**LO1,LO2,LO3 ,LO4,LO5,LO6 ,LO7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	-----	6
2nd	-----	-----

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)						
	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**
CLO 1	√		√			√	√
CLO 2	√						
CLO 3	√	√					
CLO 4	√		√	√			
CLO 5				√	√	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	ARCHITECURAL ENGINEERING						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Face-to-Face Lecture	√	√	√	√	√	√	√ √
Online Education	--	--	--	--	--	--	-- --
Tutorial/ Exercise	√	√	√	√	√	√	√ √
Group Discussion					√	√	
Laboratory	√	√	√	√	√	√	√
Site Visit	--	--	--	--	--	--	--
Presentation	√			√		√	√
Mini Project	--	--	--	--	--	--	--
Research and Reporting	--	--	--	--	--	--	--
Brain Storming		√	√	√		√	√
Self-Learning	--	--	--	--	√	√	--

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	ARCHITECURAL ENGINEERING						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Written Exam	√	√	√	√	√	√	√
Online Exam	--	--	--	--	--	--	--
Oral Exam	--	--	--	--	--	--	--
Quiz	√	√		√	√	√	
Lab Exam	√	√	√	√	√	√	√ √
Take-Home Exam	--	--	--	--	--	--	--
Research Assignment	--	--	--	--	--	--	--

Reporting Assignment	--	--	--	--	--	--	--
Project Assignment	√	√	√	√	√	√	√
In-Class Questions		√	√	√			

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Projector.
B- Computer
C- Printer
D- pointer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Any book in Cad 3D in the libarary in the Institute.

10.3. Recommended Books:

- الرسم الهندسى بمعونة الحاسب فى الابعاد الثلاثية – اعداد أحمد مدبولى – يوليو 2009
- ميكانيكا انتاج- الرسم بمساعدة الحاسب – المملكة العربية السعودية – المؤسسة العامة للتعليم الفنى- الأدارة العامة للتصميم وتطوير المناهج
- https://www.autodesk.com/

- Auto CAD MEP 2010,User`s Guide , by autodesk,sep 2020 .
- Steven Heather (2019): Auto CAD 3D MODELING :Exercise Work book.
- David Amadsen (2019): AutoCAD and its Applications Comprehensive .
- Munir Hamad (2018):AutoCAD 2018 3D MODELING .
- James A Leach Shawna Lockhart (2023): Autocad 2023 ,Instructor :Astudent Guide for In depth Coverage of AutoCad.
- Munir M. Hamad(2019):AutoCAD 2019 3D Modeling"
- Kristen Kurland, Jeffrey Foster :AutoCAD 3D Training Manual"
- CADArtifex :AutoCAD 3D: A Power Guide for Beginners and Intermediate Users"
- Shawna Lockhart, Eric Hoang:AutoCAD 3D Modeling and Visualization"

Books Links

- https://www.googleadservices.com/pagead/aclk?sa=L&ai=DChcSEwjDuKS26ZqDAxVgPAYAHXMKDYQYABAIGgJ3cw&ase=2&gclid=CjwKCAiA-P-rBhBEEiwAQEXhH4qtDqPVMB1TcaqW6-s4JsX8L1uOsY2NQsFFYPuvaIszT8c50fBTEBoC0vkQAvD_BwE&ohost=www.google.com&cid=CAESVuD2UbhVm11XKDsdl1E38KtPDfOrSv4i21j_1tm2GIjPIN93uLPjWt2hw3GNEpPK7vkvFEts-n-N9Gm11ySvQpZBxfpm6xIozHxwb7r1JPOxJ3qp8kUH&sig=AOD64_1sriejcEM7W--5kIqQ9FxPVHFKvQ&ctype=5&q=&nis=4&ved=2ahUKEwjR0J226ZqDAxW8TKQEHTtfBG8Q9aACKAB6BAgIEDs&adurl=
- https://www.googleadservices.com/pagead/aclk?sa=L&ai=DChcSEwjDuKS26ZqDAxVgPAYAHXMKDYQYABAMGgJ3cw&ase=2&gclid=CjwKCAiA-P-rBhBEEiwAQEXhH4MfSg9r2yZ3E2uAwn7101KL3mtW2ohCMac2cHvVAGiE_Id9GAkF2hoCrvwQAvD_BwE&ohost=www.google.com&cid=CAESVuD2UbhVm11XKDsdl1E38KtPDfOrSv4i21j_1tm2GIjPIN93uLPjWt2hw3GNEpPK7vkvFEts-n-N9Gm11ySvQpZBxfpm6xIozHxwb7r1JPOxJ3qp8kUH&sig=AOD64_1auc2pnyXnPZqqBG4w0Ag31ytnMw&ctype=5&q=&nis=4&ved=2ahUKEwjR0J226ZqDAxW8TKQEHTtfBG8Q9aACKAB6BAgIEFw&adurl=
- https://www.amazon.com/Mastering-Autocad-3D-George-Omura/dp/078211850X
- https://www.bibliocad.com/en/library/book-in-3d_68067/

10.4. Web Sites:

www.autodisk.com
www.cadalyst.com
www.paug.org - the Professional AutoCAD User Group

Course Directors	Name	Signature
Teaching staff	**Assoc. Prof. Sahar Ezz El Arab Ramadan**	
Course coordinator	**Assoc. Prof. Sahar Ezz El Arab Ramadan**	
Program coordinator	**Dr. Mohamed Nabil El Sbaie**	
Head of the Department	**Dr .Prof. Essam Kalifa**	

Date of approval	**Oct -Jan 2023 – 2024**

The Higher Technological Institute (HTI)	
Department: Department of Architecture Engineering	

Course Specification

ARE 214: History and Theories of Urban Planning

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	History and Theories of Urban Planning			**Course Code:**	ARE 214		
Program / level	Architectural Engineering			**Senior(1)**			
Term/ Academic year:	Oct-Jan 2023 - 2024			**Credit Hours:**	2		
Contact Hours:	4	**Lecture:**	1	**Tutorial:**	-	**Laboratories:**	3
Pre-Requisite	ARE 114						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Explain the basic concepts of Cities and Urban planning and the history and theories of urban planning.
- Identify the urban patterns in various civilizations all over the world
- Analyze the different theories of urban planning

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Identify the basic concepts of Cities and Urban planning

CLO 2. Explain the city, its history, evolution, and growth.

CLO 3. Describe the urban patterns in various civilizations all over the world, and also, relationships among these patterns and acting variables (cultural- religions- policies).

CLO 4. Explain planning theory as it existed in the post-industrial era.

CLO 5. Explain architectural vocabulary that helps them understand urban planning

. ***Relationship between the course and the Competencies :***

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of Architectural Engineering
Program Academic Standards that the course contributes in achieving	A8,A9	B1

3- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**LO 1** Explain concepts, ideas of design, construction, and materials of earlier architecture. **LO2**. focuses on the evolution of architecture and buildings **LO 3.** Prepare teamwork in research
	A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO4.** Compare between architecture of different eras and its distinctive Elements **LO 5**. Compare between different theories of urban planning **LO 6.** Analyze the range of Distinctive Elements, patterns, features, and traditions that have shaped and sustained cultures, and architectural characters (Planning pioneers)

COMPETENCIES of Architectural Engineering	**B1.** Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory,related fine arts, local culture andheritage, technologies and humansciences	**LO1.** explain concepts, ideas of design, construction and materials of earlier architecture. **LO 7.** Develop positively to the aesthetic, architecture, and urban identity. **LO 8**. Apply heritage philosophy of designs in architecture design projects.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

A Study for the urban and city evolution through history (starting from ancient Egypt, Mesopotamia, Greek, Roman, Middle ages, Renaissance).The industrial revolution and its effect on the pattern of the city, Trends and theories of city planning. Students will be required to participate in collecting and analyzing data concerning one of the Utopians and presenting their final report.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction, prehistoric communities, Mesopotamian civilization.	4	2	2	0	**LO 2-LO 3 LO4**
Week-2	Egyptian civilization	4	2	2	0	**LO 2--LO 3 LO 4-LO 6**
Week-3	Greek civilization	4	2	2	0	**LO2-LO3**
Week-4	Roman civilization	4	2	2	0	**LO4-LO6**
Week5	Complete roman civilization	4	2	2	0	**LO8**
Week-6	Medival town, Renaissance	4	2	2	0	**-**
Week-7	**Midterm Exam.**					
Week-8	The New theories ofcity planning. The industrial city The model Town	4	2	2	0	**LO5-LO7 LO3**
Week-9	Introduction to city theory	4	2	2	0	**LO5-LO7**

Week-10	The linear city theory	4	2	2	0	**LO5-LO7**
Week-11	The garden city theory The satellite towns	4	2	2	0	**LO1-LO5**
Week-12	The Neighborhood +the city of tomorrow + different town shapes	4	2	2	0	**LO1-LO5**
Week-13	Final Project	2	2	0	0	**LO8**
Week 14	General Revision	2	2	0	0	**-**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	.....	.....
2nd	.....	.....

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO 1		√				√	√	
CLO 2	√	√	√	√			√	√
CLO 3	√	√	√			√		√
CLO 4	√		√		√			√
CLO 5		√		√		√	√	

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs) Architecture Engineering							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√	√	√	√	√	√	√	√
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	√	√	√	√	√	√	√	√
Group Discussion		√				√	√	
Laboratory	-	-	-	-	-	-	-	-
Site Visit					√			
Presentation	√	√			√	√	√	√
Mini Project				√			√	√
Research and Reporting	√	√	√		√	√		
Brain Storming		√	√	√	√			√
Self-Learning	-	-	-	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√	√	√	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√		√		√	√		√
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	-	-	-	-	-
Research Assignment	√	√	√	√		√	√	
Reporting Assignment	√	√	√	√		√	√	
Project Assignment	√	√			√	√	√	√
In-Class Questions	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	7th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	---
End of term Oral exam	**-**	15th	---
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	14th	--
Total Mark	**100**		

9- Facilities Required:

A- White board.
B- Projector.
C- Computer.

10- List of References:

10.1. Course Notes:

- **Lecture notes**

10.2. Required Text Books and Additional References:

- CARMONA, Matthew. Public places urban spaces: The dimensions of urban design. Routledge, 2021.
- Planning Methodology and History by Wegener-2009
- WATES, Nick; THOMPSON, John. The Community Planning Event Manual: How to use collaborative planning and urban design events to improve your environment. Routledge, 2013.

10.3. Recommended Books:

- Planning and Urban Design StandarA Planners Dictionary by Michael Davidsods by Emina Sendich (Editor); American Planning Association Staff -2006
- CARMONA, Matthew. Public places urban spaces: The dimensions of urban design. Routledge, 2021.

10.4. Web Site

http: //www.investment.gov.eg.

http://www.evdata.worldbank.org

Course Directors	Name	Signature
Teaching staff	Dr.Mohamed Riad	
Course coordinator	Dr. maysa selim	
Program coordinator	Dr.Mohamed Nabil	
Head of the Department	Prof. Esam Khalifa	
Date of approval	Oct-Jan 2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 215: Theories of Architecture (B)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Theories of Architecture(B)			**Course Code:**		**ARE 215**	
Program /Level	Architectural Engineering			Junior			
Term/ Academic year:	Oct.-Jan. 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	2	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	0
Pre-Requisite	ARE 125						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Explain different academic research methodologies, academic writing, analysis, and architectural criticism to be applied in logic research as a part of the course work.
- Identify the latest theories and architectural trends in the 20th and 21st centuries.
- Understand the principles, features, and pioneers of every theory.
- Model and sketch the different architectural trends and styles in the 20th and 21st centuries.

2- Course Learning Objectives (CLO):

At the end of this course, students should be able to:

CLO 1. Explain the different academic research methodologies and the ability to write academically.

CLO 2. Gaining the skill of analysis and architectural criticism.

CLO 3. Distinguishing the difference between the architecture theories in the 20th and 21st centuries and the characteristics of the building theory through its features and elements.

CLO 4. The ability to analyze the building, access its elements, and deduce the building reference by the surrounding variables.

Field	National Academic Reference Standard (NARS	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARCHITECTURAL ENGINEERING
Program Academic Standards that the course contributes to achieving	A5, A6, A8	B1, B2

3- ***Mapping Course Los to NARS***

Field	The program that the course contributes to achieving	Learning Outcomes (LOs)
COMPETENCIES of ENGINEERING	A5. Practice research techniques and methods of investigation as an inherent part of learning.	LOs 1: Discuss the different academic research methodologies. LOs 2: Apply analysis and architectural criticism. LOs 3: Write academically.
	A6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LOs 7: Deduce the classification of the building through its features and environment.
	A8. Communicate effectively – graphically, verbally, and in writing – with a range of audiences using contemporary tools.	LOs 4: Examine the difference between the architectural theories in the 20th and 21st centuries. LOs 5: Classify the theories applied to the building through its characteristics and elements.
	B1. Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences.	LOs 4: Examine the difference between the architectural theories in the 20th and 21st centuries. LOs 5: Classify the theories applied to the building through its characteristics and elements.
COMPETENCIES of ARCHITECCTURAL ENGINEERING	B4. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	LOs 6: Analyze the building and access its elements. LOs 7: Deduce the classification of the building through its features and environment.

5- Course Content:

5.1. Course Description (As indicated in the program Bylaw):

The course aims to provide sufficient knowledge of the latest theories and architectural trends between the 20th and 21st centuries. to study the Principles & features of contemporary architecture: pre-international architecture, international style, expressionism between the World Wars, technical advances of the late 20 century, & new trends in the 21st century (deconstruction, sustainable architecture...etc.). To be introduced to different academic research methodologies, academic writing, analysis, and architectural criticism in order to be applied in logic research as a part of the course work.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			LOs Covered by Course
			Lec	Tut.	Lab.	
Week -1	General introduction to the course contents. Definitions of architecture and theories of architecture. The difference between the history and theories of architecture. Rationalism and Romanticism movement. Assignment: Describe and analyze five projects of the most important Arab architects in the twentieth century.	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.
Week-2	Modern architecture: Definition, Features, Theories, trends, and Examples. Intentional style: Pioneers, principles, and examples. clarify the features of the building. Assignment: Choose one of the buildings and clarify the features of the building.	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.
Week-3	The different between Modern architecture schools Assignment: sketch 3 building of modern architecture	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.
Week-4	Academic waiting lecture 1 - Quiz 1	2	1	2	0	LOs 1, LOs 2, LOs 3,
Week5	Postmodern Architecture: Its language, criticism, methods, and principles. Assignment: Mention examples of postmodern architecture in Egypt and analyze one of them.	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.

Week-6	Postmodern Architecture: Trends, Features, and Examples. Assignment: Comparison between Modern and Postmodern Architecture with an example	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.
Week-7	**Midterm Exam.**					
Week-8	Late-Modernism Architecture: Its language, criticism, methods, and principles. Assignment: Choosing and defining three buildings representing late modern architecture trends that have been explained.	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.
Week-9	Late-Modernism Architecture: Trends, Features, and Examples. Assignment: Mention examples of Late Modernism architecture in Egypt and analyze one of them.	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.
Week-10	Academic waiting lecture 2 - Quiz 2	2	1	2	0	LOs 1, LOs 2, LOs 3,
Week-11	Neo Modernism Architecture: Its language, criticism, methods, and principles. Assignment: Choosing and defining a building that represents Neo-Modernism Architecture.	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.
Week-12	Neo Modernism Architecture: Trends, Features, and Examples. Assignment: Choosing and defining a building that represents Neo-Modernism Architecture in Egypt.	2	1	2	0	LOs 2, LOs 4, LOs 5, LOs 6, LOs 7.
Week-13	**Final project**	2	1	2	0	LOs 1, LOs 2, LOs 3.
Week-14	**Final project Discussion**	2	1	2	0	LOs 1, LOs 2, LOs 3.
Week 15	**Final Exam.**					

5.3Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)						
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7
CLO 1	√	-	√	-	-	-	-
CLO 2	-	√	-	-	-	-	-
CLO 3	-	-	-	√	√	-	-
CLO 4	-	-	-	-	-	√	√

6- Assessment

6.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Written Exam	-	√	-	√	√	√	√
Online Exam	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-
Quiz	-	√	-	√	√	√	√
Lab Exam	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	-	-	-	-
Research Assignment	√	√	√	√	√	√	√
Reporting Assignment	-	-	-	-	-	-	-
Project Assignment	√	√	√	√	√	√	√
In-Class Questions	√	√	√	√	√	√	√

6.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*written*)	**20**	7th	60 min.
Tutorial and report assessment (*Term Work*)	**25**	weekly	Committee
Quizzes/reports/presentation (*Final project - Term Work*)	**15**	According to the schedule	Committee
Total Mark	**100**		

7- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

8- List of References:

10.1. Course Notes:

- Lecture notes pdf files on Microsoft Teams

10.2. Required Text Books and Additional References:

- Trubiano, F. (n.d.). (2022). Building Theories: Architecture as the Art of Building. United Kingdom: Taylor & Francis.
- Myerson, J., Ross, P. (2003). The 21st Century Office: Architecture and Design for the New Millennium. United Kingdom: Rizzoli.
- ريد ,هربرت وترجمة :خشبة , سامي , معني الفن , الهيئة المصرية العامة للكتاب – القاهرة 1998 ,
- على رأفت , ثلاثية الإبداع المعماري : الابداع الفني في العمارة , مركز أبحاث انتر كونسلت – القاهرة. 1997 ,

10.3. Recommended Books:

- Whilford , Frank , The World of Art , Hundson , 1984
- Neemat Ismael Alaam, Western Arts in the Middle Ages, Renaissance Age, and Baroque, Dar El-Maaref, Cairo, 1982.
- Salingaros, N. A., Mehaffy, M. W. (2006). A Theory of Architecture. Germany: Intercollegiate Studies Institute.

10.4. Web Sites: www.ekb.eg

Course Directors	Name	Signature
Teaching staff	**Dr. Omnia Monir**	
Course coordinator	**Dr. Omnia Monir**	
Program coordinator	**Dr. Mohamed Nabil El Sebai**	
HeadoftheDepartment	**prof. Esam Sayed Farg Khalifa**	
Dateofapproval		

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	
Course Specification	
ARE 216: Housing policies and design	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Housing policies and design			**Course Code:**		ARE 216	
Program / level	Architectural Engineering			**SENIOR** (1),(2)			
Term/ Academic year:	Oct.-Jan 2023 -2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	0
Pre-Requisite							
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- ✓ Identify the Housing definitions and explain the causes of the housing problem.
- ✓ Analyze the negative aspects of informal housing (Slums)
- ✓ Identify policies to deal with urban deteriorating areas
- ✓ Compare between housing patterns (types of houses) & categorize housing levels
- ✓ Apply the basics of housing unit design, and the stages of planning residential areas considering the economic aspect

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Define the human needs and Housing definitions

CLO 2. Explain various problems related to housing , analyze their causes, and identify policies to solve the housing problem

CLO 3. Explain and Apply the basics of housing unit design, housing quality standards, and assembly in residential areas considering the economic aspects

CLO 4. Compare between housing patterns (types of houses) & housing levels.

CLO 5. Define important laws related to Housing and Identify the stages of planning residential areas to achieve a suitable residential environment

*3- **Relationship between the course and the Competencies :***

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A2,A3,A4,A5,A6	B1,B2,B4

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING GRADUATE	A.2. 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	**LO 1.** explain various problems related to housing, analyze their causes, and find solutions to the problems **LO 2.** define the human needs and housing basics, housing patterns (types of houses) & housing levels.
	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	**LO 3**. Apply the basics of housing unit design, housing quality standards, and assembly in residential areas considering the economic aspects **LO 4**. evaluate students' ability to analyze the given data to extract results and apply them to the required exercises
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines,	**LO 5**. Measure the ability to activate self-learning

	health and safety requirements, environmental issues and risk management principles	strategies through group research,(research paper or electronic- PowerPoint presentations.+design).
	A.5. Practice research techniques and methods of investigation as an inherent part of learning.	**LO 6**. apply the evidence of planning and design work required by the design. in a way that meets the requirements of aesthetics and humanities, and is environmentally and culturally compatible
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements	**LO 7**. Identify the stages of planning residential areas to achieve a suitable residential environment and Define important laws related to Housing
COMPETENCIES of ARCHITECCTURAL ENGINEERING	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**LO 8.** analyze housing projects through goals, ideas, sketches and explanations **LO 9**. Produce designs for housing units and assembling residential buildings and Identify requirements and needs of users While achieving economic efficiency
	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 2.** define the human needs and housing basics, housing patterns (types of houses) & housing levels. **LO 4**. evaluate students' ability to analyze the given data to extract results and apply them to the required exercises **LO 9**. Produce designs for housing units and assembling residential buildings and Identify requirements and needs of users While achieving economic efficiency
	B.4Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	**LO 3**. Apply the basics of housing unit design, housing quality standards, and assembly in residential areas considering the economic aspects **LO 7**. Identify the stages of planning residential areas to achieve a suitable residential environment and Define

		important laws related to Housing

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

This course is designed to enable the students to understand the fundamental issues related to housing theory, housing problems in developing countries, housing market and housing economy, the physical and non-physical aspects that affect the design of housing projects for the urban poor, and alternative approaches to housing policies. The course explores the current issues affecting the formulation and implementation of housing programs in developing countries. It covers classification of housing types, analysis of housing design, and design procedure of housing projects

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	A general introduction, the concept of housing, and the causes of the population problem in Egypt	2	1	2	0	**LO 1, LO 2, LO3, LO4, LO 5**
Week-2	Studying the types of deteriorated urban areas, And policies to deal with it (focus on slum housing and negative aspects of it)					**LO 1, LO 2, LO3, LO4, LO 5**
Week3	Recommendations for the housing problem in Egypt + Suggested modification) (focus on presenting various housing projects) - Policies dealing with the housing problem and its most important axes,	2	1	2	0	**LO1, LO 2, LO3,LO4, LO 5**
Week4	Policies dealing with the housing problem and its most important axes Housing Levels in Egypt (focus on presenting various housing projects)	2	1	2	0	**LO1, LO 2, LO3, LO4, LO 5 , LO6**
Week5	types of housing + methods of assembling them (Housing classification and housing distribution models)	2	1	2	0	**LO1, LO 2, LO3, LO 5, LO8, LO9**
Week6	General Review+ Quiz	2	1	2	0	**LO1, LO3, LO4, LO8, LO6**

Week7	**`Midterm Exam**					
Week8	The foundations of housing unit design + A proposed work for design housing unit +	2	1	2	0	**LO3, LO4, LO 5, LO7, LO8, LO9**
Week 9	Residential Neighborhood and its Components + Basics of residential areas design					**LO3, LO4 LO 5 , LO6,LO8, LO9**
Week 10	The important laws related to Housing and calculating the area of residential lands					**LO1, LO3, LO4, LO7, LO8,, LO9,**
Week-11	foundations of residential area design	2	1	2	0	**LO1 LO3,, LO5, LO4, LO7, LO8,, LO9**
Week-12	Housing economics and Applying housing economics to housing models (Achieving a comfortable residential environment for those with reduced incomes)					**LO1, LO5, LO4, LO3, LO7, LO8,, LO9**
Week-13	principles of assembly and economy to the neighborhood +Review of recent housing projects	2	1	2	0	**LO1 LO3, LO4, LO7, LO8,**
Week-14	General Review					**LO1, LO 2, LO3, LO4, LO7, LO8, LO9**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	---------
2nd	----------	---------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
CLO 1	√		√		✓		✓		✓
CLO 2		√		✓				✓	✓

CLO 3	✓		✓		✓	√	✓		
CLO 4			√		✓	✓		✓	✓
CLO 5		✓				✓	✓	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	***Learning Outcome*(LOs)**								
	General							**ARE**	
	LO 1	**LO 2**	**LO 3**	**LO 4**	**LO 5**	**LO 6**	**LO 7**	**LO 8**	**LO 9**
Face-to-Face Lecture	✓	✓	✓	✓				✓	✓
Online Education	-	-	-	-	-	-	-	-	-
Tutorial/ Exercise	✓						√	✓	√
Group Discussion		✓		√	✓	✓		√	
Laboratory	-	-	-	-	-	-	-	-	-
Site Visit		✓					√		
Presentation		√	√			✓			✓
Mini Project		√	✓			✓		✓	✓
Research and Reporting	✓		✓	✓	✓	√			✓
Brain Storming		✓	√					√	√
Self-Learning					√				

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	***Learning Outcome*(LOs)**								
	LO 1	**LO 2**	**LO 3**	**LO 4**	**LO 5**	**LO 6**	**LO 7**	**LO 8**	**LO 9**
Written Exam	✓	√	✓	✓		√	√	✓	√
Online Exam									
Oral Exam									
Quiz	✓	✓							
Lab Exam									
Take-Home Exam									
Research Assignment	✓	√	√			✓	✓	√	
Reporting Assignment		✓		✓			✓		

Project Assignment	✓	√	✓			✓			
In-Class Questions	√	✓		√	✓	√		✓	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	8th	90 min.
Midterm written Exam (*Term Work*)	**20**	5th	60 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard

B- Projector

C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Recommended Books:

- تنمية التجمعات العمرانية الجديدة - مدخل تنموي لاستدامة الاسكان في العاصمة الادارية الجديدة لمصر: نسمة محمد عبد المقصود - رسالة دكتوراه- كلية الهندسة -جامعة الفيوم - 2019م
- مشكلة الإسكان في مصر : احمد خالد علام - وزارة الإسكان والمرافق العمرانية ، 2004 ، مبارك والعمران ، انجازات الحاضر لبناء المستقبل
- SHALABY, Heidi; AHMED, Nancy; ELSHANWANY, Hussien. The role of housing projects in Egypt toward solving the low-income housing problem. *The Egyptian International Journal of Engineering Sciences and Technology*, 2022, 40.1: 71-82.
- EVERHART, Stephen; HEYBEY, Berta; CARLETON, Patrick. Egypt: overview of the housing sector. *Housing Finance International*, 2006, 20.4: 9.

10.3. Web Sites:

- **http://www.mhuc.gov.eg/Home/Index**
- **http://www.newcities.gov.eg/about/projects/housing_projects/socialhousing/default.aspx**
- **https://books-library.net/free-162038697-download**
- **https://unhabitat.org/sites/default/files/2020/09/egypt_housing_strategy.pdf**

Course Directors	Name	Signature
Teaching staff	Dr. maysa selim	
Course coordinator	Dr. maysa selim	
Program coordinator	Dr.mohamed nabil	
Head of the Department	Prof. Esam Khalifa	
Date of approval	Oct.-Jan 2023 -2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 217 : Passive heating & cooling

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Passive heating & cooling			**Course Code:**		ARE 223	
Program / Level	Architectural Engineering			**SENIOR (1)**			
Term/ Academic year:	Oct.- Jan. 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	--
Pre-Requisite							
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Gain a comprehensive understanding of the characteristics and behavior of solar radiation concerning passive heating and cooling systems in architectural contexts.
- Critically evaluate the role of transparent surfaces, glasses, and building materials in influencing thermal regulation and comfort within architectural spaces.
- Analyze and comprehend the effects of wind directions on passive design strategies to achieve optimal temperature control and comfort within buildings.
- Develop an understanding of and implement thermal storage walls and roofs as essential components within sustainable architectural solutions for passive heating and cooling.
- Apply theoretical knowledge of direct gain and passive architectural design to practical applications to enhance energy efficiency and comfort in architectural spaces.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Analyze the characteristics of solar radiation and its relevance to passive heating and cooling systems.

CLO 2. Considering sustainability principles, evaluate the impact of transparent surfaces, glasses, and building materials on passive thermal regulation.

CLO 3. Assess the influence of wind directions on passive design strategies for efficient temperature control and comfort in architectural spaces.

CLO 4. Implement thermal storage walls and roofs as part of sustainable architectural solutions for passive heating and cooling.

CLO 5. Develop and apply direct gain and passive architectural design principles to optimize energy efficiency and comfort in buildings.

Communicate efficiently to convey ideas numerically and graphically.	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of Architectural Engineering
Program Academic Standards that the course contributes in achieving	A6,A7	B2, B3

3- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.6. Plan, supervise and monitor the implementation of engineering projects, taking into consideration other trades Requirements.	**LO1.** Understand Solar Radiation's Impact on Passive. **LO2**: Evaluate Material Influence on Thermal Comfort. **LO3:** Assess passive design strategies considering the influence of wind directions on energy-efficient architectural solutions. **LO4.** Implement thermal storage walls, roofs, and passive architectural designs for sustainable temperature control

		in buildings
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO1.** Understand Solar Radiation's Impact on Passive. **LO3:** Assess passive design strategies considering the influence of wind directions on energy-efficient architectural solutions.
COMPETENCIES of ARC	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO2**: Evaluate Material Influence on Thermal Comfort.
	B.3. Generate ecologically responsible, environmental conservation and rehabilitation designs through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO3:** Assess passive design strategies considering the influence of wind directions on energy-efficient architectural solutions. **LO4.** Implement thermal storage walls, roofs, and passive architectural designs for sustainable temperature control in buildings.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Characteristics of solar radiation, transparent surfaces and glasses, characteristics of building materials, effect of wind directions, passive designs, thermal storage walls, thermal storage roofs, direct gain and passive architectural design.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction of solar radiation	3	1	2	-	**LO1**
Week-2	Introduction of transparent surfaces and glasses	3	1	2	-	**LO2**

Week-3	Effect of solar radiation, transparent surfaces and glasses in building	3	1	2	-	**LO1, LO2**
Week-4	Characteristics of building materials	3	1	2	-	**LO2**
Week5	Effect of wind directions in building	3	1	2	-	**LO3**
Week-6	Introduction of Passive Designs Solutions	3	1	2	-	**LO3**
Week-7	Follow up for Passive design solutions	3	1	2	-	**LO3**
Week-8	**Midterm Exam.**					
Week-9	Thermal storage walls	3	1	2	-	**LO3**
Week-10	Thermal storage roofs	3	1	2	-	**LO4**
Week-11	Direct gain and passive architectural design	3	1	2	-	**LO1, LO4**
Week-12	Heating Equipment and Cooling equipment	3	1	2	-	**LO3**
Week-13	Revision	3	1	2	-	**LO1, LO2**
Week-14	Revision	3	1	2	-	**LO3, LO4**
Week 15	Final Exam					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and Los

Course Learning Objectives	Learning Outcomes (LOs)			
	LO 1	LO 2	LO 3	LO s4
CLO 1	✔			
CLO 2		✔		

CLO 3			✔	
CLO 4				✔
	✔	✔		

6- Matrix of Course Objective and LOs

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)			
	General		ARE	
	LO 1	LO 2	LO 3	LO 4
Face-to-Face Lecture	✓	✓	✓	✓
Online Education	–	–	–	–
Tutorial/ Exercise	✓	✓	✓	✓
Group Discussion	✓	✓	✓	–
Laboratory	–	–	–	–
Site Visit	–	–	–	–
Presentation	–	✓	–	–
Mini Project	✓	–	–	–
Research and Reporting	–	✓	✓	–
Brain Storming	✓	–		–
Self-Learning	✓	–	✓	–

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)			
	LO 1	LO 2	LO 3	LO 4
Written Exam	✔	✔	✔	✔
Online Exam	–	–	–	–

Oral Exam	–	–	–	–
Quiz	✔	✔	✔	–
Lab Exam	–	–	–	–
Take-Home Exam	–	–	✔	–
Research Assignment	✔	–	–	✔
Reporting Assignment	✔	✔	✔	
Project Assignment	–	✔	–	✔
In-Class Questions	✔	✔	–	✔

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- White Board
B- Laptop & Data show
C- Ms Teams
D- Internet

10- List of References:

10.1. Course Notes:

- Lecture notes Available (handed to students part by part).

10.2. Required Text Books and Additional References:

- Evans martin housing, climate and comfort architectural pass limited, london 1980

10.3. Recommended Books:

- Altan H, Hajibandeh M, Tabet Aoul K, Deep AK. Passive Design – 2017.
- Bainbridge DA, Haggard K. Passive Solar Architecture: Heating, Cooling, Ventilation, Daylighting, and More Using Natural Flows. Chelsea Green Publishing; 2022. ISBN 978-1603589082.
- Dixon JM. Heating, Cooling, Lighting: Sustainable Design Methods for Architects. 1991.
- Gonzalo R, Vallentin R. Passive House Design. Munich; 2014.
- Razaqpur AG, Fazio PA. Passive Heating and Cooling Approaches for Buildings: Principles and Applications. Springer; 2023. ISBN 978-3030932704.
- Santamouris M. Passive Cooling of Buildings. Routledge; 2021. ISBN 978-0367504265.

10.4. Web Sites:

- Passive House Institute. [https://www.passivehouse-international.org/].
- American Solar Energy Society (ASES). [https://www.ases.org/].
- Building Green. [https://www.buildinggreen.com/].
- EKB (Egyptian Knowledge Bank)
- https://www.sunearthtools.com/

Course Directors	Name	Signature
Teaching staff		
Course coordinator	Dr. Ghada Assal	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	Prof. Essam Khalifa	

Date of approv	Oct.- Jan. (2023 – 2024)

al	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 218 : Solar Energy Utilization

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Solar Energy Utilization			**Course Code:**		ARE 218	
Program / Level	Architectural Engineering			**SENIOR (1)**			
Term/ Academic year:	Oct.- Jan. 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	--
Pre-Requisite							
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Understand the characteristics and behaviour of solar radiation concerning heat gain, daylighting, and energy in architectural contexts.
- Evaluate the role of transparent surfaces, glasses, and building materials in influencing thermal regulation and comfort within architectural spaces.
- Analyze and comprehend the solar energy utilization strategies to achieve maximum benefit of the renewable energy within buildings.
- Conduct solar energy calculations taking building energy codes in consideration and explore its role in sustainability rating systems.
- Apply theoretical knowledge of Solar radiation and energy to practical applications to enhance energy efficiency and comfort in architectural spaces.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Analyze the characteristics of solar radiation concerning heat gain, daylighting, and energy in architectural contexts.

CLO 2. Considering sustainability principles, evaluate the impact of transparent surfaces, glasses, and building materials on passive thermal regulation.

CLO 3. Assess the solar energy utilization strategies to achieve maximum benefit of the renewable energy within buildings.

CLO 4. Calculate solar energy measurements taking building energy codes in consideration and explore its role in sustainability rating systems.

CLO 5. Develop and apply Solar radiation and energy to practical applications to enhance energy efficiency and renewable energy production in architectural building.

Communicate efficiently to convey ideas numerically and graphically.	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of Architectural Engineering
Program Academic Standards that the course contributes in achieving	A6,A7	B2, B3

3- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.6. Plan, supervise and monitor the implementation of engineering projects, taking into consideration other trades Requirements.	**LO1.** Understand the characteristics of solar radiation in architectural contexts. **LO2**: Evaluate the impact of transparent surfaces, glasses, and building materials on heat gain and energy production **LO3:** Assess solar energy utilization strategies to achieve maximum benefit of the renewable energy within buildings.

		LO4. Conduct solar energy measurments taking building energy codes in consideration and explore its role in sustainability rating systems
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO1.** Understand the characteristics of solar radiation in architectural contexts. **LO3:** Assess solar energy utilization strategies to achieve maximum benefit of the renewable energy within buildings.
COMPETENCIES of ARC	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO2**: Evaluate the impact of transparent surfaces, glasses, and building materials on heat gain and energy production **LO5:** Develop and apply Solar radiation and energy to practical applications to enhance energy efficiency and renewable energy production in architectural building
	B.3. Generate ecologically responsible, environmental conservation and rehabilitation designs through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO3:** Assess solar energy utilization strategies to achieve maximum benefit of the renewable energy within buildings. **LO4.** Conduct solar energy measurments taking building energy codes in consideration and explore its role in sustainability rating systems

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Characteristics of solar radiation, transparent surfaces and glasses, characteristics of building materials, effect of wind directions, passive designs, thermal storage walls, thermal storage roofs, direct gain and passive architectural design.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction of solar radiation	3	1	2	-	**LO1**
Week-2	Introduction of transparent surfaces, glasses, and building materials	3	1	2	-	**LO2**
Week-3	Effect of solar radiation, transparent surfaces and glasses in building	3	1	2	-	**LO1, LO2**
Week-4	Difference between passive and active and interactive buildings	3	1	2	-	**LO1, LO2**
Week5	**QUIZ (1)**	3	1	2	-	**LO1, LO2,**
Week-6	Solar energy utilization strategies	3	1	2	-	**LO3**
Week-7	Classifications and assessment of solar energy utilization strategies	3	1	2	-	**LO3**
Week-8	**Midterm Exam.**					
Week-9	Solar energy measurements taking building energy codes in consideration	3	1	2	-	**LO4**
Week-10	Solar energy measurements taking building energy codes in consideration	3	1	2	-	**LO4**
Week-11	Develop solar radiation and energy in simulation software	3	1	2	-	**LO1, LO4**
Week-12	**QUIZ (2)**	3	1	2	-	**LO3,LO4, LO5**
Week-13	Develop solar radiation and energy in simulation software	3	1	2	-	**LO4, LO5**
Week-14	Revision	3	1	2	-	**LO3, LO4,LO5**
Week 15	Final Exam					

5.3. Experiment Topics:

Serial	**Experiment**	**Laboratory hrs.**
1st	NA	
2nd		

6- Matrix of Course Objective and Los

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)				
	LO 1	LO 2	LO 3	LO 4	LO 5
CLO 1	✔				
CLO 2		✔			
CLO 3			✔		
CLO 4				✔	✔
CLO 5	✔	✔			✔

7- Course Teaching and Learning Methods:

Teaching and Learning Methods		*Learning Outcome*(LOs)			
	General		ARE		
	LO 1	LO 2	LO 3	LO 4	LO 5
Face-to-Face Lecture	✓	✓	✓	✓	✓
Online Education	–	–	–	–	–
Tutorial/ Exercise	✓	✓	✓	✓	✓
Group Discussion	✓	✓	✓	–	–
Laboratory	–	–	–	–	–
Site Visit	–	–	–	–	–
Presentation	–	✓	–	–	✓
Mini Project	✓	–	–	–	–
Research and Reporting	–	✓	✓	–	–
Brain Storming	✓	–		–	–
Self-Learning	✓	–	✓	–	✓

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)				
	LO 1	LO 2	LO 3	LO 4	LO 5
Written Exam	✔	✔	✔	✔	✔
Online Exam	–	–	–	–	–
Oral Exam	–	–	–	–	–
Quiz	✔	✔	✔	✔	✔
Lab Exam	–	–	–	–	–
Take-Home Exam	–	–	✔	–	–
Research Assignment	✔	–	–	✔	✔
Reporting Assignment	✔	✔	✔	–	–
Project Assignment	–	✔	–	✔	✔
In-Class Questions	✔	✔	–	✔	✔

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- White Board
B- Laptop & Data show

C- Ms Teams
D- Internet
E- Simulation Software

10- List of References:

10.1. Course Notes:

- Lecture notes Available (handed to students part by part).

10.2. Required Text Books and Additional References:

- Evans martin housing, climate and comfort architectural pass limited, london 1980
- Dickinson, E. W. *Solar energy technology handbook*. CRC Press, 2018.

10.3. Recommended Books:

- Bainbridge DA, Haggard K. Passive Solar Architecture: Heating, Cooling, Ventilation, Daylighting, and More Using Natural Flows. Chelsea Green Publishing; 2022. ISBN 978-1603589082.
- Dixon JM. Heating, Cooling, Lighting: Sustainable Design Methods for Architects. 1991.
- Sick, Friedrich. *Photovoltaics in Buildings: A Design Handbook for Architects and Engineers*. Routledge, 2014.
- Prasad, Deo, and Mark Snow. *Designing with solar power: a source book for building integrated photovoltaics (BiPV)*. Routledge, 2014.
- Yap, Eng Hwa, ed. *Energy Efficient Buildings*. BoD–Books on Demand, 2017.
-

10.4. Web Sites:

- Passive House Institute. [https://www.passivehouse-international.org/].
- American Solar Energy Society (ASES). [https://www.ases.org/].
- Building Green. [https://www.buildinggreen.com/].
- EKB (Egyptian Knowledge Bank)
- https://www.sunearthtools.com/

Course Directors	Name	Signature
Teaching staff		
Course coordinator	**Dr. Ghada Assal**	
Program coordinator	**Dr. Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Essam Said Farag Khalifa**	

Date of approval	**OCT-JAN. (2023 – 2024)**

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	
Course Specification	
ARE 219: Landscaping	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Landscaping			**Course Code:**		ARE 219	
Program /level	Architectural Engineering			**SENIOR (1),(2)**			
Term/ Academic year:	Oct.-Jan. 2023 – 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	0
Pre-Requisite	----						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Integrating comprehensive knowledge in the formulation of objectives and project innovation.
- Use of analytical tools during specialized procedures.
- Innovative and appropriate solutions for landscaping.
- Enhancing communication within the project teams.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1. Explain landscaping science in all its aspects.

CLO 2. Define general programs and functional relations for landscaping projects.

CLO 3. Produce projects for landscaping and green and open areas.

CLO 4. Measure innovative thinking in solving problems and making designs.

CLO 5. Apply the evidence of planning and design work required by the design

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A3 ,A5,A9	B2,B3

4- *Mapping Course Los to NARS*

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 1.** Apply the evidence of planning and design work required by the design.. **LO 2.** Categorize green areas and identifies their character and styles. **LO 3.** Identify the overall program and functional relationships of landscaping projects.

	A.5. Practice research techniques and methods of investigation as an inherent part of learning.	**LO 3.** Identify the overall program and functional relationships of landscaping projects. **LO 4.** Measure the ability to collaborate effectively within the teamwork, positive communication, presentations and presentations, and leads and motivate the work team
	. A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO 5.** Apply innovative thinking in problem solving, and in designing products, systems, components and processes.
COMPETENCIES of ARCHITECCTURAL ENGINEERING	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 1.** Apply the evidence of planning and design work required by the design.. **LO 3.** Identify the overall program and functional relationships of landscaping projects. **LO 6.** Define the symbols and terminology used in landscaping. **LO 7.** Describe five types of each of (plants - paving materials - site constructions). **LO 8.** Design landscaping projects, green and open areas.
	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with	**LO 3.** Identify the overall program and functional relationships of landscaping projects.

	building designs.	**LO 8.** Design landscaping projects, green and open areas.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	Total Hours	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	- **Introductory Lecture.** - **General introduction to the curriculum**	3	1	2	0	**LO 2, LO 4, LO 6**
Week-2	- **Introduction and definition of the science of landscaping** - **Research (1) on symbols and terms used in landscaping.**	3	1	2	0	**LO 2, LO 4, LO 6**
Week-3	- **The History of Landscaping and Site Design (Gardens in Antiquity)** - **Research (2) Classification of basic components soft + hard scape**	3	1	2	0	**LO 2, LO 4**
Week-4	- **The History of Landscaping and Site Design (Gardens in the Middle Ages)**	3	1	2	0	**LO 2, LO 7**
Week5	- **The history of landscaping and site design (gardens in the modern era)** - **Research (3) Analysis of an existing garden inside or outside Egypt**	3	1	2	0	**LO 7**
Week-6	- **Site analysis** - **Planning and design of green areas**	3	1	2	0	**LO 3, LO 8**
Week-7	- **The basic elements in site coordination** - **A project to design the district garden in a new city+ Acceptance of the project program + site analysis**	3	1	2	0	**LO 1, LO 4**
Week-8	**Midterm Exam.**					
Week-9	- **Plants in landscaping the site** - **Functional relationships + alternatives to design ideas** - Determining the general program of the project and functional relations and design idea for the garden.	3	1	2	0	**LO 3, LO 5**
Week-10	- **Trees in landscaping** - **Design development and follow-up** - **Develop the design and putting the detailed elements**.	3	1	2	0	**LO 5, LO 8**

Week-11	- **Steps to make a design for a website coordination project** - **Develop the design and putting the detailed elements.**	3	1	2	0	**LO 5, LO 8**
	- **General review with application to the project** - **Design development and follow-up**					
Week-12	**Final follow-up of the project**	3	1	2	0	**LO 1, LO 3, LO 5, LO 8**
Week-13	Final project **Project delivery and arbitration**	3	1	2	0	**LO 1, LO 3, LO 5, LO 8**
Week-14	Revision.	3	1	2	0	**LO 2, LO 6, LO 7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	------
2nd	----------	------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO 1		√				√	√	
CLO 2	√	√	√					
CLO 3	√	√	√					√
CLO 4					√			√
CLO 5				√				

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)							
	Architectural Engineering							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture						√		
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	√		√	√	√			√
Group Discussion		√		√	√	√		
Laboratory	-	-	-	-	-	-	-	-
Site Visit				√				
Presentation	√	√		√	√	√	√	
Mini Project	√		√		√			√
Research and Reporting	√	√	√	√		√	√	
Brain Storming		√	√	√	√			√
Self-Learning	-	-	-	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√		√	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√		√		√	√		√
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	-	-	-	-	-
Research Assignment	√	√	√	√		√	√	
Reporting Assignment	√	√	√	√		√	√	
Project Assignment	√		√		√	√		√
In-Class Questions	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**15**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**25**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- علي ابراهيم البلقاسي; محمد. التطور التكنولوجي ودوره في تطوير مجال اللاند سكيب. 2022.
- عمارة اللاندسكيب في مصر - عمارة اللاندسكيب ودور النباتات في تصميم حديقة الأزهر - ليلى السيد المصري – مكتبة الشروق الدولية – القاهرة 2014.
- عمارة اللاندسكيب في مصر - مرجع نباتات حديقة الأزهر ومدينة القاهرة - ليلى السيد المصري – مكتبة الشروق الدولية – القاهرة 2014.
- مقدمة في تخطيط وتصميم المناطق الخضراء وفراغات البيئة العامة في المدن – أ.د/ عبد الحميد عبد الواحد – مكتبة دار المعرفة – القاهرة 1995.

10.3. Recommended Books:

- AŞILIOĞLU, Fatma. Sustainable landscape design in contemporary residential gardens. Environmental Sustainability and Landscape Management, 2016.
- BECK, Travis. Principles of ecological landscape design. Island Press, 2013.
- Leonard Hopper, Landscape Architectural Graphic Standards, John Wiley and sons, 2015.

- Norman K. Booth, Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design, John Wiley and sons, 2011.
- Clouston, B. (Ed.). (2013). Landscape design with plants. Newnes.
- Jamas A., Jr LaGro, Site Analysis : A Conceptual Approach To Sustainable Land Planning and Site Design, Wily i2nd (November2007).
- John Ormsbee Simonds, Barry Strake, Landscape Architecture, McGraw Hill Professional, 2006 4th Edition.
- Donald Watson, Time Saver Standard for Urban Design, McGraw Hill Professional, 2003 1st Edition
- Jon Long, Urban Design: A Typology of Procedures and Products, Architectural Press, 2005 1st Edition
- Norman K. Booth, Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design, John Wiley and sons, 2011.
- Leonard Hopper, Landscape Architectural Graphic Standards, John Wiley and sons, 2015.
- John Simonds, Landscape Arcitecture, McGraw-Hill Professional Publishing, 2006

10.4. Web Sites:

- Information Hub for Landscape Architecture, Design and Planning: http://www.lih.gre.ac.uk Garden and Landscape guide: http://www.gardenvisit.com

Course Directors	Name	Signature
Teaching staff	Ass.Prof. Asmaa Mostafa ELshamy	
Course coordinator	Dr. maysa selim	
Program coordinator	Dr.mohamed nabil	
Head of the Department	Prof. Esam Khalifa	
Date of approval	Oct.-Jan. 2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 221: Architectural Design 2

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Architectural Design (B)			**Course Code:**		ARE 221	
Program /Level	Architectural Engineering			**Senior (1)**			
Term/ Academic year:	Oct /Jan. 2023 - 2024			**Credit Hours:**		3	
Tutorial:	6	**Laboratories:**	0	**Tutorial:**	6	**Laboratories:**	0
Pre-Requisite	ARE 211						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Gain a comprehensive understanding of museum design principles and practices.
- Develop the ability to synthesize cultural, historical, and programmatic elements into architectural design.
- Cultivate creative problem-solving skills in architectural design.
- Explore sustainable design strategies and their integration into museum architecture.
- Effectively communicate design concepts through drawings, models, and presentations.
- Collaborate with peers in a multidisciplinary design environment.
- Apply architectural and interior design principles to create a functional and aesthetically pleasing space.
- A study of the site's content and analysis of site planning elements.
- Study of structural coordination and construction technology.
- Study the relationship between internal and external spaces.
- An introduction to structural expressions in architecture.
- Study the daylighting and zone ordination.

2- Course Learning Objectives (CLO):

At the end of this course, students should be able to :

CLO 1. Program analysis and technical studies.

CLO 2. Site planning analysis.

CLO 3. Using design concept as a keyword for developing and ruling the design

CLO 4. Creative and innovative thinking in solving problems and making designs.

CLO 5. Study Structural systems for extensive spans and open spaces.

CLO 6. Use natural daylighting for illumination and circulation in museums.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard(NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	**A2, A6, A7, A8**	**B1, B2, B3**

4- *Mapping Course Los to NARS*

Field	Program(CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**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: Apply innovative problem-solving in design contexts. LO4: Utilize creative three-dimensional exploration in design concepts. LO6: Select and assess appropriate tools for engineering challenges.
	A.6. Plan, supervise and monitor the implementation of engineering projects, taking into consideration other trades Requirements.	LO7: Execute specialized architectural designs for components and systems. LO9: Apply architectural design principles effectively.
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	LO2: Synthesize diverse perspectives and knowledge from multiple sources. LO5: Evaluate and merge diverse insights from varied sources.

	A.8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary Tools.	LO3: Engage in lifelong learning by consistently seeking out new information LO4: Utilize creative three-dimensional exploration in design concepts. LO8: Anticipate aesthetics and precision in design approaches.
COMPETENCIES of ARE	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	LO7: Execute specialized architectural designs for components and systems. LO8: Anticipate aesthetics and precision in design approaches. LO9: Apply architectural design principles effectively.
	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	LO1: Apply innovative problem-solving in design contexts. LO3: Engage in lifelong learning by consistently seeking out new information LO9: Apply architectural design principles effectively.
	B.3. Generate ecologically responsible, environmental conservation and rehabilitation designs through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	LO6: Select and assess appropriate tools for engineering challenges. LO9: Apply architectural design principles effectively.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

With an emphasis on space experience and interior design, this course focuses on the Continuation of design with projects of increasing complexity of form and functions, existing historical. Architectural design is a creative operation to solve the functional problems of buildings. Collection of information, analysis studies. The integration of structural and mechanical systems using intermediate and large space structures. Consideration is taken to the relation between internal and external space. Study of interior design, activity analysis, furniture, and lighting. Studio work, including lecture projects and interior and exterior perspectives. Design projects such as community and hotel buildings, art and museum complexes, educational parks, and medical centres. Considerations of urban context, structural coordination and environmental aspects will be studied and analysed. Computer use is essential in this course.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week-1	General introduction to the project + research InDesign standards for public Museums Assignment: Project Research	6	0	6	0	**LO1, LO2, LO3**
Week-2	Site analysis lecture (Building on specific land) Assignment: Site Visit	6	0	6	0	**LO1, LO3, LO4, LO5**
Week-3	What is Concept, and from where shall we start? Brainstorming for Concept Grand Museum Visit + Studying Maquette	6	0	6	0	**LO1, LO9**
Week-4	Reviewing - Studying Maquette	6	0	6	0	**LO1, LO2, LO3, LO4, LO9**
Week5	Reviewing - **Quiz1**	6	0	6	0	**LO5, LO6, LO7**
Week-6	Presentation of the project (First stage)	6	0	6	0	**LO3, LO8**
Week-7	Master plan and landscape	6	0	6	0	**LO8**
Week-8	**Midterm Exam.**					
Week-9	Plans reviewing	6	0	6	0	**LO4**
Week-10	Elevation mood board	6	0	6	0	**LO9**
Week-11	Sections reviewing	6	0	6	0	**LO9**
Week-12	Project reviewing	6	0	6	0	**LO8**
Week-13	Presentation of the project (semi-final)	6	0	6	0	**LO4, LO8**
Week-14	Final Submission	6	0	6	0	**LO3, LO4, LO8**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objectives and Los

Course Learning Objectives	Learning Outcomes (LOs)								
	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9
CLO 1		√					√		
CLO 2	√			√					
CLO 3									√
CLO 4	√			√					
CLO 5						√		√	√
CLO 6			√		√				

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	General				ARE		
	A2	A6	A7	A8	B1	B2	B3
	LO1 , LO4, LO 6	LO7, LO9	LO2, LO5	LO3, LO4, LO8	LO7toLO9	LO1, LO3, LO9	LO6, LO9
Face-to-Face Lecture	√	√		√	√	√	√
Online Education							
Tutorial/ Exercise	√	√	√			√	√
Group Discussion	√		√	√			
Laboratory							
Site Visit			√			√	
Presentation		√	√		√		
Mini Project	√	√		√		√	√
Research and Reporting		√	√			√	√
Brain Storming	√		√				
Self-Learning	√		√	√			

8- Assessment

- Project Research
- Site Visit
- Study model
- Home Design Assignment

8.1. Course Assessment Methods:

Assessment Methods	***Learning Outcome*(LOs)**						
	General				**ARE**		
	A2	**A6**	**A7**	**A8**	**B1**	**B2**	**B3**
	LO1 , LO4, LO 6	**LO7, LO9**	**LO2, LO5**	**LO3, LO4, LO8**	**LO7toLO9**	**LO1, LO3, LO9**	**LO6, LO9**
Written Exam	√			√		√	
Online Exam							
Oral Exam							
Quiz		√	√	√	√	√	
Lab Exam							
Take-Home Exam							
Research Assignment		√	√			√	√
Reporting							
Assignment							
Project Assignment	√	√	√	√	√	√	√
In-Class Questions							

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**20**	14th	Committee
Tutorial and report assessment (*Term Work*)	**15**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**5**	5th	90 min.
Total Mark	**100**		

9- Facilities Required:

A- Seminar room, workshop room and drawing studio
B- laptop and Data show for presentation
C- Lecture hall
D- Architectural software programs, AutoCad, 3Dmax, Photoshop, etc.

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- **Neufert, Ernst, Neufert, Peter. 2012. Neufert Architects' Data, Fourth Edition. Published by Wiley-Blackwell.**

10.3. Recommended Books:

- ابو عوف،طارق. 2014. تحليل الموقع. مؤسسة سكاي للكتاب
- ابو عوف،طارق. 2015. المبدأ التصميمي. مؤسسة سكاي للكتاب

1. Hooper-Greenhill, E. (2018). Museums and the Interpretation of Visual Culture (3rd ed.). New York: Routledge.
2. Falk, J.H., & Dierking, L.D. (2013). The Museum Experience Revisited. Walnut Creek, CA: Left Coast Press.
3. Scott, C.A. (2019). Museum Buildings: A Design Manual. Basel: Birkhäuser.
4. Anderson, G. (2016). Reinventing the Museum: The Evolving Conversation on the Paradigm Shift. New York: AltaMira Press.
5. Gutschow, N. (2020). Museum Architecture: A New Biography. New Haven: Yale University Press.

For creating concepts:

1. White, E. (2017). Art and Design Concepts. London: Bloomsbury Visual Arts.
2. Lawson, B. (2013). How Designers Think: The Design Process Demystified (5th ed.). Oxford: Architectural Press.
3. Ambrose, G., & Harris, P. (2015). Basics Design: Design Thinking. London: Bloomsbury Visual Arts.
4. Berger, J. (2013). Ways of Seeing. London: Penguin Classics.
5. Martin, R. (2009). The Design of Business: Why Design Thinking is the Next Competitive Advantage. Boston, MA: Harvard Business Review Press.

10.4. Web Sites:

- Foster + Partners. Available at: https://www.fosterandpartners.com/
- Sagrada Família. Available at: http://www.sagradafamilia.org/en/
- SkyscraperCity. Available at: https://www.skyscrapercity.com/
- American Society of Landscape Architects (ASLA). Available at: https://www.asla.org/

- Egyptian Knowledge Bank. Available at: http://www.ekb.eg/ar
- Architect Magazine. Available at: http://www.architectmagazine.com/

Course Directors	Name	Signature
Teaching staff	**Dr. Ghada Assal**	
Course coordinator	**Dr. Ghada Assal**	
Program Coordinator	**Dr. Mohamed Elsebaay**	
Head of the Department	**Prof. Esam Khalifa**	
Date of approval		

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 222: Reinforced Concrete and Foundations

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Reinforced Concrete and Foundations			**Course Code:**		ARE 222	
Program /level	Architectural Engineering			**SENIOR (1)**			
Term/ Academic year:	oct -Jan 2023 – 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	1	**Tutorial:**	0	**Laboratories:**	3
Pre-Requisite	ARE 212						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Integrate comprehensive knowledge in the formulation of objectives and project innovation in the reinforced concrete and foundations.
- Use of analytical tools during specialized procedures.
- Identify innovative and appropriate solutions for reinforced concrete and foundations.
- Enhance communication within the project teams.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1. Establish knowledge of reinforced concrete and foundations according to Egyptian code.

CLO 2. Conduct general programs and functional relations for reinforced concrete projects.

CLO 3. Produce projects for reinforced concrete and foundations.

CLO 4. Develop creative and innovative thinking in solving problems and making designs.

CLO 5. Acquire effective cooperation within the project work teams.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A1, A2, A7	B3

4- Mapping Course Los to NARS

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**A1.** Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO 1. Proficient in the use of materials and design work Required by the structures. LO 2. Classifies sections and identifies their character and System.
	A2. Develop and conduct appropriate Experimentation and/or simulation, analyses and objective engineering judgment to draw conclusions.	LO 3. Determines the overall Functional relationships between type of concrete element in the projects.

	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams	LO 4. Collaborates effectively within the team work, positive communication, presentations and leads and motivates the work team.
COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B3.** Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.	LO 1. Proficient in the use of materials and design work required by the structures. LO 3. Determines the overall Functional relationships Between type of concrete Element in the projects. **LO 6.** Defines the symbols and Terminology used in the reinforced concrete and foundations designs. LO 7. He mentions two types of each of (grade of steel - concrete materials - method of constructions). **LO8.** Designs reinforced Concrete and foundations projects, according to specifications .

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Design of short columns under centric loads. Design of Reinforced concrete shallow foundations, Design of simple and continuous girders, Design of concrete frames. Concrete dimensions of big halls using arches and shells.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction	4	1	0	3	**LO 2, LO 4, LO 6**
Week-2	Design Methods and Requirements	4	1	0	3	**LO 2, LO 4, LO 6**
Week-3	Characteristic Loads.	4	1	0	3	**LO 2, LO 4**
Week-4	Structural element and loads on structures.	4	1	0	3	**LO 2, LO 7**
Week5	Principles of the elastic design methods	4	1	0	3	**LO 7**
Week-6	Analysis and design of rectangular sections in bending	4	1	0	3	**LO 3, LO 8**
Week-7	Analysis and design of rectangular sections in bending	4	1	0	3	**LO 1, LO 4**
Week-8	**Midterm Exam.**					
Week-9	Analysis and design of T - sections in bending	4	1	0	3	**LO 3, LO 5**
Week-10	Analysis and design of T - sections in bending	4	1	0	3	**LO 5, LO 8**

Week-11	Analysis and design of Reinforced concrete solid slab.	4	1	0	3	**LO 5, LO 8**
Week-12	**Quiz**	4	1	0	3	**LO 1, LO 3, LO 5, LO 8**
Week-13	Analysis and design of Reinforced concrete solid slab.	4	1	0	3	**LO 1, LO 3, LO 5, LO 8**
Week-14	Revision.	4	1	0	3	**LO 2, LO 6, LO 7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	------
2nd	----------	------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO 1		√				√	√	
CLO 2	√	√	√					
CLO 3	√	√	√					√
CLO 4					√			√
CLO 5				√				

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs) Architectural Engineering							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√	√	√	√	√	√	√	
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	√		√	√	√			√
Group Discussion		√		√	√	√		
Laboratory	-	-	-	-	-	-	-	-
Site Visit				√				
Presentation	√	√		√	√	√	√	
Mini Project	√		√		√			√
Research and Reporting	√	√	√	√		√	√	
Brain Storming		√	√	√	√			√
Self-Learning	-	-	-	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√		√	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√		√		√	√		√
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	√	√	√	√	√	√	√	√
Research Assignment	√	√	√	√		√	√	
Reporting Assignment	√	√	√	√		√	√	
Project Assignment	√		√		√	√		√
In-Class Questions	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	-	---
End of term Oral exam	**-**	-	---
Tutorial and report assessment (*Term Work*)	**30**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**10**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Wang, Samon and Pincheira< Reinforced Concrete Design< John Wile & Sons, 7th Ed., 2007.
- Introduclion of Reinforced Concrete (R.C) Dr. Yasser El-Leathy,2020.
- DESIGN OF REINFORCED CONCRETE STRUCTURES, Mashhour Ghoneim Mahmoud EbMihilmy, Second Edition, Volume 2,2019

10.3. Recommended Books:

- REINFORCED CONCRETE DESIGN HANDBOOK, PROF.DR.SHAKER EL BEHAIRY FACULTY OF ENGINEERING AIN SHAMS UNIVERSITY SIXTH EDITION,2021(https://m.facebook.com/105706734818958/photos/a.110707957652169/110707940985504/).

Course Directors	Name	Signature
Teaching staff	**Dr. Mohamed Ahmed Gomaa**	
Course coordinator	**Dr. Mohamed Nabil El Sebai**	
Program coordinator	**Dr. Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Essam Said Khalifa**	
Date of approval	**OCT -JAN (2023 – 2024)**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	
Course Specification	
ARE 223 : Urban Design In New Towns	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	: Urban Design In New Towns			**Course Code:**		ARE 223	
Program / level	Architectural Engineering			**SENIOR(1)**			
Term/ Academic year:	Oct -Jan 2023 – 2024			**Credit Hours:**		3	
Contact Hours:	6	**Lecture:**	0	**Tutorial:**	6	**Laboratories:**	0
Pre-Requisite							
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Incorporate knowledge of urban design into the formulation of objectives and the creation of projects.
- Use of analytical tools during specialized procedures.
- Create innovative and appropriate solutions to urban design problems.
- Enhance communication within project teams.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Establish knowledge of urban design in all its aspects.

CLO 2. Conduct a SWOT Analysis

CLO 3. Formulate objectives and strategies, formulate alternatives, and proposal projects.

CLO 4. Produce urban design and design projects for new and existing sites.

CLO 5. Develop creative and innovative thinking in problem solving and design work.

CLO 6. Establish effective collaboration within project teams.

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*3- **Relationship between the course and the Competencies :***

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARC
Program Academic Standards that the course contributes in achieving	A3,A4,A6,A7,	B1,B2,B4

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.3. 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** .Learn the principles and Architectural Design Basics Learn about interactions between the environment and the urban, social and economic aspects.
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 2.** Proficient in creative and innovative thinking in problem solving, and in designing products, systems, components and processes
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO 2.** Proficient in creative and innovative thinking in problem solving, and in designing products, systems, components and processes

	A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 3**. Collaborates effectively within the team work, positive communication, presentations and presentations, and leads and motivates the work team. LO 4. Organizes tasks and resources efficiently
COMPETENCIES of ARC	B1. Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies and human sciences.	**LO 6**. Mastering Analytics **LO 7.** Formulates goals strategies and models alternatives, determines the basis and evaluation criteria for Choose the optimal alternative. **LO 8**. Amrani implements And design work for the new and sites in mind Legislation and construction requirements.
	B2. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	LO 9. Proficient in the use of evidence of planning and design work required by the design.
	B.4Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	LO 8. Amrani implements And design work for the new and sites in mind Legislation and construction requirements.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The course introduces three main aspects of urban design: the elements of urban design: the elements of urban design (nodes, paths, public spaces, etc.); the levels of perception (user, analyzer, critic & designer perceptions); the elements of analysis & design of urban spaces (components, activates, forms, materials, colors, characteristics, style). Applications on new communities.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction to course , definitions of terms , urban space , new towns , the relation between (mass and space) , key actors (user , designer , urbanism)	3	0	6	0	LO 1
Week-2	Introduction to course , definitions of terms , urban space , new towns , the relation between (mass and space) , key actors (user , designer , urbanism)	3	0	6	0	LO 2
Week-3	"The image of the city" – analytical studies of certain place, field studies + project + application	3	0	6	0	LO 2
Week-4	Elements of urban design (structure and form) of land marks and nodes, application	3	0	6	0	LO 6, LO 9
Week5	A analytical project for an existing urban space + application + project	3	0	6	0	LO 7
Week-6	Project follow up	3	0	6	0	LO 3, LO 7
Week-7	Application and presentation of project + jury	3	0	6	0	LO5, LO 6, LO 7, LO 8
Week-8	**Midterm Exam.**					
Week-9	**Quiz exam** Follow up the project					
Week-10	New project: application (urban design project in	3	0	6	0	LO3, LO 6, LO 9

	a new town)					
Week-11	Application (urban design project in a new town) + exercise 3	3	0	6	0	LO 7, LO 8
Week-12	Application (urban design project in a new town) review	3	0	6	0	LO 8
Week-13	Application (urban design project in a new town) review	3	0	6	0	LO5, LO 6, LO 7, LO 8
Week-14	Presentation, project hand in	3	0	6	0	LO5, LO 6, LO 7, LO 8
Week 15	**Final Exam.**					

5.3. Experiment Topics: (not applicated)

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8	LO9
CLO 1	✔								
CLO 2						✔			
CLO 3						✔	✔		
CLO 4		✔						✔	
CLO 5					✔				✔
CLO 6			✔	✔					

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)								
	General	ARC							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Face-to-Face Lecture	✔								
Online Education									
Tutorial/ Exercise			✔		✔	✔	✔	✔	✔
Group Discussion			✔						
Laboratory									
Site Visit			✔						
Presentation		✔	✔						
Mini Project			✔		✔	✔	✔	✔	✔
Research and Reporting			✔	✔					
Brain Storming	✔					✔	✔	✔	
Self-Learning									

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Written Exam	✔	✔		✔	✔	✔	✔	✔	✔
Online Exam									
Oral Exam									
Quiz					✔	✔	✔	✔	
Lab Exam									
Take-Home Exam	✔	✔	✔	✔	✔	✔	✔	✔	✔
Research Assignment					✔				✔
Reporting Assignment					✔	✔	✔	✔	
Project Assignment					✔	✔	✔	✔	
In-Class Questions	✔	✔	✔	✔	✔	✔	✔	✔	✔

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	90 min.
Midterm written Exam (*Term Work*)	**30**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**20**	weekly	-
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	-
Total Mark	**100**	**15th**	

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Available (handed to students part by part).

10.2. Required Text Books and Additional References:

- Architecture: Form, Space, and Order 3rd Edition by Francis D. K. Ching (Author),2007, ISBN-13 0471752165, Publisher,John Wiley & Sons
- Kevin Lynch , the image of the city < Cambridge 1970, ISBN 0 262 12004 6

10.3. Recommended Books:

- Christopher Alexander , A pattern language ,1977, ISBN-13 **978-0195019193,** Publisher **Oxford University Press**

10.4. Web Sites:

- http://www.urbanpolicy.berkeley.edu; http://www.cih.org

- http://www.wikipdia.com

Course Directors	Name	Signature
Teaching staff	**Dr.Mohamed Nabil El Sebai**	
Course coordinator	**Dr.Mohamed Nabil El Sebai**	
Program coordinator	**Dr.Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Essam Said Farag Khalifa**	
Date of approval	**OCT-JAN (2023 – 2024)**	

The Higher Technological Institute (HTI)	
Department: Department of Architecture Engineering	

Course Specification

ARE 224: Town planning (A)

Program(s) on which this course is given	Architecture Engineering
Department offering the program:	Architecture Engineering
Department offering the course:	Architecture Engineering

A– Basic information

Course Title:	Town planning (A)			**Course Code:**	**:**ARE 224		
Program / level	Architecture Engineering			Senior(1)			
Term/ Academic year:	Oct.-Jan. 2023 - 2024			**Credit Hours:**	2		
Contact Hours:	4	**Lecture:**	1	**Tutorial:**	-	**Practical:**	3
Pre-Requisite	ARE 214						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

Course Aims:

- Identify the general definition for physical planning at different levels, Comprehensive studies (goals, objectives, stages & tools).

- define the planning criteria, programming & stages of implementation, principles of land uses, neighborhood theory, slum clearance & replanting of slum area and Study of housing problems, housing prototypes & solutions.

- Apply the factors & planning methodology influencing housing areas. Combined project on housing & Through the study of an existing urban center and a newly developed urban center within the city) The first project aims to restore the function of the existing environment to what it was, with all aspects of this function in terms of social, economic, and environmental aspects, in addition to the physical aspect and field methods for

evaluating the existing urban environment and the problems of deterioration occurring in it and the direct and indirect causes of the emergence of these problems. The second project aims in the region The new urban setting aims to define the function of the future urban environment and devise ways to attract new users whose needs are commensurate with the capabilities and function of the center, all within a general vision based on the idea of sustainable urban planning.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Apply the mechanism of sustainable urban development (theoretically and practically) through urban planning projects in new and existing urban areas

CLO 2. Identify policies to deal with urban deteriorating areas

CLO 3. Develop appropriate programs for planning and urban renewal and development

CLO 4. prepare plans and appropriate solutions for existing and new urban areas.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	**COMPETENCIES of Architectural ENGINEERING**
Program Academic Standards that the course contributes in achieving	A3,A4,A6,A7	B1,B2,B4

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.3. 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 conceptualize and treat urban places as meaningful entities **LO2**. Explain the interaction and relationship between population groups, economic activities, and the natural and built environments from an interdisciplinary perspective. **LO3**. Analysis of quantitative and qualitative data appropriate to the study of urban areas **LO7** . identify problems and solve

		them, and uphold standards of planning ethics and professionalism
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO4**. Apply ethical standards for conducting research, for reporting findings. **LO5** . develop knowledge, analytical tools, critical thinking, and teamwork **LO6** . produce creative, innovative, sustainable planning that is accommodating public interest in which the resulting plans are reviewed on the rules and theories of planning
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO6** . produce creative, innovative, sustainable planning that is accommodating public interest in which the resulting plans are reviewed on the rules and theories of planning **LO7** . identify problems and solve them, and uphold standards of planning ethics and professionalism **LO8** . interpret cultural diversities, local wisdom, and values/norms in the urban planning process
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO4**. Apply ethical standards for conducting research, for reporting findings. **LO7** . identify problems and solve them, and uphold standards of planning ethics and professionalism **LO6** . produce creative, innovative, sustainable planning that is accommodating public interest in which the resulting plans are reviewed on the rules and theories of planning
COMPETENCIES of Architectural ENGINEERING	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**LO1**. Define conceptualize and treat urban places as meaningful entities **LO2**. Explain the interaction and relationship between population groups, economic activities, and the natural and built environments from an interdisciplinary perspective. **LO6** . produce creative, innovative, sustainable planning that is accommodating public interest in which the resulting plans are reviewed on the rules and theories of planning

	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO1**. Define conceptualize and treat urban places as meaningful entities **LO6** . produce creative, innovative, sustainable planning that is accommodating public interest in which the resulting plans are reviewed on the rules and theories of planning
	B.4Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	**LO2**. Explain the interaction and relationship between population groups, economic activities, and the natural and built environments from an interdisciplinary perspective **LO6** . produce creative, innovative, sustainable planning that is accommodating public interest in which the resulting plans are reviewed on the rules and theories of planning

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

General definition for physical planning at different levels. Comprehensive studies (goals, objectives, stages & tools). Studies cover planning criteria, programming & stages of implementation, principles of land uses, neighborhood theory, slum clearance & replanting of slum area. Study of housing problems, housing prototypes & solutions. Factors & planning methodology influencing housing areas. Combined project on housing & planning.

5.2.Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec	**Tut**	**Lab**	
Week -1	- General definition for physical planning at different levels, types. Objectives, - Tools and choosing groups.	4	1	0	3	**LO1.,LO2,LO6,LO8**
Week-2	- Planning. - The site, situation, Region and the main planning problems. And base maps + Course project.	4	1	0	3	**LO2,LO3, LO7 .**
Week-3	- Planning &Towns. - Cad base maps and region survey	4	1	0	3	**LO3. LO5, LO6,LO8**

Week-4	- Town Planning. - project follow up	4	1	0	3	**LO1,LO3, LO4.**
Week5	- Land uses ,buildings heights , roads , buildings structural materials ,building conditions maps - project follow up	4	1	0	3	**LO1,LO2,LO8**
Week-6	- Land Uses - slum clearance & replanting of slum area. - project follow up	4	1	0	3	**LO6 ,LO7 ,LO8.**
Week-7	- Planning Standards, Housing. - Neighborhood & Housing - (Housing Issues/ Definition/ - Housing SystemTypes/Housing - Prototypes /Housing problems - & solutions) - project follow up	4	1	0	3	**LO2,LO6 ,LO7 ,LO8.**
Week-8	**Midterm Exam.**					
Week-9	- Land Uses Planning Polices. - project follow up	4	1	0	3	**LO4, LO5 ,LO7 ,LO8.**
Week-10	- Land Uses Planning Polices. - Problems of planning - project follow up	4	1	0	3	**LO4, LO5,LO7 ,**
Week-11	- Project follow up (problems presentation)	4	1	0	3	**LO3,LO4,LO7 ,LO8**
Week-12	- Project follow up (solving planning problems)	4	1	0	3	**LO4, LO5 LO6, LO7**
Week-13	- Final project hand out	4	1	0	3	**LO1,LO2,LO4, LO5 , LO7 ,LO8.**
Week-14	Revision	4	1	0	3	**LO1,LO2, LO3,LO4, LO5 ,LO7 ,LO8.**
Week 15	**Final Exam.**					

6- Matrix of Course Objective and Los

Course Learning Objectives	**Learning Outcomes (LOs)**							
	LO 1	**LO 2**	**LO 3**	**LO 4**	**LO 5**	**LO 6**	**LO 7**	**LO 8**
CLO 1	√	√	√	√	√	√	√	√
CLO 2	√	-	√	-	√	-	√	√
CLO 3	√	√	-	-	√	√	√	√

CLO 4	√	√	-	√	√	√	-	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)							
	General - Architectural ENGINEERING							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√	√	√	√	-	√	√	√
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	√	-	√	-	-	√	-	√
Group Discussion	√	-	-	√	√	√	√	√
Laboratory	-	-	-	-	-	-	-	-
Site Visit	√	√	-	√	√	√	√	-
Presentation	√	-	√	√	√	√	√	√
Mini Project	√	√	√	√	√	√	√	√
Research and Reporting	√	√	√	√	√	√	√	√
Brain Storming	-	√	√	-	√	-	√	√
Self-Learning	-	-	-	-	-	-	-	-

8- Assessment

Assessment Method	Timing	Grade (Degrees)
Semester Work: seminars, quizzes assignments and project	Bi-Weekly	40
Mid-Term Exam	8-th Week	30
Written Exam	15-th Week	30
Total		100

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)							
	General ARCH							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√	-	-	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√	-	√	-	-	√	√	√
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	-	-	√	-	-	-	-	-
Research Assignment	√	√	-	√	√	-	√	√
Reporting Assignment	√	√	√	√	√	√	√	√
Project Assignment	√	√	√	√	√	√	√	√
In-Class Questions	√	√	-	√	√	-	-	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Appropriate teaching accommodation including teaching aids
B- computers
C- data show.

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- **CARMONA, Matthew. Public places urban spaces: The dimensions of urban design. Routledge, 2021.**
- **Planning Methodology and History by Wegener-2009**
- **WATES, Nick; THOMPSON, John. The Community Planning Event Manual: How to use collaborative planning and urban design events to improve your environment. Routledge, 2013**.
- **Red Sea Life Project, United State Agency for International Development , Chemonics International, Septemper 2007.**
- **Planning and Urban Design StandarA Planners Dictionary by Michael Davidsods by Emina Sendich (Editor); American Planning Association Staff -2006**
- **International Institute for Management Development", World Competitiveness, IMD, Yearbook, Lousanne, 2002.**
- **Moughtin ,Ciiff , Oc , Urban Design :Street and square , Oxford ,Architectural Press,3rd ,Ed , 2003**
- **Red Sea Life Project, United State Agency for International Development , Chemonics International, Septemper 2007.**
- **Planning Methodology and History by Wegener-2009**
- **London benevolent , The English edition of Die Geschichte der Stoldt : The History of the city , 1980.**
- **Moughtin ,Ciiff , Oc , Taner, Tiesdell , Steven , Urban Design : Ornament and Decoration, Oxford , Butterworth Architecture,1995.**
- **Batho. A," The Assessment: International Competitiveness " Oxford Review of Economic Policy,**

Vol.12, No. 3, 1996.
- World Economic Fourm, "The Global Competitiveness Report " W.E.F., Geneve, 1996/2020
- Planning and Urban Design StandarA Planners Dictionary by Michael Davidsods by Emina Sendich (Editor); American Planning Association Staff -2006
- Regional Planning by Plane-2007

- زايد عبد الله, محمود; محمود. أسس التخطيط المرن المستدام: رؤية مستقبلية لمفهوم المدينة البطيئة .آفاق عربية و إقليمية.221-206 :8.14 ,2023 ,
- محمد, داليا السيد; داليا السيد. مواصفات المدن الذكية وأثرها على تخطيط المدن فى المستقبلJournal of the . Egyptian Society of Engineers, 2020, 59.1: 52-44.
- عبد الفتاح, فاطمة جمال الدين; فاطمة جمال الدين. أسس ومعايير التخطيط البيئي للمجتمعات العمرانية المستدامة حالة النسق الصحراوي بالواحات المصرية ,Journal of the Egyptian Society of Engineers, 2019 . 58.3: 25-20.
- د/ أحمد خالد علام ـ قوانين التخطيط العمراني ـ مكتبة الأنجلو ـ 1995م .
- د/ أحمد خالد علام ، د/ عبد الغنى شعبان عبد العظيم ـ العمران والحكم المحلى في مصر ـ مكتبة الأنجلو المصرية ـ 2000م .
- د/ احمد خالد علام وآخرون – تخطيط المدن – مكتبة الأنجلو المصرية – القاهرة 1998–م.
- إبراهيم العيسوي ـ " التنمية في عالم متغير "ـ دار الشروق – القاهرة ـ مصر- 2003م.
- عثمان محمد غنيم ـ" التخطيط أسس ومبادئ" ـ دار حفاء للنشر والتوزيع ـ عمان ـ الطبعة الاولي 1999– م.
- الكتاب الاحصائي السنوي ـ أعداد متفرقة ـ مركزالتعبئة العامة و الاحصاء. 2000: 2021 .
- كتاب مصر في أرقام ـ أعداد متفرقة ـ مركزالتعبئة العامة و الاحصاء. 2000: 2021.
- محمد عبد الشفيع عيسي-" القدرة التنافسية من منظور التطور التكنولوجي ، مع تركيز خاص علي الاستراتيجية الصناعية"- مصر المعاصرة – العدد 460،459 – يوليو ، اكتوبر 2000–م.
- زين الدين عبد المقصود ـ "التخطيط البيئي" ـ مفاهيمه ومجالاته ـ قضايا البيئة ـ جمعية حماية البيئة الكويتية ـ الكويت- 1987 م.
- أحمد الجلاد ـ " التخطيط السياحي والبيئي بين النظرية والتطبيق"- عالم الكتب – الطبعة الأولي- القاهرة ـ مصر- 1988 م.
- تصميم وتخطيط المواقع السكنية: نسمات عبد القادر – سيد التونى- مكتبة العربى.

10.3. Recommended Books:

- تنمية التجمعات العمرانية الجديدة ـ مدخل تنموي لاستدامة الاسكان في العاصمة الادارية الجديدة لمصر: نسمة محمد عبد المقصود ـ رسالة دكتوراه- كلية الهندسة -جامعة الفيوم ـ 2019م
- مشكلة الإسكان في مصر : احمد خالد علام ـ وزارة الإسكان والمرافق العمرانية ، 2004 ، مبارك والعمران ، انجازات الحاضر لبناء المستقبل

10.4. Web Sites:

- http: //www.investment.gov.eg.
- http://www.evdata.worldbank.org
- http://www.worldbank.org
- http://www.world economic fourm.org\index

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Course Directors	Name	Signature
Teaching staff	Ass.Prof.Asmaa Mostafa Elshamy	
Course coordinator	Dr. maysa selim	
Program coordinator	Dr.Mohamed Nabil	
Head of the Department	Prof. Esam Khalifa	
Date of approval	Oct-Jan 2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 225 : Legislation and management of construction project

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	**Legislation and management of construction project**			**Course Code:**		ARE 225	
Program / level	Architectural Engineering			SENIOR (1)			
Term/ Academic year:	Oct -Jan 2023 - 2024			Credit Hours:		2	
Contact Hours:	3	Lecture:	1	Tutorial:	2	Laboratories:	-----
Pre-Requisite	ARE 142						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

To ensure that the graduates have an understanding of the architectural & urban legislations and ethical responsibility in the practice of architectural engineering through:.

1- Illustrate codes, legislations and building regulations.

2. Recognize and illustrate the professional practice codes and legislations in terms of rights, commitments, and ethics.

3. Introduces students to deal with basic case studies with reference to building codes and regulations.

4. Explain the roles of the architect, the contractor, and the owner during both the design and construction stage.

5. Understand the different types of contracts

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

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CLO 1. Recognize Theories and Legislations of building regulations

CLO 2. Recognize professional ethics and impacts of engineering solutions on society and environment

CLO 3. Identify in innovative way the problem solving of building regulations

CLO 4. Report engineering decisions considering balanced costs, benefits, safety, quality, and reliability.

CLO 5. Apply quality assurance procedures and follow codes of practice and standards.

CLO 6. Find information and engage in life-long self-learning discipline.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of Arc
Program Academic Standards that the course contributes in achieving	A1, A6, A9	B4,B5

4- Mapping Course Los to NARS

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	LO 1. Recognize Theories and Legislations of building regulations
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	LO 2. Ethics of practicing the profession (Architectural engineer LO 3. Code of Professional Practice - Principles for the Tradition of Architectural
	A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO4. understanding Types of contracts - Contracting methods in construction projects - Types of contractual agreements

COMPETENCIES of ARC	B.4Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	LO 5. Common terminology in Construction industry and building law. LO 6. Study of Laws and legislations of building regulations.
	B.5 Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	LO7. prepare Building permits (procedures, commitment, Follow-up, and punishments).

5- *Course Content:*

5.1. Course Description (As indicated in program Bylaw):

The course ensures that graduates have an awareness of architectural and urban regulations, as well as ethical responsibility in the field of architectural engineering. Show examples of codes, laws, and construction rules. Recognize and demonstrate professional practice rules and legislation in terms of rights, responsibilities, and ethics. Introduces pupils to fundamental case studies involving construction rules and regulations. Explain the architect's, contractor's, and owner's roles during the design and building stages. Recognize the many sorts of contracts

5.2. Course Topics/hours/Los Matrix

Week No.	***Topic***	***Total Hours***	***Contact hrs***			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	Definition of the subject - the role of the architect, owner and contractor during the building and construction process.	3	1	2	-	LO 1
Week-2	Ethics of practicing the profession (Architectural engineer responsibilities, relationship between the engineer and society	3	1	2	-	LO2

Week-3	Code of Professional Practice - Principles for the Tradition of Architectural	3	1	2	-	LO3
Week-4	Types of contracts - Contracting methods in construction projects - Types of contractual agreements Brief, introduction to illustrate codes, legislations and building regulation.	3	1	2	-	LO4
Week5	Quiz 1	3	1	2	-	
Week-6	Common terminology in Construction industry and building law.	3	1	2	-	LO6
Week-7	Laws and legislations of building regulations.	3	1	2	-	LO6 , LO7
Week-8	Midterm Exam.					
Week-9	Building permits (procedures, commitment, Follow-up, and punishments) Duties of the licensee and administrative Actors	3	1	2	-	LO7
Week-10	building codes, Limits of internal dimensions, areas and heights of building elements, Limits of courts area.- Case Study .	3	1	2	-	LO3, LO5
Week-11	Quiz 2	3	1	2	-	LO4,LO5
Week-12	Limits of staircase design, Limits of projection on streets and courts and insurance against Firefighting. Case	3	1	2	-	LO4,LO5
Week-13	Land division, Case Study.	3	1	2	-	LO1,LO3
Week-14	Revision	3	1	2	-	LO7
Week 15	Final Exam.					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	---	---
2nd	----	----

6- Matrix of Course Objective and Los

Course Learning Objectives	Learning Outcomes (LOs)						
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7
CLO 1	√	√	-	-	-	-	-
CLO 2	-	√	√	-	√	√	√
CLO 3	-	-	-	-	√	-	-
CLO 4	-	-	√	√	√	√	-
CLO 5	-	-	√	-	√	-	√
CLO 6	-	-	√	√	√	√	√

7- course Teaching and Learning Methods:

Teaching and Learning Methods	Learning Outcome(LOs)						
	Architectural Engineering						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Face-to-Face Lecture	√	√	√	-	√	√	√
Online Education	-	-	-	-	-	-	-
Tutorial/ Exercise	√	-	√	-	√	-	-
Group Discussion	-	√		√	-	√	√
Laboratory	-	-	-	-	-	-	-
Site Visit	-	-	-	-	-	-	-
Presentation	√	-	-	-	√	-	-
Mini Project	-	-	-	√		√	-
Research and Reporting	-	-	√	-	-	-	√
Brain Storming	√	-	-	-	-	-	-
Self-Learning	-	-	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	Architectural Engineering						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Written Exam	√	√	√	√	√	√	√
Online Exam	–	–	–	–	–	–	–
Oral Exam	–	–	–	–	–	–	–
Quiz	√	√	√	√	√	√	√
Lab Exam	–	–	–	–	–	–	–

Take-Home Exam	–	–	–	–	–	–	–
Research Assignment	√	–	–	–	√	√	√
Reporting Assignment	–	–	–	–	–	–	–
Project Assignment	–	–	–	–	√	√	√
In-Class Questions	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (written)	**40**	15th	90 min.
Midterm written Exam (Term Work)	**20**	8th	60 min.
End of term laboratory exam (Lab)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (Term Work)	**20**	weekly	---
Quizzes/reports/presentation (Term Work)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Projector.
B- Computer.
C- Printer
D- data show

10- *List of References:*

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- قانون البناء 119 - لسنة 2008 ولائحته التنفيذية المطابع الاميرية2016 م.
- عبد الفتاح السيد القصبي، حساب كميات الأعمال الإنشائية،دار الكتب العلمية ، 2015
- عبد الرشيد إبراهيم نصير، إدارة مشروعات التشييد، دار النشر للجامعات، 2010.

10.3. ecommended Books:

- الكود المصري لاخلاقيات وقواعد سلوكيات ممارسة مهنة الهندسة ولائحة الجزاءات وزارة الاسكان والمرافق والتنمية العمرانية 2013 – م.

- Web Sites:
- http://eea.org.eg/PageDetails.aspx?ID=305
- www.kbe.com

Course Directors	Name	Signature
Teaching staff	Dr. AHMED ELSHAHAT ELMENSHAWY	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct .- Jan 2023-2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 226: Technical Installation For Buildings (A)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Technical Installation For Buildings (A)			**Course Code:**		ARE 226	
Program / level	Architectural Engineering			**SENIOR (1)**			
Term/ Academic year:	Oct -Jan 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	2	**Lecture:**	2	**Tutorial:**	0	**Laboratories:**	0
Pre-Requisite	------						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Understanding the different types of faculties and recognize the advantage and disadvantage of each type .
- Ensure that the graduates are well trained in several areas of building services in specific sanitary installations in building
- To ensure the ability of students in defining, analyzing and solving a wide range of Sanitary Installation in Building problems using modern tools and techniques

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Identify the characteristics of engineering materials related to sanitary system

CLO 2. Describe quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues

CLO 3. Define current engineering technologies as related to Sanitary Installations, Architecture

CLO 4. Select appropriate solutions for sanitary engineering problems based on analytical thinking

CLO 5. Apply quality assurance procedures and follow codes and standards in sanitary installations and sanitary engineering

CLO 6. Produce professional workshop and technical drawings of sanitary and plumbing using traditional drawing and computer-aided drawings' techniques

.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARC
Program Academic Standards that the course contributes in achieving	A3, A4	B2

3- ***Mapping Course Los to NARS***

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 1** Identify the characteristics of engineering materials related to sanitary system . **LO 2.** Describe quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues

		LO 3. Define different types of technologies as related to Sanitary Installations, Architecture
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 4.** Analysis the different types of sanitary and different methods of f sanitary and plumbing
COMPETENCIES of ARC	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO5.** Determine tasks according to the different competencies of members of the same team **LO 6.** Select the appropriate system and material for different civil and architectural work.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Sanitary engineering; P1umbing and building equipment sanitation, public heath education, and sewage disposal system. Water supply; public intakes, sedimentation and clarifies, filtration, chlorinating, disinfecting, storing and distribution. Plumbing system, plumbing fixtures, and distribution system. The main and branches, connections, and piping materials. Building mechanical equipments : lifts, escalators, kitchens and laundries.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction& Abbreviations, Symbols& Legend.	2	2	0	0	**LO 1.**
Week-2	Sanitary Fixtures For Buildings	2	2	0	0	**LO 2.** **LO 4.**
Week-3	Insulation Works. The Pipe Works. Potable Water Sources.	2	2	0	0	**LO3.** **LO 5.**
Week-4	Quiz 1	2	2	0	0	**LO**
Week5	Potable Water Sources. Potable Water Treatment Work.	2	2	0	0	**LO 2.** **LO 3.**
Week-6	Potable Water Supply For Buildings.	2	2	0	0	**LO 3.** **LO 4.**

	The Hot Water Works.					
Week-7	Potable Water Supply For Buildings. The Hot Water Works.	2	2	0	0	**LO 5.**
Week-8	**Midterm Exam.**					
Week-9	Sanitary Drainage And Ventilation Works	2	2	0	0	**LO 4.** **LO 5.**
Week-10	Quiz 2	2	2	0	0	**LO**
Week-11	Storm Water Drainage Works.	2	2	0	0	**LO 4. LO 6.**
Week-12	Sewage Treatment Works	2	2	0	0	**LO 4.** **LO 6.**
Week-13	Fire Fighting Works.	2	2	0	0	**LO 5.** **LO 6.**
Week-14	Revision.	2	2	0	0	**LO 6**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	---------	----
2nd	---------	----

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)					
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6
CLO 1	√	√	-	-	-	√
CLO 2	-	√	√	-	√	-
CLO 3	-	-	-	-	√	√
CLO 4	-	-	√	√	√	-
CLO 5	-	-	√	-	√	√
CLO 6	-	-	√	√	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)					
	Architectural Engineering					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Face-to-Face Lecture	√	√	√	√	√	√
Online Education	--	--	--	--	--	--
Tutorial/ Exercise	√	√	√	√	√	√
Group Discussion	--	√	--	--	--	√
Laboratory	--	--	--	--	--	--
Site Visit	--	--	--	--	--	--
Presentation	--	--	√	√	√	--
Mini Project	--	--	--	--	--	√
Research and Reporting	√	√	--	--	--	--
Brain Storming	√	√	--	--	--	√
Self-Learning	--	--	--	--	--	--

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Written Exam	√	√	√	√	√	√
Online Exam	--	--	--	--	--	--
Oral Exam	--	--	--	--	--	--
Quiz	--	√	√	√	√	--
Lab Exam	--	--	--	--	--	--
Take-Home Exam	--	--	--	--	--	--
Research Assignment	--	√	√	√	√	--
Reporting Assignment	√	√	√	--	--	√
Project Assignment	--	--	√	√	√	--
In-Class Questions	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Projector.
B- Computer.
C- Printer.

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Egyptian Code , Plumbing system for buildings.
- Uniform Plumbing Code, National Plumbing Code.

10.3. Recommended Books:

No.	Reference List
1	A.C. Panchdhari, Water Supply and Sanitary Installations, New Age International, 2005.
2	Roy Chudley and Roger Greeno, Building Construction Handbook, 10th Edition, Routledge, Taylor & Francis Group, 2016
3	R. Barry, The Construction of Building Volume 5, Blackwell Science Ltd, 1998
4	Related References acquired from “The Egyptian Knowledge Bank” at: http://www.ekb.eg/

10.4. Web Sites:

Course Directors	Name	Signature
Teaching staff	Dr. AHMED ELSHAHAT ELMENSHAWY	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct .- Jan 2023-2024	

The Higher Technological Institute (HTI)	
Department: Department of Architecture Engineering	

Course Specification

ARE 237: Comp .App.In Arch (3).

Program(s) on which this course is given	Architecture Engineering
Department offering the program:	Architecture Engineering
Department offering the course:	Architecture Engineering

A– Basic information

Course Title:	Comp .App.In Arch (3).			**Course Code:**		ARE 243	
Program / level	Architecture Engineering			**SENIOR (2)**			
Term/ Academic year:	Oct–Jan 2023–2024			**Credit Hours:**		2	
Contact Hours:	6	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	6
Pre-Requisite	ARE 213						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Enhance communication between Individuals and machine in 3D programs.
- Use computational facilities, techniques and laboratory in 3d drawings
- Merge knowledge of 3d commands and understanding of Architecture drawings
- Use a wide range of analytical tools and software of 3d during specialized procedures
- Innovative suitable solutions of architecture drawing problems.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Aware professional of 3d Max programme.

CLO 2. Achieve the interpret result in Architectural drawings using specified commands.

CLO 3. Produce drawings in 3d program according to good understanding of 3d software packages of architecture program.

CLO 4. Create 3d modelling of contemporary architectural projects according to professional application of 3d program.

CLO 5. Apply numerical modelling solutions of architecture problems

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A8,A9	B2, B3, B4

4- *Mapping Course Los to NARS*

3- *Mapping Course Los to NARS*

Field	ogram that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO1. Communicate to contemporary form by applying 3D Max program . LO2. Use contemporary tools in different 3D Max drawings of architectural projects.

	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3. use creative and flexible thinking in produce 3d Modeling drawings
COMPETENCIES of ARCHITECTURAL ENGINEERING	B2. Produce designs that meet building user's requirements through understanding the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces and needs and between them to human scale.	LO4. Produce designs that meet building user's requirements in spaces and human scales through 3d Modeling drawings
	B3. Generate ecologically responsible , environmental conversation and rehabilitation designs,through understanding of :structural design , construction ,technology ,and engineering problems associated with building designs .	LO5. Generate 3d Modeling drawings consider Structural design ,construction ,technology through

	B4. Transform design concepts into buildings and integrate plans into overall planning within the constraints of project financing ,project management ,cost control and methods of project delivery ,while having adequate knowledge of industries ,organizations ,regulations , and procedures involved .	LO6. Generate 3d Modeling drawings consider project finacing ,cost control . LO7. Produce 3d Modeling drawings consider knowledge of industries ,organizations ,regulations , and procedures involved .

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The use of software in the development of architectural designs, formation, architectural presentation and three- dimensional models.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	General introduction of the 3ds Max program, and the components of the computer that correspond to the capabilities of the Max program to work better + definition of the program's interface and main menus.	6	0	0	6	**LO 1**
Week-2	Introducing the program's main tools for moving, rotation and zooming, and how navigation works within projects, whether internal or external + introducing some importantshortcuts.	6	0	0	6	**LO 1,LO2**.

Week-3	How to insert photos into 3ds max andsee them, Using the tools for drawingthe line and two-dimensional shapes (SP Line Tools) + How to correctly insert a plan from the AutoCAD program into the Max program and see its lines.	6	0	0	6	**LO1,LO2,LO3**
Week-4	How to apply commands to 2D shapesto turn them into 3D shapes, such as: Loft-Lath-Sweep-Bevel Profile-Extrude	6	0	0	6	**LO1,LO2,LO3**
Week5	Explanation of some commands that are applied to 3D models such as: Bend-Taper- Slice-Cap holes- Symmetry-Turbo Smooth	**6**	**0**	**0**	**6**	**LO1,LO2,LO3 ,LO4,LO5**
Week-6	Quiz					
Week-7	Explanation of commands that require a large number of Segments, such as Displace-Cloth-Wave-Ripple -Noise	**6**	**0**	**0**	**6**	**LO1,LO2 ,LO4,LO5**
Week-8	**Midterm Exam.**					

Week-9	Explanation of how to convert 3Dmodels to Editable Poly, through a practical workshop	6	0	0	6	**LO1,LO2,LO3 ,LO4,LO5**
Week-10	Explain the rest of the Editable Poly commands, through a practical workshop.	6	0	0	6	**LO3,LO5**
Week-11	Explanation of Compound Objects.	6	0	0	6	**LO3,Lo4 ,LO5**
Week-12	Explanation of some plugins, and howto install them on the Max program and work with them.	6	0	0	6	**LO3,LO5,LO7**
Week-13	Quiz					

Week-14	Explain how V-Ray Lighting is placed in indoor and outdoor scenes. Explanation of how to put cameras inside the project, and Render settings.	6	0	0	6	**LO1,LO2,LO3 ,LO4,LO5,LO6 ,LO7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	6
2nd	----------	

6- Matrix of Course Objective and LOs

ourse Learning Objectives	Learning Outcomes (LOs)						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
CLO 1	√		√			√	√
CLO 2	√						
CLO 3	√	√					
CLO 4	√		√	√			
CLO 5				√	√	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	ARCHITECURAL ENGINEERING						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Face-to-Face Lecture	√	√	√	√	√	√	√ √
Online Education	--	--	--	--	--	--	-- --
Tutorial/ Exercise	√	√	√	√	√	√	√ √
Group Discussion					√	√	
Laboratory	√	√	√	√	√	√	√
Site Visit	--	--	--	--	--	--	--
Presentation	√			√		√	√
Mini Project	--	--	--	--	--	--	--
Research and Reporting	--	--	--	--	--	--	--
Brain Storming		√	√	√		√	√
Self-Learning	--	--	--	--	√	√	--

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	ARCHITECURAL ENGINEERING						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Written Exam	√	√	√	√	√	√	√
Online Exam	--	--	--	--	--	--	--
Oral Exam	--	--	--	--	--	--	--
Quiz	√	√		√	√	√	
Lab Exam	√	√	√	√	√	√	√ √
Take-Home Exam	--	--	--	--	--	--	--
Research Assignment	--	--	--	--	--	--	--
Reporting Assignment	--	--	--	--	--	--	--
Project Assignment	√	√	√	√	√	√	√
In-Class Questions		√	√	√			

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	**15th**	210 min
Midterm written Exam (*Term Work*)	**30**	**8th**	150 min
End of term laboratory exam (*Lab*)	**-**	**-**	**-**
End of term Oral exam	**-**	**-**	**-**
Tutorial and report assessment(*Term Work*)	**20**	**weekly**	**---**
Quizzes/reports/presentation(*Term Work*)	**20**	**According to the schedule**	**---**
Total Mark	**100**		

9- Facilities Required:

A- Projector.
B- Computer.
C- Printer.

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Any book in 3D Max in the libarary in the Institute.

10.3. Recommended Books:

- Auto desk 3ds Max 2021 Complete Reference Guide, Kelly L. Murdock's
- Autodesk 3ds Max 2021 Fundamentals
- Autodesk 3ds Max 2020: A Detailed Guide to Modeling, Texturing, Lighting, and Rendering, 2nd Edition, by Pradeep Mamgain
- Autodesk 3ds Max 2021: A Detailed Guide to Modeling, Texturing, Lighting, and Rendering, 3rd Edition, by Pradeep Mamgain
- 3ds Max Speed Modeling for 3D Artists, by Thomas Mooney
- Kelly L. Murdock's Autodesk 3ds Max 2021 - Paperback, by Murdock Kelly L. – Good
- Kelly L. Murdock's Autodesk 3ds Max 20... by Murdoch, Kelly Paperback / softback

Book Links :

- https://www.ebay.com/itm/364494940071?_trkparms=amclksrc%3DITM%26aid%3D1110018%26algo%3DHOMESPLICE.COMPLISTINGS%26ao%3D2%26asc%3D20230821142934%26meid%3D5fb8c06c5ab646508b26b706e5893310%26pid%3D101196%26rk%3D2%26rkt%3D12%26sd%3D145280989011%26itm%3D364494940071%26pmt%3D1%26noa%3D0%26pg%3D4429486%26algv%3DCompVIDesktopATF2V3WithQueryItemRecallV3&_trksid=p4429486.c101196.m2219&amdata=cksum%3A3644949400715fb8c06c5ab646508b26b706e5893310%7Cenc%3AAAQAIAAABALHyIAEaemKG0mx4REjf%252BHxECBsXtSkNHsCLmXz%252FJyCDeX%252FaDb78456J9CQJiWkf1tgTfr%252FPFYC1gWKGoVwZogxmNc4B8XDh%252FSDBqPXDVN%252FzJBpcHN%252BEkpF3NJHvvVj%252FEjnrD8Gz3Agu32V4PLRSvmlL1I5zkBPWXCHFt9AtVAunsq4%252FwHze0s7vu9ALeAQJhIfEqHa%252F%252FsTCNvnIHaG0%252BK5mQHPlvRXyCQ2VsIK%252FIgQnfuiVhqIfI%252F7OfjTcTQH3%252BlC5GanjBaUHLFkWexSf9mSdQrZaBKj7VWfu3XKN1Y%252FTYtr1ejlzZ8fdNO%252BjK2uC3TJvw4dKl%252FyIBNyMVzLB7ls%253D%7Campid%3APL_CLK%7Cclp%3A4429486&epid=28038638906
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- https://www.ebay.com/itm/125822483095?_trkparms=amclksrc%3DITM%26aid%3D1110018%26algo%3DHOMESPLICE.COMPLISTINGS%26ao%3D2%26asc%3D20230821142934%26meid%3D5fb8c06c5ab646508b26b706e5893310%26pid%3D101196%26rk%3D1%26rkt%3D12%26sd%3D145280989011%26itm%3D125822483095%26pmt%3D1%26noa%3D0%26pg%3D4429486%26algv%3DCompVIDesktopATF2V3WithQueryItemRecallV3&_trksid=p4429486.c101196.m2219&amdata=cksum%3A1258224830955fb8c06c5ab646508b26b706e5893310%7Cenc%3AAQAIAAABALHyIAEaemKG0mx4REjf%252BHxECBsXtSkNHsCLmXz%252FJyCDeX%252FaDb78456J9CQJiWkf1lJOimAE8T%252BV1nqWyxdlLe9Lo4ca57r1Ag1bGUHIhaNUfefJeQGB8WGveQJLTn2%252FrafUEWuABzVJqSLY%252BbZDYIZ6N8UllrdcOhsArIBVttUtfM%252BkdOtRk9iy9eXsyKYhq2NIZ0WobrhYOGgSzqM4LZZGMMUMZyS38dv8RlEmNhlwUXS%252B%252Fjvc%252BDZsixuzYnHFbXfSSrr6TlvoiZ6PvchxzNhBHeViGX0DWpTYmV6WLQqZJZIA8vsj1Q%252BbhzAaR5cAQouEooXLOoycOLm11A1ReaQ%253D%7Campid%3APL_CLK%7Cclp%3A4429486&epid=236786149

- https://www.ebay.com/itm/364542663327?_trkparms=amclksrc%3DITM%26aid%3D1110018%26algo%3DHOMESPLICE.COMPLISTINGS%26ao%3D2%26asc%3D20220808120039%26meid%3Daf6e113fbe5240d19f6bd8d49607893b%26pid%3D101544%26rk%3D10%26rkt%3D25%26sd%3D145280989011%26itm%3D364542663327%26pmt%3D1%26noa%3D0%26pg%3D4406038%26algv%3DCompVIDesktopATF2V3WithQueryItemRecallV3%26fpg%3D0&_trksid=p4406038.c101544.m1851&amdata=cksum%3A364542663327af6e113fbe5240d19f6bd8d49607893b%7Cenc%3AAQAIAAABALHyIAEaemKG0mx4REjf%252BHxECBsXtSkNHsCLmXz%252FJyCDV9Ot3JsbflDBQK2JRgzJiaHyU5uMebNkcr%252B28Cmpw7dh2nHa5r9EdoqA0Ce5onYAohWM49rmzys769I3uDFxI9FqTOkSkOiR3aXgKAsQl21pgB20ho%252BLytfqkA22Ks2w1u2xFATUVHKbGnDjvtEcvdUOeVCdJwLBjNyaVC29KvSYT%252F7tULk0wGvADFs58QJYGojDmpvrnWTpvTD%252F37bDfY0aNCA78rjPr%252Bv5UOzYQE%252FFvfsBWQgW931bBAfLHbJ1q9i9xctBg4qM3lxLg%252FJDEBXYSYPch5ts64YKpzGWjT8%253D%7Campid%3APL_CLK%7Cclp%3A4406038&epid=28050397648

10.4. Web Sites:

- www.autodisk.com

Course Directors	Name	Signature
Teaching staff	**Dr. Assistant Professor / Ashraf Moustafa Labib**	
Course coordinator	**Assoc. Prof. Sahar Ezz El Arab Ramadan**	
Program coordinator	**Dr. Mohamed Nabil El Sbaie**	
Head of the Department	**Dr .Prof. Essam Kalifa**	
Date of approval	**Oct -Jan 2023 – 2024**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 238: Green Architecture

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Green Architecture			**Course Code:**		ARE 238	
Program /Level	Architectural Engineering			**JUNIOR**			
Term/ Academic year:	Oct.-Jan.2023 - 2024			**Credit Hours:**		3	
Contact Hours:	3	**Lecture:**	2	**Tutorial:**	2	**Laboratories:**	-----
Pre-Requisite	-----						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Identify green architecture and the importance of ecological resources.
- Enhance architectural design with environmental methods and technology.
- Focus on reuse, reduction, and recycling of resources.
- Investigate the complexities of ecosystems within the context of architectural design.
- Analyze and comprehend the foundational principles underlying the concept of green architecture.
- Evaluate and assess various theories pertinent to the field of green architecture.
- Explore the intricate relationship between green architectural practices and their impact on climate dynamics.
- Engage in a comprehensive design project centered around the principles and applications of green architecture.

2- Course Learning Objectives (CLO):

At the end of this course, students should be able to :

CLO 1. Acquiring expertise in designing green architecture.

CLO 2. Enhancing and identifying the principles of green architecture.

CLO 3. Enhance the reduction of the consumption of nonrenewable energy and replace it.

CLO 4. Enhance recycling of materials.

CLO 5. Analyze modern methods and technology to reduce energy consumption.

CLO 6. Identify architectural material that is friendly to the environment and can be used again.

CLO 7. Identify the global system that organizes the principles of green architecture.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARC
Program Academic Standards that the course contributes in achieving	A3,A5,A6	B2,B3

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**A3.** Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO1:** Identify the basics and principles of sustainability and green building. **LO2:** Deduct nonrenewable energy consumption and emphasize the use of renewable sources.
	A5. Practice research techniques and methods of investigation as an inherent part of learning	**LO4.** Practice research techniques emphasizing resource reuse, energy reduction, and recycling.
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO3**. Utilize contemporary technologies to protect the environment and minimize energy consumption.

	B2. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO5.** Recognize the relationship between buildings and the environment by selecting appropriate architectural materials.
	B3. Generate ecologically responsible , environmental conservation and rehabilitation designs through understanding of : structural design , construction , technology and engineering problems associated with building designs .	**LO6.** Recognize global organizations accountable for environmental stewardship, like LEED, and comprehend their guiding principles. **LO7.** Discover methods for water treatment and formulate tactics to diminish resource consumption in this domain.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The course aims to learn about: Ecosystems - The concept of green architecture - Theories of green architecture - Green architecture and climate - Design project for green architecture.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	Introduction to Green Architecture	4	2	2	0	**LO1**.
Week-2	Definition of green architecture	4	2	2	0	**LO1**.
Week-3	The principals of green architecture.	4	2	2	0	**LO1**. , **LO2**. , **LO3**.
Week-4	The elements of Environmental Control and climate	4	2	2	0	**LO7**.
Week-5	Treatments of green architecture.	4	2	2	0	**LO7**.
Week-6	Environmentally compatible technology for green building management and operation	4	2	2	0	**LO3**., **LO 5**.
Week-7	**Midterm Exam.**					

Week-8	Environmentally compatible technology for green building management and operation	4	2	2	0	**LO3., LO 5.**
Week-10	The new technology for growing plants for building.	4	2	2	0	**LO4. , LO7..**
Week-11	Analyzing and studies of the most important examples of green architecture.	4	2	2	0	**LO 6.**
Week-12	Analyzing and studies of the most important examples of green architecture.	4	2	2	0	**LO 6.**
Week-13	Final researches &Analyzing	4	2	2	0	**LO 6.**
Week-14	General review	4	2	2	0	**LO 6.**
Week 15	**Final Exam.**					

5.3. Experiment Topics: (not applicated)

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	*Learning Outcome*(LOs)						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
CLO 1	✓	--	--	✓	--	--	--
CLO 2	✓	✓	✓	✓	✓	--	✓
CLO 3	--	✓	✓	✓	--	--	✓
CLO 4	--	--	--	✓	✓	--	--
CLO 5	--	✓	✓	✓	✓	--	✓
CLO 6	✓	--	--	✓	✓	--	--
CLO 7	--	--	--	--	--	✓	--

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	General	ARC					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Face-to-Face Lecture	✓	✓	✓	--	✓	✓	✓
Online Education	--	--	--	--	--	--	--
Tutorial/ Exercise	--	--	✓	✓	--	--	--
Group Discussion	✓	✓	--	✓	✓	✓	✓
Laboratory	--	--	--	--	--	--	--
Site Visit	--	--	--	--	--	--	--
Presentation	--	✓	✓	✓	✓	✓	--
Mini Project	--	--	--	--	--	✓	--
Research and Reporting	--	--	✓	--	✓	✓	--
Brain Storming	--	--	--	✓	--	✓	--
Self-Learning	--	--	✓	✓	--	--	--

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Written Exam	✓	✓	✓	✓	--	✓	--
Online Exam	--	--	--	--	--	--	--
Oral Exam	✓	✓	✓	--	✓	✓	--
Quiz	✓	--	--	✓	--	✓	--
Lab Exam	--	--	--	--	--	--	--
Take-Home Exam	--	--	--	--	--	--	--
Research Assignment	✓	✓	✓	✓	✓	✓	✓
Reporting Assignment	✓	✓	--	✓	--	--	--
Project Assignment	--	--	--	--	--	--	--
In-Class Questions	✓	✓	--	--	✓	✓	--

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	90 min.
Midterm written Exam (*Term Work*)	**30**	7th	60 min.
End of term laboratory exam (*Lab*)	**-**	**-**	**-**
End of term Oral exam	**-**	**-**	**-**
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- COMPUTER
B- PRINTER

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Ten Shades of Green: Architecture and the Natural World Paperback – January 17, 2006

10.3. Recommended Books:

- Toward a Living Architecture?: Complexism and Biology in Generative Design Hardcover – January 1, 2019
- Building Reuse: Sustainability, Preservation, and the Value of Design (Sustainable Design Solutions from the Pacific Northwest) Paperback – August 1, 2020

10.4. Web Sites:

https://www.amazon.com/dp/0295748079?tag=uuid10-20

https://www.amazon.com/dp/1517905370?tag=uuid10-20

Course Directors	Name	Signature
Teaching staff	**DR/ Alaa Eldeen Abdelrahman**	
Course coordinator	**Dr. Ghada Assal**	
Program coordinator	**Dr. Mohamed M. Elsebaay**	
Head of the Department	**Prof. Essam Khalifa**	
Date of approval	Oct.-Jan.2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	
Course Specification	
ARE 239: Renewal and modernization of urban areas	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Renewal and modernization of urban areas			**Course Code:**		ARE 216	
Program / level	Architectural Engineering			**SENIOR** (1),(2)			
Term/ Academic year:	Oct.-Jan 2023 -2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	0	**Tutorial:**	4	**Laboratories:**	0
Pre-Requisite							
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- ✓ Identify an Introduction to urban areas, their components, and the concept of upgrading, renewal, and rehabilitation
- ✓ renewal as a method of dealing with heritage buildings and district .
- ✓ Analyze important factors and causes of deterioration
- ✓ Explain important axes when raising the efficiency of heritage district and its buildings

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

.

CLO 1. Define the concept of renewal and upgrading efficiency

CLO 2. Explain The role of technology when dealing with heritage buildings and areas

CLO 3. Analyze various factors of deterioration, and their causes and identify policies to upgrade efficiency

CLO 4. Make comparative analysis based on local and international examples.

CLO 5. Develop a plan to raise the efficiency of heritage districts, invest them, and the effective impact on the economy

*3- **Relationship between the course and the Competencies :***

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A3,A4,A5,A7,A9	B1,B2,B3

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING GRADUATE	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 1.** Define the concept of upgrading, renewal, and rehabilitation and urban areas **LO 2.** analyze various factors of deterioration,
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 3**. Explain The role of technology when dealing with heritage buildings and areas **LO 4**. Evaluating the condition of heritage buildings and determining the most important policies to deal with them

	A.5. Practice research techniques and methods of investigation as an inherent part of learning.	**LO 5**. Measure the ability to activate self-learning strategies through group research,(research paper or electronic- PowerPoint presentations).
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 5**. Measure the ability to activate self-learning strategies through group research,(research paper or **LO 6**. apply the important axes when raising the efficiency of heritage district and its buildings
	A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO 7**. Develop a plan to raise the efficiency of heritage districts, invest them, and the effective impact on the economy
COMPETENCIES of ARCHITECCTURAL ENGINEERING	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**LO 3**. Explain The role of technology when dealing with heritage buildings and areas **LO 7**. Develop a plan to raise the efficiency of heritage districts, invest them, and the effective impact on the economy
	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 2.** analyze various factors of deterioration, **LO 6**. apply the important axes when raising the efficiency of heritage district and its buildings deterioration
	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 3**. Explain The role of technology when dealing with heritage buildings and areas **LO 7**. Develop a plan to raise the efficiency of heritage districts, invest them, and the effective impact on the economy

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

It introduces types of urban upgrading, renewal, and rehabilitation. Development policies of urban upgrading are reviewed through comparative analysis based on local and international examples. Also the concept of heritage in general and the architectural heritage in international conventions. The importance of preserving the architectural heritage and what are the various forms of preserving it, the causes of the deterioration of buildings and heritage areas and the most important negative factors affecting them. In addition, the concept of rehabilitating the heritage or historical building and the different patterns of rehabilitation, the methods used in the architectural restoration work.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	A general introduction types of urban upgrading, renewal, and rehabilitation	2	1	2	0	**LO 1, LO 2, LO3, LO4, LO 5**
Week-2	Development policies of urban upgrading are reviewed through comparative analysis based on local and international examples					**LO 1, LO 2, LO3, LO4, LO 5**
Week3	The importance of preserving heritage district - Policies dealing with it	2	1	2	0	**LO1, LO 2, LO3,LO4, LO 5**
Week4	analyze various factors of deterioration,	2	1	2	0	**LO1, LO 2, LO3, LO4, LO 5 , LO6**
Week5	Explain important axes when raising the efficiency of heritage district and its buildings	2	1	2	0	**LO1, LO 2, LO3, LO 5**,
Week6	General Review+ Quiz	2	1	2	0	**LO1, LO3, LO4, LO6**
Week7	**`Midterm Exam**					
Week8	Explain important axes when raising the efficiency of heritage district and its buildings	2	1	2	0	**LO3, LO4, LO 5**, **LO7**
Week 9	The role of technology when dealing with heritage buildings and areas					**LO3, LO4 LO 5 , LO6,LO8, LO9**
Week 10	invest heritage districts and the effective impact on the economy					**LO1, LO3, LO4, LO7, LO8,, LO9,**
Week-11	Quiz	2	1	2	0	**LO1 LO3,, LO5, LO4, LO7, LO8,, LO9**

Week-12	comparative analysis based on local and international examples					**LO1, LO5, LO4, LO3, LO7, LO8,, LO9**
Week-13	comparative analysis based on local and international examples	2	1	2	0	**LO1 LO3, LO4, LO7, LO8,**
Week-14	General Review					**LO1, LO 2, LO3, LO4, LO7, LO8, LO9**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	---------
2nd	----------	---------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
LO 1							
CLO 2							
CLO 3							
CLO 4							
CLO 5							

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	General						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Online Education							
Tutorial/ Exercise							
Group Discussion							
Laboratory							
Site Visit							
Presentation							
Mini Project							
Brain Storming							
Self-Learning							

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Written Exam							
Online Exam							
Oral Exam							
Quiz							
Lab Exam							
Take-Home Exam							
Research Assignment							
Reporting Assignment							
Project Assignment							
In-Class Questions							

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	8th	90 min.

Midterm written Exam (*Term Work*)	**20**	5th	60 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard

B- Projector

C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Recommended Books:

- Shipley, R., & Snyder, M. (2013). The role of heritage conservation districts in achieving community economic development goals. *International Journal of Heritage Studies*, *19*(3), 304-321. https://doi.org/10.1080/13527258.2012.660886.
- Willson, G. B., & McIntosh, A. J. (2007). Heritage buildings and tourism: An experiential view. *Journal of heritage tourism*, *2*(2), 75-93. https://doi.org/10.2167/jht024.0
- Akram, O. K., Franco, D. J., & Ismail, S. (2016). Development phases from heritage buildings to \smart buildings. *International Journal* of *Engineering Technology, Management and Applied Sciences*, *4*(4), 6-13.
- *UNESCO. Cultural Heritage Protection Act (CHPA). Retrieved 16 April 2020*

10.3. Web Sites:

- https://en.wikipedia.org/wiki/List_of_most_visited_museums
- https://en.unesco.org/sites/default/files/slov_cultural_heritage_protectio n_act_engtof.pdf

Course Directors	Name	Signature
Teaching staff	----------	
Course coordinator	Dr. maysa selim	
Program coordinator	Dr.mohamed nabil	

Head of the Department	Prof. Esam Khalifa	
Date of approval	Oct.-Jan 2023 -2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 241 : Architectural Design of Complex Buildings

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	: Architectural Design of Complex Buildings			**Course Code:**		ARE 241	
Program / level	Architectural Engineering			**Senior (2)**			
Term/ Academic year:	oct -Jan 2023 – 2024			**Credit Hours:**		3	
Contact Hours:	6	**Lecture:**	0	**Tutorial:**	6	**Laboratories:**	0
Pre-Requisite	ARE 221						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Identify the space expertise in architectural design and interior design.
- Enhance the formation and function of design.
- Focus on local environmental conditions.
- Study the site's content and analyze site planning elements.
- Study of structural coordination and construction technology.
- Study the relationship between internal and external spaces.
- A study of pedestrian and vehicle traffic paths.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Acquire the expertise in more complex projects.

CLO 2. Develop expertise in more complex different levels of movement.

CLO 3. Design and handle large-scale building and its structure system.

CLO 4. Establish knowledge of planning standards.

CLO 5. Analyze the relationship between internal and external spaces

.CLO 6. Enhance the local community and its culture.

CLO 7. Develop the design aspects of buildings through analysis of scientific information.

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3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARC
Program Academic Standards that the course contributes in achieving	A2,A6,A7A8	B1,B2,B3

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING GRADUATE	**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 basics and spaces organization and handle large-scale building. And solve its structure system.

		LO 2. evDelop the formation and function of design. And analyze the general requirements and architectural theories for the projects.
	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO 3**. Create designs considering the local materials, culture of the building location and the human scale. Taking into account cost and efficient design.
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 4**. Utilize local elements and make a Focus on local environmental conditions. And building material. Apply standards for extinguishing and building safety.
	A.8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**LO5**. Develop skills to solve the design problems of lesscommon complex projects by using modern methods and contemporary technology to make the building more efficient and sustainable and to match the global methods used .
COMPETENCIES of ARC	**B1**. Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies and human sciences	**LO 6**. Design of the building of the Engineers Syndicate. It works to use architectural design theories, solve the functional relationships of the building, link it to the local context. **LO 7.** Utilize the human and aesthetic standards of the building spaces to achieve the beauty and shaping of the building with the function

	B2. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 8**. Make the project internal and external integrated, use the appropriate scale for each space, link it to the number of users and maximize its benefits.
	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**Los 9** Link the main building to the surrounding environment, and make the general location a prelude to entry into the building through the on-site landscape elements. The shape of the building indicates its internal function.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Data gathering & analysis of different programs for buildings of complex nature or groups of buildings. Development of the architectural design of these buildings taking into consideration spacing and visual aspects. This course is carried out with special emphasis on modeling. Provide sufficient knowledge on dealing with different programs for buildings of complex nature or group of buildings. Comprehensive design projects addressing all design issues and higher levels of detail. Consideration will be given to the knowledge pertaining to other designdisciplines such as: urban design, landscape design, and construction detailing. The course will enhance skills on critical and analytical thinking as well as creative problem solving. A list of many advanced projects will be shown to select the term project from: Cultural centers, airports, olympic village, sport stadiums, residential complex, hospitals and health compounds, university campus, and cyber center or intelligent village.

5.2.Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered byCourse**
			Lec.	**Tut.**	**Lab.**	
Week -1	1st Design Program (Students Room) Brainstorming Research and project point with open discussion	3	0	6	0	**LO1.**
Week-2	Stud Studio Work – workshop group work Site selection and environmental analysis	3	0	6	0	**LO 2.**
Week-3	Feedback and Submission of 1st design sketches then dissemination of the updated program	3	0	6	0	**LO 6.**
Week-4	Research work and group discussion.	3	0	6	0	**LO5.**
Week5	First sketches of plans Design of the plans and feedback	3	0	6	0	**LO 8.**

Week-6	Development of plans, Preliminary master plan and feedback	3	0	6	0	**LO 3.**
Week-7	Development of plans, Lectures on Sections and elevations Lectures on Stairs	3	0	6	0	**LO 7**
Week-8	**Midterm Exam.**					
Week-9	Workshop and Development of plans, Preliminary Sections and elevations sketches	3	0	6	0	**LO 4.**
Week-10	Presentation of the 2nd design problem Dissemination of the 3rd program and discussions	3	0	6	0	**LO5., LO 7**
Week-11	Final Design of plans, feedback and discussion	3	0	6	0	**LO 4.**
Week-12	Evaluation and discussion Development of plans and layout.	3	0	6	0	**LO 8.. , LO 7**
Week-13	Development of plans, sections, elevations and layout.	3	0	6	0	**LO 6. , LO 7**
Week-14	Presentation of the 3rd design problem Project submission and feedback	3	0	6	0	**LO 8..LOS 9**
Week 15	**Final Exam.**					

5.3. Experiment Topics: (not applicated)

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

Course Learning Objectives	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8	LO 9
CLO 1	✓	✓		✓					
CLO 2	✓				✓			✓	✓
CLO 3	✓					✓			
CLO 4			✓	✓		✓			
CLO 5							✓	✓	✓
CLO 6			✓	✓			✓	✓	✓
CLO 7	✓	✓			✓	✓	✓		

5- Matrix of Course Objective and LOs

6- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)								
	General	ARC							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Face-to-Face Lecture	✓	✓			✓	✓		✓	
Online Education									
Tutorial/ Exercise	✓	✓	✓			✓		✓	✓
Group Discussion				✓			✓		
Laboratory									
Site Visit	✓	✓							✓
Presentation	✓	✓		✓				✓	
Mini Project					✓	✓	✓		
Research and Reporting	✓		✓	✓		✓	✓	✓	✓
Brain Storming			✓						
Self-Learning				✓	✓			✓	

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Written Exam	✓					✓	✓	✓	✓
Online Exam									
Oral Exam	✓	✓		✓	✓	✓	✓		
Quiz		✓	✓				✓	✓	✓
Lab Exam									
Take-Home Exam			✓				✓	✓	
Research Assignment	✓			✓	✓	✓			
Reporting Assignment		✓						✓	
Project Assignment		✓		✓	✓	✓	✓		✓
In-Class Questions	✓	✓		✓		✓	✓		

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	90 min.
Midterm written Exam (*Term Work*)	**30**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**30**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**10**	According to the schedule	---
Total Mark	**100**	15th	

9- Facilities Required:

A- COMPUTER
B- PRINTER

10- List of References:

10.1. Course Notes:

- Sketches, lecture notes, presentations

10.2. Required Text Books and Additional References:

- Architecture: Form, Space, and Order 4th Edition, by Francis D. K. Ching (Author),2014, Publisher , Wiley, ISBN-13978-1118745083
- Archtects' Data by Ernst Neufert,2012, Fourth Edition language edition published by Blackwell Publishing Ltd 2012,ISBN: 978-1-4051-9253-8
- Time-Saver Standards for Architectural Design,8th Edition,0071432051 · 9780071432054By Michael J. Crosbie, Donald Watson,2005 | Published: December 16, 2004

10.3. Recommended Books:

- Time saver standards for architectural design data ,
  - مجلة عالم البناء
  - مجلة تصميم
  - كتاب تحليل الموقع للدكتور احمد عوف
- Architecture Handbook
- Vocabulary of Architecture
- Egyptain building code

- **10.4. Web Sites:**
  - https://www.fosterandpartners.com/
  - http://www.sagradafamilia.org/en/
  - https://www.skyscrapercity.com/
  - https://www.asla.org/
  - http://www.ekb.eg/ar
  - http://www.architectmagazine.com/

Course Directors	Name	Signature

Teaching staff	**Dr.Mohamed Nabil El Sebai**	
Course coordinator	**Dr.Mohamed Nabil El Sebai**	
Program coordinator	**Dr.Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Essam Said Farag Khalifa**	
Date of approval	**Oct -Jan 2023 – 2024**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 242: Steel Construction

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Steel Construction			**Course Code:**		ARE 242	
Program /level	Architectural Engineering			**SENIOR (2)**			
Term/ Academic year:	oct -Jan 2023 – 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	1	**Tutorial:**	-	**Laboratories:**	3
Pre-Requisite	ARE 212						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Integrate comprehensive knowledge in the formulation of objectives and project innovation in steel construction.
- Use of analytical tools during specialized procedures.
- Identify innovative and appropriate solutions for steel construction.
- Enhance communication within the project teams.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to:

CLO 1. Establish knowledge of steel construction according to Egyptian code.

CLO 2. Interpret general programs and functional relations for steel construction.

CLO 3. Produce projects for steel construction.

CLO 4. Articulate creative and innovative thinking in solving problems and making designs.

CLO 5. Develop effective cooperation within the project work teams.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A1, A2, A7	B3

4- Mapping Course Los to NARS

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**A1.** Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO 1. Establish knowledge of the use of Materials and design workrequired by the structures. LO 2. Classify sections and identifies their character and system.
	A2. Develop and conduct appropriate experimentation and/or simulation, analyses and objective engineering judgment to draw conclusions.	LO 3. Determine the overall functional relationships between type of concrete element in the projects.

	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams	LO 4. Collaborate effectively within the team work, positive communication, presentations and presentations, and leads and motivates the work team.
		LO 5. Develop creative and innovative thinking in problem solving, and in designing products, systems, components and processes.
		LO 7. Recite two types of each of (grade of steel - concrete materials - method of constructions). **LO 8.** Designs reinforced concrete and foundations projects, according to specifications.
	B3. Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.	LO 1. Establish knowledge of the use of Materials and design workrequired by the structures.

		LO 3. Determine the overall Functional relationships between type of concrete Element in the projects. LO 6. Define the symbols and Terminology used in the Reinforced concrete and Foundations designs. LO 7. Recite two types of each of (grade of steel - concrete materials- method of Constructions). LO 8. Design reinforced Concrete and foundations projects, according to specifications.

5- Course Content:

5.1. Course Description (As indicated in program By law):

This course introduces the students the basic aspects of Steel Structures, The different structural elements required for constructing steel structure building, calculating the loads and the Design of different Steel structural elements. Including Properties of steel, specifications, loads, allowable stresses, members subject to centric and eccentric tension compression, roof trusses, riveted connections, bracing, columns and their bases, beams, frames consisting of columns and trusses, frames extending over several halls, brackets, cranes, joints and connections.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Credit Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	Properties of the Steel	2	1	0	0	**LO 2, LO 4, LO 6**
Week-2	General Layout of the Industrial Building	2	1	0	0	**LO 2, LO 4, LO 6**
Week-3	Complete General Layout of the Industrial Building	2	1	0	0	**LO 2, LO 4**
Week-4	Loads and Allowable Stresses	2	1	0	0	**LO 2, LO 7**
Week5	Complete Loads and Allowable Stresses	2	1	0	0	**LO 7**
Week-6	Buckling and Design of Tension members	2	1	0	0	**LO 3, LO 8**
Week-7	Design of Tension members	2	1	0	0	**LO 1, LO 4**
Week-8	**Midterm Exam.**					
Week-9	Design of Compression members	2	1	0	0	**LO 3, LO 5**
Week-10	Design of Compression members	2	1	0	0	**LO 5, LO 8**
Week-11	Design and Details of Steel Connections	2	1	0	0	**LO 5, LO 8**
Week-12	**Quiz 1**	2	1	0	0	**LO 1, LO 3, LO 5, LO 8**
Week-13	Design and Details of Steel Connections	2	1	0	0	**LO 1, LO 3, LO 5, LO 8**
Week-14	Revision.	2	1	0	0	**LO 2, LO 6, LO 7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	------
2nd	----------	------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO 1		√				√	√	
CLO 2	√	√	√					
CLO 3	√	√	√					√
CLO 4					√			√
CLO 5				√				

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)							
	Architectural Engineering							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√	√	√	√	√	√	√	
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	√		√	√	√			√
Group Discussion		√		√	√	√		
Laboratory	-	-	-	-	-	-	-	-
Site Visit				√				
Presentation	√	√		√	√	√	√	
Mini Project	√		√		√			√
Research and Reporting	√	√	√	√		√	√	
Brain Storming		√	√	√	√			√
Self-Learning	-	-	-	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√		√	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√		√		√	√		√
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	√	√	√	√	√	√	√	√
Research Assignment	√	√	√	√		√	√	
Reporting Assignment	√	√	√	√		√	√	
Project Assignment	√		√		√	√		√
In-Class Questions	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (*Term Work*)	**30**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**10**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- STEEL STRUCTURES DESIGN (ALLOWABLE STRESS DESIGN), Dr. ABOELRHMAN KHALIL., First Edition,2009

10.3. Recommended Books:

-
- Design of Steel Structures: By Limit State Method as Per IS: 800 - 2007. 3rd Edition - 15 November 2012. ISBN-13: 978-9382332091 ISBN-10 Design of Steel Structures, By Limit State Method as Per, S.S. Bhavlkattl.

10.4. Web Sites:

Course Directors	Name	Signature
Teaching staff	**Dr. Mahmoud Mohamed Abd alhamed**	
Course coordinator	**Dr. Mohamed Nabil El Sebai**	
Program coordinator	**Dr. Mohamed Nabil El Sebai**	
Head of the Department	**Prof. Essam said khalifa**	
Date of approval	**OCT-JAN (2023 – 2024)**	

The Higher Technological Institute (HTI)	
Department: Department of Architecture Engineering	

Course Specification

ARE 243: Comp .App.In Arch (3).

Program(s) on which this course is given	Architecture Engineering
Department offering the program:	Architecture Engineering
Department offering the course:	Architecture Engineering

A– Basic information

Course Title:	Comp .App.In Arch (3).			**Course Code:**		ARE 243	
Program / level	Architecture Engineering			**SENIOR (2)**			
Term/ Academic year:	Oct–Jan 2023–2024			**Credit Hours:**		2	
Contact Hours:	6	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	6
Pre-Requisite	ARE 213						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Enhance communication between Individuals and machine in 3D programs.
- Use computational facilities, techniques and laboratory in 3d drawings
- Merge knowledge of 3d commands and understanding of Architecture drawings
- Use a wide range of analytical tools and software of 3d during specialized procedures
- Innovative suitable solutions of architecture drawing problems.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Aware professional of 3d Max programme.

CLO 2. Achieve the interpret result in Architectural drawings using specified commands.

CLO 3. Produce drawings in 3d program according to good understanding of 3d software packages of architecture program.

CLO 4. Create 3d modelling of contemporary architectural projects according to professional application of 3d program.

CLO 5. Apply numerical modelling solutions of architecture problems

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A8,A9	B2, B3, B4

4- *Mapping Course Los to NARS*

3- *Mapping Course Los to NARS*

Field	ogram that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	LO1. Communicate to contemporary form by applying 3D Max program . LO2. Use contemporary tools in different 3D Max drawings of architectural projects.

	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	LO3. use creative and flexible thinking in produce 3d Modeling drawings
COMPETENCIES of ARCHITECTURAL ENGINEERING	B2. Produce designs that meet building user's requirements through understanding the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces and needs and between them to human scale.	LO4. Produce designs that meet building user's requirements in spaces and human scales through 3d Modeling drawings
	B3. Generate ecologically responsible , environmental conversation and rehabilitation designs,through understanding of :structural design , construction ,technology ,and engineering problems associated with building designs .	LO5. Generate 3d Modeling drawings consider Structural design ,construction ,technology through

	B4. Transform design concepts into buildings and integrate plans into overall planning within the constraints of project financing ,project management ,cost control and methods of project delivery ,while having adequate knowledge of industries ,organizations ,regulations , and procedures involved .	LO6. Generate 3d Modeling drawings consider project finacing ,cost control . LO7. Produce 3d Modeling drawings consider knowledge of industries ,organizations ,regulations , and procedures involved .

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The use of software in the development of architectural designs, formation, architectural presentation and three- dimensional models.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	General introduction of the 3ds Max program, and the components of the computer that correspond to the capabilities of the Max program to work better + definition of the program's interface and main menus.	6	0	0	6	**LO 1**
Week-2	Introducing the program's main tools for moving, rotation and zooming, and how navigation works within projects, whether internal or external + introducing some importantshortcuts.	6	0	0	6	**LO 1,LO2**.

Week-3	How to insert photos into 3ds max andsee them, Using the tools for drawingthe line and two-dimensional shapes (SP Line Tools) + How to correctly insert a plan from the AutoCAD program into the Max program and see its lines.	6	0	0	6	**LO1,LO2,LO3**
Week-4	How to apply commands to 2D shapesto turn them into 3D shapes, such as: Loft-Lath-Sweep-Bevel Profile-Extrude	6	0	0	6	**LO1,LO2,LO3**
Week5	Explanation of some commands that are applied to 3D models such as: Bend-Taper- Slice-Cap holes- Symmetry-Turbo Smooth	**6**	**0**	**0**	**6**	**LO1,LO2,LO3 ,LO4,LO5**
Week-6	Quiz					
Week-7	Explanation of commands that require a large number of Segments, such as Displace-Cloth-Wave-Ripple -Noise	**6**	**0**	**0**	**6**	**LO1,LO2 ,LO4,LO5**
Week-8	**Midterm Exam.**					

Week-9	Explanation of how to convert 3Dmodels to Editable Poly, through a practical workshop	6	0	0	6	**LO1,LO2,LO3 ,LO4,LO5**
Week-10	Explain the rest of the Editable Poly commands, through a practical workshop.	6	0	0	6	**LO3,LO5**
Week-11	Explanation of Compound Objects.	6	0	0	6	**LO3,Lo4 ,LO5**
Week-12	Explanation of some plugins, and howto install them on the Max program and work with them.	6	0	0	6	**LO3,LO5,LO7**
Week-13	Quiz					

Week-14	Explain how V-Ray Lighting is placed in indoor and outdoor scenes. Explanation of how to put cameras inside the project, and Render settings.	6	0	0	6	**LO1,LO2,LO3 ,LO4,LO5,LO6 ,LO7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	6
2nd	----------	

6- Matrix of Course Objective and LOs

ourse Learning Objectives	Learning Outcomes (LOs)						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
CLO 1	√		√			√	√
CLO 2	√						
CLO 3	√	√					
CLO 4	√		√	√			
CLO 5				√	√	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)						
	ARCHITECURAL ENGINEERING						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Face-to-Face Lecture	√	√	√	√	√	√	√ √
Online Education	--	--	--	--	--	--	-- --
Tutorial/ Exercise	√	√	√	√	√	√	√ √
Group Discussion					√	√	
Laboratory	√	√	√	√	√	√	√
Site Visit	--	--	--	--	--	--	--
Presentation	√			√		√	√
Mini Project	--	--	--	--	--	--	--
Research and Reporting	--	--	--	--	--	--	--
Brain Storming		√	√	√		√	√
Self-Learning	--	--	--	--	√	√	--

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	ARCHITECURAL ENGINEERING						
	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Written Exam	√	√	√	√	√	√	√
Online Exam	--	--	--	--	--	--	--
Oral Exam	--	--	--	--	--	--	--
Quiz	√	√		√	√	√	
Lab Exam	√	√	√	√	√	√	√ √
Take-Home Exam	--	--	--	--	--	--	--
Research Assignment	--	--	--	--	--	--	--
Reporting Assignment	--	--	--	--	--	--	--
Project Assignment	√	√	√	√	√	√	√
In-Class Questions		√	√	√			

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	**15th**	210 min
Midterm written Exam (*Term Work*)	**30**	**8th**	150 min
End of term laboratory exam (*Lab*)	**-**	**-**	**-**
End of term Oral exam	**-**	**-**	**-**
Tutorial and report assessment(*Term Work*)	**20**	**weekly**	**---**
Quizzes/reports/presentation(*Term Work*)	**20**	**According to the schedule**	**---**
Total Mark	**100**		

9- Facilities Required:

A- Projector.
B- Computer.
C- Printer.

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Any book in 3D Max in the libarary in the Institute.

10.3. Recommended Books:

- Auto desk 3ds Max 2021 Complete Reference Guide, Kelly L. Murdock's
- Autodesk 3ds Max 2021 Fundamentals
- Autodesk 3ds Max 2020: A Detailed Guide to Modeling, Texturing, Lighting, and Rendering, 2nd Edition, by Pradeep Mamgain
- Autodesk 3ds Max 2021: A Detailed Guide to Modeling, Texturing, Lighting, and Rendering, 3rd Edition, by Pradeep Mamgain
- 3ds Max Speed Modeling for 3D Artists, by Thomas Mooney
- Kelly L. Murdock's Autodesk 3ds Max 2021 - Paperback, by Murdock Kelly L. – Good
- Kelly L. Murdock's Autodesk 3ds Max 20... by Murdoch, Kelly Paperback / softback

Book Links :

- https://www.ebay.com/itm/364494940071?_trkparms=amclksrc%3DITM%26aid%3D1110018%26algo%3DHOMESPLICE.COMPLISTINGS%26ao%3D2%26asc%3D20230821142934%26meid%3D5fb8c06c5ab646508b26b706e5893310%26pid%3D101196%26rk%3D2%26rkt%3D12%26sd%3D145280989011%26itm%3D364494940071%26pmt%3D1%26noa%3D0%26pg%3D4429486%26algv%3DCompVIDesktopATF2V3WithQueryItemRecallV3&_trksid=p4429486.c101196.m2219&amdata=cksum%3A3644949400715fb8c06c5ab646508b26b706e5893310%7Cenc%3AAAQAIAAABALHyIAEaemKG0mx4REjf%252BHxECBsXtSkNHsCLmXz%252FJyCDeX%252FaDb78456J9CQJiWkf1tgTfr%252FPFYC1gWKGoVwZogxmNc4B8XDh%252FSDBqPXDVN%252FzJBpcHN%252BEkpF3NJHvvVj%252FEjnrD8Gz3Agu32V4PLRSvmlL1I5zkBPWXCHFt9AtVAunsq4%252FwHze0s7vu9ALeAQJhIfEqHa%252F%252FsTCNvnIHaG0%252BK5mQHPlvRXyCQ2VsIK%252FIgQnfuiVhqIfI%252F7OfjTcTQH3%252BlC5GanjBaUHLFkWexSf9mSdQrZaBKj7VWfu3XKN1Y%252FTYtr1ejlzZ8fdNO%252BjK2uC3TJvw4dKl%252FyIBNyMVzLB7ls%253D%7Campid%3APL_CLK%7Cclp%3A4429486&epid=28038638906
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- https://www.ebay.com/itm/125822483095?_trkparms=amclksrc%3DITM%26aid%3D1110018%26algo%3DHOMESPLICE.COMPLISTINGS%26ao%3D2%26asc%3D20230821142934%26meid%3D5fb8c06c5ab646508b26b706e5893310%26pid%3D101196%26rk%3D1%26rkt%3D12%26sd%3D145280989011%26itm%3D125822483095%26pmt%3D1%26noa%3D0%26pg%3D4429486%26algv%3DCompVIDesktopATF2V3WithQueryItemRecallV3&_trksid=p4429486.c101196.m2219&amdata=cksum%3A1258224830955fb8c06c5ab646508b26b706e5893310%7Cenc%3AAQAIAAABALHyIAEaemKG0mx4REjf%252BHxECBsXtSkNHsCLmXz%252FJyCDeX%252FaDb78456J9CQJiWkf1lJOimAE8T%252BV1nqWyxdlLe9Lo4ca57r1Ag1bGUHIhaNUfefJeQGB8WGveQJLTn2%252FrafUEWuABzVJqSLY%252BbZDYIZ6N8UllrdcOhsArIBVttUtfM%252BkdOtRk9iy9eXsyKYhq2NIZ0WobrhYOGgSzqM4LZZGMMUMZyS38dv8RlEmNhlwUXS%252B%252Fjvc%252BDZsixuzYnHFbXfSSrr6TlvoiZ6PvchxzNhBHeViGX0DWpTYmV6WLQqZJZIA8vsj1Q%252BbhzAaR5cAQouEooXLOoycOLm11A1ReaQ%253D%7Campid%3APL_CLK%7Cclp%3A4429486&epid=236786149

- https://www.ebay.com/itm/364542663327?_trkparms=amclksrc%3DITM%26aid%3D1110018%26algo%3DHOMESPLICE.COMPLISTINGS%26ao%3D2%26asc%3D20220808120039%26meid%3Daf6e113fbe5240d19f6bd8d49607893b%26pid%3D101544%26rk%3D10%26rkt%3D25%26sd%3D145280989011%26itm%3D364542663327%26pmt%3D1%26noa%3D0%26pg%3D4406038%26algv%3DCompVIDesktopATF2V3WithQueryItemRecallV3%26fpg%3D0&_trksid=p4406038.c101544.m1851&amdata=cksum%3A364542663327af6e113fbe5240d19f6bd8d49607893b%7Cenc%3AAQAIAAABALHyIAEaemKG0mx4REjf%252BHxECBsXtSkNHsCLmXz%252FJyCDV9Ot3JsbflDBQK2JRgzJiaHyU5uMebNkcr%252B28Cmpw7dh2nHa5r9EdoqA0Ce5onYAohWM49rmzys769I3uDFxI9FqTOkSkOiR3aXgKAsQl21pgB20ho%252BLytfqkA22Ks2w1u2xFATUVHKbGnDjvtEcvdUOeVCdJwLBjNyaVC29KvSYT%252F7tULk0wGvADFs58QJYGojDmpvrnWTpvTD%252F37bDfY0aNCA78rjPr%252Bv5UOzYQE%252FFvfsBWQgW931bBAfLHbJ1q9i9xctBg4qM3lxLg%252FJDEBXYSYPch5ts64YKpzGWjT8%253D%7Campid%3APL_CLK%7Cclp%3A4406038&epid=28050397648

10.4. Web Sites:

- www.autodisk.com

Course Directors	Name	Signature
Teaching staff	**Assistant Professor / Ashraf Moustafa Labib**	
Course coordinator	**Assoc. Prof. Sahar Ezz El Arab Ramadan**	
Program coordinator	**Dr. Mohamed Nabil El Sbaie**	
Head of the Department	**Dr .Prof. Essam Kalifa**	
Date of approval	**Oct -Jan 2023 – 2024**	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 244: Environmental Control

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Environmental Control			**Course Code:**		ARE 244	
Program /Level	Architectural Engineering			**SENIOR (2)**			
Term/ Academic year:	Oct.-Jan.2023 - 2024			**Credit Hours:**		2	
Contact Hours:	3	**Lecture:**	1	**Tutorial:**	2	**Laboratories:**	-----
Pre-Requisite	ARE 153						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Understand the influence of solar radiation and natural ventilation on architectural and urban design.
- Explore the geographical relationship between the sun and the Earth.
- Explore methods to control solar rays' impact on architectural structures.
- Analyze wind movements and develop strategies for architectural control of airflow between buildings.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Develop architectural plans integrating solar radiation and natural ventilation considerations.

CLO 2. Supervise the implementation of environmental control strategies in architectural designs.

CLO 3. Collaborate within multidisciplinary teams to devise ecologically responsible architectural solutions.
CLO 4. Design architectural solutions considering the relationship between environmental elements and human comfort.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A6, A7	B2, B3

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contributes to achieve.	Learning Outcomes (LOs)
COMPETENCIES of ENGINEERING	A.6: Plan, supervise, and monitor implementation of engineering projects, considering other trades' requirements.	LO5: Apply multidisciplinary approaches to create ecologically responsible architectural designs for desert regions.
	A.7. Function efficiently as an individual and as a member of multidisciplinary and multicultural teams.	LO3: Evaluate desert-specific architectural components to address environmental challenges.
COMPETENCIES of ARCHITECTURE	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	LO1: Analyse the impact of desert climate factors on architectural design decisions. LO4: Synthesize the relationship between human needs, building design, and the desert environment.
	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	LO2: Integrate passive cooling and solar techniques into architectural solutions for desert regions. LO3: Evaluate desert-specific architectural components to address environmental challenges.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

This course emphasize on the important role of solar radiation, natural ventilation as of major climate elements affecting architecture &urban design. Which includes; sun and the Geographical relations between sun & Earth in addition to, methods of defining sun angles at different points on Earth during different days & hours of the year. Architectural control of sun rays on buildings. Air: Study of movements of wind: & architectural control of air movements in & between buildings.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction to Environmental Control and Geographical Relations.	2	1	2	0	**LO1**
Week-2	Conduction: thermal mass and Heat transfer (surface and material)	2	1	2	0	**LO1**
Week-3	Solar Radiation Understanding and Sun Angle Calculation. Shading Design Climate Analysis. The sun path diagram	2	1	2	0	**LO1, LO3**
Week-4	Architectural Control of Solar Rays Natural illumination **Quiz**	2	1	2	0	**LO3**
Week5	Convection: Architectural Control of Air Movements. And wind pressure Wind Catchers, courts, and Natural ventilation.	2	1	2	0	**LO2, LO4**
Week-6	Evaporations and humidity control and comfort zone	2	1	2	0	**LO4**
Week-7	Integration of Environmental Strategies. In hot humid, hot dry and moderate climate	2	1	2	0	**LO1, LO5**
Week-8	**Midterm Exam.**					
Week-9	Case Studies. Integration of Environmental Strategies.	2	1	2	0	**LO1, LO5**

Week-10	Case Studies following up. Integration of Environmental Strategies.	2	1	2	0	**LO1, LO5**
Week-11	Students Presentation	2	1	2	0	**LO1,LO4**
Week-12	Students Presentation	2	1	2	0	**LO1,LO4**
Week-13	Project semi final	2	1	2	0	**LO1,LO4, LO5**
Week-14	Final Project submission	2	1	2	0	**LO1,LO4, LO5**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and Los

Course Learning Objectives	Learning Outcomes (LOs)				
	LO 1	LO 2	LO 3	LO 4	LO 5
CLO 1	√	√			
CLO 2		√			
CLO 3			√		√
CLO 4				√	

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)			
	General		ARECHITECTURE	
	A6	A7	B2	B3
	LO5	LO3	LO1, LO4	LO2, LO3
Face-to-Face Lecture	✓	✓	✓	✓
Online Education				
Tutorial/ Exercise	✓	✓	✓	✓
Group Discussion	✓			
Laboratory				
Site Visit				
Presentation			✓	
Mini Project	✓	✓	✓	✓
Research and Reporting	✓	✓		
Brain Storming	✓		✓	
Self-Learning				

8- Assessment

- Individual Research.
- Group Research.
- Exercise sheets.
- Presentations.
- Mini Project.

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)			
	General		ARECHITECTURE	
	A6	A7	B2	B3
	LO1, LO2	LO3	LO4	LO5
Written Exam	✓▪	✓	▪✓	✓▪
Online Exam				
Oral Exam				
Quiz	✓	✓		
Lab Exam				
Take-Home Exam				
Research Assignment	✓	✓		
Reporting				▪

Assignment	✓	✓	✓	✓
Project Assignment	✓	✓	✓	✓
In-Class Questions	✓	✓	✓	✓

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**		
End of term Oral exam	**-**		
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Lecture hall
B- laptop and Data show for presentation
C- Architectural software programs, simulation program, etc.

10- List of References:

10.1. Course Notes:

- Lecture notes Available (handed to students part by part).

10.2. Required Text Books and Additional References:

a. Givoni, B. (2009). Climate Considerations in Building and Urban Design (2nd ed.). New York: Routledge.
b. CIBSE Guide A: Environmental Design (2015). Chartered Institution of Building Services Engineers.
c. de Dear, R.J., & Brager, G.S. (2018). Thermal Comfort in Naturally Ventilated Buildings: Relevance of Indoor Air Velocity and Surface Temperature. Building Research & Information, 46(6), 682-696.
d. Solar Energy: Fundamentals and Applications (2019). Edited by Soteris Kalogirou. Academic Press.

10.3. Websites/Online Sources:

a. PLEA (Passive and Low Energy Architecture) International. (Website). Available at: https://www.plea-arch.org/resources/

b. Architectural Science Review. (Journal). Taylor & Francis. Available at: https://www.tandfonline.com/toc/tasr20/current .
c. Solar Energy Journal. (Journal). Elsevier. Available at: https://www.journals.elsevier.com/solar-energy
d. Society of Building Science Educators. Climate Consultant. Available at: https://www.sbse.org/resources/climate-consultant
e. SunEarthTools. Available at: https://www.sunearthtools.com

Course Directors	**Name**	**Signature**
Teaching staff	DR. Ghada Mohamed Amin Assal	
Course coordinator	DR. Ghada Mohamed Amin Assal	
Program Coordinator	Dr. Mohamed M. Elsebaay	
Head of the Department	Prof. Essam Khalifa	
Date of approval	Oct.-Jan.2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 245 : Execution Designs (2)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Execution Designs (2)			**Course Code:**		ARE 245	
Program / level	Architectural Engineering			**Senior (2)**			
Term/ Academic year:	Oct -Jan 2023 - 2024			**Credit Hours:**		3	
Contact Hours:	5	**Lecture:**	1	**Tutorial:**	4	**Laboratories:**	0
Pre-Requisite	ARE 152 , ARE 226						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Detailed studies of: Advanced structural systems with wide-span structures.
- Technical Systems and installations (Suspended Ceilings, Rised Floors, Marble Floors, Marbel Claddings, Curtain Walls, Wooden Claddings and Metal Claddings), Electromechanical installations for Elevators and Ducts.
- Preparations of working drawings completely detailed and ready for execution including architectural drawings, details, structural sections. etc.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Preparing integrated architectural engineering drawings, ready for implementation, in Advanced structural systems with wide-span structures.

CLO 2. Preparing complete detailed drawings, for most complex sconstructional elements, in the building.

CLO 3. The ability to choose the structural system, and the distribution of the structural elements in the building, in a way that maintains the quality of architectural design.

CLO 4. Reviewing engineering drawings and coordinating between engineers from otherdisciplines related to architectural work.

CLO 5. The ability to communicate with workers and technicians related to theimplementation of various architectural works in the building.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of Achitecture
Program Academic Standards that the course contributes in achieving	A4, A7, A9	B1, B3, B5

4- Mapping Course Los to NARS

Field	Program (CBEs) that the coursecontribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 1.** Choose the best contemporary technologies and Techniques, in preparing architectural details.
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 2**. Review the work of other related engineering disciplines, and assisting in finding solutions and treatments for any negative effects on the building design (as a result of these works).
	A.9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO 3**. Choose alternatives and ideas that achieve the required design ideain a way: easier to implement, less in cost and easier to furnish.

COMPETENCIES of Architecture	B.1 Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**LO 4**. Combine dimensions of the human body, spatial and functional needs, spaces of movement, work, and performance of activities.
	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 5.**. Developing structural systems and techniques, and distribution of the structural elements in proportion to the design of the building.
	B.5 Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO 6.** Formulate role of architect in design and implementation stages of the building, and relationship between consultant, owner andcontractor.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The course deals with preparing execution design drawings for more sophisticated projects taking into consideration the different technical systems and installations. Advanced structural systems, as well as, electromechanical ducts and spatial requirements are introduced through the study of the course. Application on student's own design project, from previous semester, enriches the study in order to teach the student how to develop design concepts to real projects. The course takes care of the coordination process between the different technical systems, included in the project, on one hand, and the different execution documents and drawings, on the other. The course aims to apply BIM systems and programs in presentation of the project using computer aided programs. (Revit)

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	▪ Architect professional and his relation with other engineering specialises. ▪ Co-ordinate and reconcile contradictions between executive architectural drawings, and executive drawings for other specialties related to project • .Enumerate project stages	3	1	4	0	**LO 1** **LO 2**
Week-2	**Advanced structural systems** (part One)	3	1	4	0	**LO 4.** **LO 1.**
Week-3	**Advanced structural systems** (part Two) Technical Systems and installations:	3	1	4	0	**LO 3.** **LO 4.** **LO 2.**

Week-4	**Preparing an executive architectural details, for : Suspended Ceilings** (part One) ▪ **Quiz 1**	3	1	4	0	**LO 4.** **LO 5.** **LO 6.**
Week5	Technical Systems and installations: **Preparing an executive architectural details, for Suspended Ceilings** (part two)	3	1	4	0	**LO 2.** **LO 4.** **LO 5.** **LO 6.**
Week-6	Technical Systems and installations: **Preparing an executive architectural details, for Floors Details (Rised Floors)**	3	1	4	0	**LO 2.** **LO 4.** **LO 5.** **LO 6.**
Week-7	Technical Systems and installations: **Preparing an executive architectural details, for Floors Details (Marble Floors)**	3	1	4	0	**LO 2.** **LO 4.** **LO 5.** **LO 6.**
Week-8	**Midterm Exam.**					
Week-9	Technical Systems and installations: **Preparing an executive architectural details, for Marbel Claddings**	3	1	4	0	**LO 2.** **LO 4.** **LO 5.** **LO 6.**
Week-10	Technical Systems and installations: **Preparing an executive architectural details, for Curtain Walls**	3	1	4	0	**LO 2.** **LO 4.** **LO 5.**
Week-11	▪ Technical Systems and installations: ▪ **Quiz 2**	3	1	4	0	**LO 2.** **LO 4.** **LO 5.** **LO 6.**
Week-12	Technical Systems and installations: **Preparing an executive architectural details, for Metal Claddings**	3	1	4	0	**LO 2.** **LO 4.** **LO 6.**
Week-13	Electromechanical installations: **Preparing an executive architectural details, for Elevators and Ducts**	3	1	4	0	**LO 2.** **LO 4.** **LO 5.**
Week-14	▪ Revision on details	3	1	4	0	**LO 1.** **LO 4.**

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	.....
2nd	NA	.....

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
CLO 1	√	--	√	-	√	√
CLO 2	-	√	-	√	√	√
CLO 3	√	-	√	√	-	√
CLO 4	-	√	-	√	√	√
CLO 5	-	√	-	√	√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)					
	Architectural					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Face-to-Face Lecture	√	√	√	√	√	√
Online Education	---	---	---	---	---	---
Tutorial/ Exercise	√	√	√	√	√	√
Group Discussion	---	---	---	---	√	√
Laboratory	---	---	---	---	---	---
Site Visit	---	---	---	---	---	---
Presentation	√	√	√	√	√	√
Mini Project	√	√	√	√	---	√
Research and Reporting	---	√	---	---	---	---
Brain Storming	---	---	√	√	---	---
Self-Learning	√	---	---	---	√	---

8- Assessment

Assessment Methods	*Learning Outcome*(LOs)					
	Architectural					
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6
Written Exam	√	√	√	√	√	√
Online Exam	---	---	---	---	---	---
Oral Exam	---	---	---	---	---	---
Quiz	√	√	---	---	√	√
Lab Exam	---	---	---	---	---	---
Take-Home Exam	---	---	---	---	---	---
Research Assignment	---	√	---	√	---	---
Reporting Assignment	---	---	---	---	---	---
Project Assignment	√	√	√	√	√	√
In-Class Questions	---	√	---	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam	**30**	15th	210 min.
Midterm written Exam	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial, researches and project assessment	**20**	weekly	---
Quizzes	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Projector
B- Computer
C- Whiteboard

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Any book in Execution designs & Architectural details in the libarary of institute.

10.3. Recommended Books:

- Ramsey & Sleeper, Architectural Graphic Standards, The American Institute of Architects, John Wiley & Sons, Inc., New Jersey, U.S.A., 11th Edition, Student Edition: Edited by Bruce Bassler, 2008.
- Francis D. K. Ching, Building Construction Illustrated, John Wiley & Sons, Inc., New Jersey, U.S.A., 4th edition, 2008.
- Edward Allen & Patrick. Rand, Architectural Detailing (Function / Constructibility Aesthetics), John Wiley & Sons, Inc., New Jersey, U.S.A., 2nd edition, 2007.

- هشام حسن على. دكتور, التصميمات التنفيذية, مكتبة دار المعرفة, القاهرة, مصر, الإصدار الثانى, 9109 م.
- فاروق عباس حيدر. دكتور, الموسوعة الحديثة فى تشييد المبانى الجزء الثانى: الأسقف والتشطيبات وخدمات- المبانى, منشأة المعارف, الإسكندرية, مصر, الطبعة السادسة.
- فاروق عباس حيدر. دكتور, الموسوعة الحديثة فى تشييد المبانى الجزء الثالث: الهندسة الصحية والتركيبات- الصحية, منشأة المعارف, الإسكندرية, مصر, الطبعة الثامنة, 9112 م. 9191 م

Course Directors	Name	Signature
Teaching staff	Dr. Mohamed Ahmed Mahmoud	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	
Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct .- Jan 2023-2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE246 : Air Conditioning in Buildings

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Mechanical Engineering

A– Basic information

Course Title:	Air Conditioning in Buildings			**Course Code:**		ARE 246	
Program / level	Architectural Engineering			**SENIOR (2)**			
Term/ Academic year:	Jan.-May 2022 - 2023			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	0	**Tutorial:**	4	**Laboratories:**	-----
Pre-Requisite	ARE 226						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Introduction to heating, ventilation, and air conditioning (HVAC) systems
- History of HVAC systems
- Design objectives of the HVAC systems
- Introduction to Psychometric and air conditioning processes
- Dissecting HVAC Systems.
- Factors affect selection of the central air conditioning systems-
- All-air air conditioning system
- Air duct design, principles, and considerations
- Heat gain and cooling load. Load Calculations and Weather Conditions.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Recall a range of concepts and principles of heating, ventilation, and air conditioning systems.

CLO 2. Recognize a group of characteristics of different HVAC components, on the local level.

CLO 3. Apply theoretical knowledge, principles, standards in designing HVAC systems.

CLO 4. Employ design requirements, codes, and regulations to produce functional buildings and designs.

CLO 5. Communicate efficiently to convey ideas numerically and graphically.

Communicate efficiently to convey ideas numerically and graphically.	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARC
Program Academic Standards that the course contributes in achieving	A1, A2, A6, A7	B2, B3

3- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**A1.** Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	LO1.Identify the basics to heating, ventilation, and air conditioning (HVAC) systems. Energy and Power (Refrigeration Ton….etc.). Clausius statement and thermal Devices (Heat pump+ summer air conditioner).
	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 basics to heating, ventilation, and air conditioning (HVAC) systems. LO 2. develop the formation and function . And analyze the general requirements and cooling circuits

	A.6. Plan, supervise and monitor the implementation of engineering projects, taking into consideration other trades Requirements.	LO 2. develop the formation and function . And analyze the general requirements and cooling circuits
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	LO 2. develop the formation and function . And analyze the general requirements and cooling circuits
COMPETENCIES of ARC	**B2.** Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 3** Apply theoretical knowledge, principles, standards in designing HVAC systems. **Lo 4** Employ design requirements, codes, and regulations to produce functional buildings and designs.
	B.3.Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**Lo 4** Employ design requirements, codes, and regulations to produce functional buildings and designs.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Air conditioning: Psychometric charts, physical and physiological principles, fundamentals of heat transfer, duct design, heating and cooling cycles.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction to heating, ventilation, and air conditioning (HVAC) systems.	4	-	4	-	**LO1**
Week-2	Energy and Power (Refrigeration Ton….etc.).	4	-	4	-	**LO1**
Week-3	Clausius statement and thermal Devices (Heat pump+ summer air conditioner).	4	-	4	-	**LO1**

Week-4	Air Conditioners basic cycles : Vapor compression cycle+ Vapor absorption cycle.	4	-	4	-	**LO2**
Week5	Ventilation fans and Air filtration	4	-	4	-	**LO2**
Week-6	Different categorizations of Air Conditioning systems.	4	-	4	-	**LO2**
Week-7	Unitary air Conditioners	4	-	4	-	**LO1 , LO2**
Week-8	**Midterm Exam.**					
Week-9	Semi Central air conditioners (Package +VRF…etc)	4	-	4	-	**LO3**
Week-10	Central All air systems Air/Water systems.	4	-	4	-	**LO4**
Week-11	Heating Equipment and Cooling equipment	4	-	4	-	**LO4**
Week-12	Psychometric and air conditioning processes.	4	-	4	-	**LO3**
Week-13	Building Survey for Heat gain and Thermal load estimation	4	-	4	-	**LO4**
Week-14	Load Calculations and Weather Conditions	4	-	4	-	**LO4**
Week 15	Final Exam					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)			
	LO 1	LO 2	LO 3	LO s4
CLO 1	✔	✔		✔
CLO 2	✔		✔	
CLO 3	✔	✔		
CLO 4			✔	✔

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)			
	General		ARE	
	LO 1	LO 2	LO 3	LO 4
Face-to-Face Lecture	✓	✓	✓	✓
Online Education	–	–	–	–
Tutorial/ Exercise	✓	✓	✓	✓
Group Discussion	✓	✓	✓	–
Laboratory	–	–	–	–
Site Visit	–	–	–	–
Presentation	–	✓	–	–
Mini Project	✓	–	–	–
Research and Reporting	–	✓	✓	–
Brain Storming	✓	–		–
Self-Learning	✓	–	✓	–

8- Assessment:

8.1. Course Assessment Methods:

Assessment Method	Week	Course CLOs Covered by Assessment Method	Assessment Weight / Percentage
Midterm Exam	8	1,2,3,4	20%
Quizzes	5,12	1,2,3,4	20%
Assignments	2-6,8-14	1,2,3,4,5	20%
Final Exam	16	1,2,3,4	40%

Assessment Methods	***Learning Outcome*(LOs)**			
	LO 1	LO 2	LO 3	LO 4
Written Exam	✔	✔	✔	✔
Online Exam	–	–	–	–
Oral Exam	–	–	–	–
Quiz	✔	✔	✔	–
Lab Exam	–	–	–	–
Take-Home Exam	–	–	✔	–
Research Assignment	✔	–	–	✔
Reporting Assignment	✔	✔	✔	
Project Assignment	–	✔	–	✔
In-Class Questions	✔	✔	–	✔

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- White Board
B- Laptop & Data show
C- Ms Teams
D- Internet

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- Reddy, T.A., Kreider, J.F., Curtiss, P.S., & Rabl, A. (2016). Heating and Cooling of Buildings: Principles and Practice of Energy Efficient Design (3rd ed.).

10.3. Recommended Books:

- M. Elnaggar and M.Alnahhal "Central Air Conditioning: Systems and Applications" Low-temperature Technologies. IntechOpen, 2019.

10.4. Web Sites:

- EKB (Egyptian Knowledge Bank)

Course Directors	Name	Signature
Teaching staff	**Dr. Mohamed. Ashraf Eid Mohamed**	
Course coordinator	**Dr.M.M.Raouf**	
Program coordinator	**Dr. Mohamed M. Elsebaay**	
Head of the Department	**Prof. Essam Khalifa**	
Date of approval	Oct.-Jan.2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architecture Engineering	
Course Specification	
ARE 251: Environmental Design	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Environmental Design			**Course Code:**		ARE 251	
Program / Level	Architectural Engineering			**Senior(2)**			
Term/ Academic year:	Oct./Jan. 2023 - 2024			**Credit Hours:**		3	
Contact Hours:	6	**Lecture:-**	-	**Tutorial:**	6	**Laboratories:**	-----
Pre-Requisite	ARE 241, ARE 244						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Integrate Practical Skills: Apply theoretical knowledge practically by integrating structural, mechanical systems, and environmental considerations into architectural projects.
- Analyze Environmental Factors: Analyze and assess environmental aspects within architectural designs and construction practices, emphasizing sustainability and green architecture.
- Synthesize Design Elements: Synthesize spatial and formative elements while addressing environmental requirements and landscaping concerns in architectural projects.
- Utilize Technological Tools: Computer application programs and environmental simulation tools enhance the design process and solutions.

2- Course Learning Objectives (CLO):

At the end of this course, students should be able to :

CLO1: **Analyze Realistic Architectural Problems:** Evaluate and dissect realistic architectural problems by integrating structural, mechanical systems, and environmental considerations.

CLO2: **Synthesize Environmental-Focused Solutions:** Integrate environmental aspects, sustainability, and green architecture principles into synthesized solutions for architectural challenges.

CLO3: **Apply Construction Laws and Regulations:** Apply knowledge of construction laws and regulations effectively within architectural design projects.

CLO4: **Utilize Technological Tools:** Demonstrate proficient use of computer applications and environmental simulation programs for architectural analysis and design purposes.

CLO5: **Evaluate Spatial and Environmental Dynamics:** Assess and evaluate spatial configurations and environmental dynamics to optimize design solutions in architecture.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARCHITECTURE
Program Academic Standards that the course contributes to achieving	**A2, A6, A7, A8**	**B1, B2, B3**

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contributes to achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**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 analytical methods to explore comparable case studies and conduct site programming for analysis.
	A.6. Plan, supervise and monitor the implementation of engineering projects, taking into consideration other trades Requirements.	**LO1.** Collaborate effectively in team-based research activities.
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO1.** Collaborate effectively in team-based research activities. **LO6.** Interpret project guidelines and effectively gather data for project elements and site analysis. **LO7.** Enhance aesthetics, architectural integrity, and urban identity positively.
	A.8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary Tools.	**LO2.** Present and articulate concepts, designs, or construction methods from historical architecture.
COMPETENCIES of ARCHITECTURE	**B.1** Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**LO8.** Implement green architecture principles in desert environments using passive cooling, local materials, and desert landscaping practices.

	B.2 Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO3.** Analyze the evolution of architecture and buildings over time. **LO5.** Differentiate various architectural styles and characteristics
	B.3. Generate ecologically responsible, environmental conservation and rehabilitation designs through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 4.** Apply analytical methods to explore comparable case studies and conduct site programming for analysis. **LO 8.** Implement green architecture principles in desert environments using passive cooling, local materials, and desert landscaping practices.

Course Content:

5.1. Course Description (As indicated in the program Bylaw):

The course aims to address Studies of architectural project related to realistic problems with integratio of structure, mechanical systems, environmental aspects, sustainability and green architecture an application of construction laws. Students learn how to analyze and then synthesize the various issues space and form with special emphasis on environmental requirements and landscaping. Studio wor includes lectures, perspectives and workshop models. Using computer application program related t environmental simulation programs is essential for this course.

5.2. Course Topics/hours/Los Matrix

Week No.	***Topic***	***Total Hours***	***Contact hrs***			***LOs Covered by Course***
			Lec.	**Tut.**	**Lab.**	
Week -1	Definitions & types of environmental system. Start report research Term project hand-out, data gathering for the project elements and project site	6	0	6	0	**LO1, LO6**
Week-2	Lectures & notes on environmental and social issues. Continue report research.	6	0	6	0	**LO1**
Week-3	Studies of similar situations & case studies Programming site analysis.	6	0	6	0	**LO4**
Week-4	Site planning address problems related to the environment	6	0	6	0	**LO7**
Week5	Lecture on vernacular architecture. Feedback and Submission of 1st design sketches then dissemination of the	6	0	6	0	**LO2, LO5**

	+ updated program					
Week-6	Feedback and Submission of design sketches	6	0	6	0	**LO2**
Week-7	Lecture on green arch. Design development. Sketch design on final plans and site sections	6	0	6	0	**LO2, LO3, LO8**
Week-8	**Midterm Exam.**					
Week-9	Quiz	6	0	6	0	**LO3, LO5-LO7**
Week-10	Project follow up	6	0	6	0	**LO7**
Week-11	Final review of sections, fenestrations, and 3 D studies	6	0	6	0	**LO3, LO5-LO7**
Week-12	Lectures on urban design, contextual issues, and landscape concept	6	0	6	0	**LO7**
Week-13	Final development of elevations	6	0	6	0	**LO7**
Week 14	final jury of the project.	6	0	6	0	**LO7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	.....	.....
2nd	.....	.....

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
CLO 1	√			√				
CLO 2		√	√		√		√	√
CLO 3				√				
CLO 4				√		√		
CLO 5					√		√	√

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)							
	Architecture Engineering							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√	√	√	√	√	√	√	√
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	√		√	√	√			√
Group Discussion		√						
Laboratory	-	-	-	-	-	-	-	-
Site Visit					√			
Presentation	√				√	√	√	√
Mini Project	√	√	√	√	√	√	√	√
Research and Reporting	√							
Brain Storming		√	√	√	√			√
Self-Learning	-	-	-	-	-	-	-	-

8- Assessment

9-

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√	√	√	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√		√		√	√		√
Lab Exam	-	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	√	√	√	√	-
Research Assignment	√	√	√	√		√	√			√
Reporting Assignment	√	√	√	√		√	√			√
Project Assignment	√	√	√	√		√	√			√
In-Class Questions	√	√	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**15**	15th	Committee
Tutorial and report assessment (*Term Work*)	**15**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**10**	14th	60 min
Total Mark	**100**		

9- Facilities Required:

A- White board.
B- Projector.
C- Computer.

10- List of References:

10.1. Course Notes:

- Lecture notes
- Presentation of the students at the class

10.2. Required Text Books and Additional References:

- Neufert, Ernst, Neufert, Peter. 2012. Neufert Architects' Data, Fourth Edition. Published by Wiley-Blackwell.

10.3. Recommended Books:

- ابو عوف،طارق. 2014. تحليل الموقع. مؤسسة سكاي للكتاب
- ابو عوف،طارق. 2015. المبدأ التصميمي. مؤسسة سكاي للكتاب
- McHarg IL. Design with Nature. Wiley; 1995.
- Berge B. The Ecology of Building Materials. Routledge; 2009.
- Kwok A, Grondzik W. The Green Studio Handbook: Environmental Strategies for Schematic Design. Routledge; 2011.
- Bergman D. Sustainable Design: A Critical Guide. Princeton Architectural Press; 2012.
- Moskovitz JT. The Greenest Home: Superinsulated and Passive House Design. Princeton Architectural Press; 2013.
- Bell VB, Rand P. Materials for Design. Princeton Architectural Press; 2014.
- Contal MH, Favre D. Sustainable Design: Towards a New Ethic in Architecture and Town Planning. Birkhäuser; 2018.

- Steiner F, Weller R. Design with Nature Now. University of Pennsylvania Press; 2019.

10.4. Web Sites:

- ArchDaily. ArchDaily. [Internet]. Available from: www.archdaily.com
- Green Building Advisor. Green Building Advisor. [Internet]. Available from: www.greenbuildingadvisor.com
- U.S. Green Building Council (USGBC). USGBC. [Internet]. Available from: www.usgbc.org
- World Green Building Council (WorldGBC). WorldGBC. [Internet]. Available from: www.worldgbc.org
- Treehugger. Treehugger. [Internet]. Available from: www.treehugger.com

Course Directors	Name	Signature
Teaching staff	**Dr.Hesham Hassan**	
Course coordinator	**Dr. Ghada Assal**	
Program coordinator	**Dr. Mohamed M. Elsebaay**	
Head of the Department	**Prof. Essam Khalifa**	
Date of approval	Oct.-Jan.2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 252: Surveying

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Surveying			**Course Code:**	ARE 252		
Program / level	Architectural Engineering			Senior (2)			
Term/ Academic year:	oct -Jan 2023 – 2024			**Credit Hours:**	2		
Contact Hours:	4	**Lecture:**	1	**Tutorial:**	0	**Laboratories:**	3
Pre-Requisite	-----						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Develop methods through the knowledge of modern science and technologyand use them in the field.
- Solve measurement problems in an optimal way.
- Identify the relative position of any objects or points of the earth.
- Determine the distance and angle between different objects.
- Prepare a map or plan to represent an area on a horizontal plan.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Identify research, define and recognize survey terminology, maps and symbol usages.

CLO 2. Define, interpret and research basic survey terminology.

CLO 3. Identify mapping legends and symbols.

CLO 4. Interpret and compare the different types of survey maps.

CLO 5. Determine surveying mistakes, accuracy, and precision.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARC
Program Academic Standards that the course contributes in achieving	A1, A2, A7	B4

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**A1. I**dentify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**LO 1.** Identify common types of survey instruments and equipment. **LO 2**. Interpret the functions of various types of surveying instruments and equipment.

		LO 3. Recognize and name survey instruments and equipment.
	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.	**LO 4**. Relate functions of survey instruments and equipment to surveying methods and applications **LO 5.** Draw boundary survey using property descriptions
	A7. Function efficiently as an individualand as a member of multi-disciplinary and multicultural teams.	**LO 6. Construct** survey using profile measurement from field notes.
COMPETENCIES of ARCHITECCTURA LENGINEERING	**B4.** Transform design concepts into buildings and integrate plans into overall planning within the constraints of project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	**LO7**. Proficient in the use of Methods of measuring **LO 8**. Differentiate between different types of surveying instruments and demonstrate the ability to use various types of surveying instruments and equipment

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Plane & geodesic surveying, triangulation points kinds of maps , longitudinal & diagonal scales & enlarging maps . Pantograph & Areas. To provide an introduction to engineering surveying includes units and scale , mapping , linear measurements , closed traverse computations and adjustment , leveling , contouring maps , calculation of area , types of bearings , and the use of theodolite in measuring horizontal and vertical angles .

5.2. Course Topics/hours/Los Matrix

Week No.	***Topic***	***Total Hours***	***Contact hrs***			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week -1	Introduction to surveying, units and scale.	4	1	0	3	**LO 8**

Week-2	Mapping using linear measurements: filed reconnaissance, traverse points, Skelton measurements, tie lines, booking, and description cards.	4	1	0	3	**LO 5**
Week-3	Calculations of irregular areas: average method, trapezoidal method, and Simpson method.	4	1	0	3	**LO 8**
Week-4	Closed traverse: observations, adjustment using Bowditch method.	4	1	0	3	**LO 6**
Week5	Leveling: concept, bench mark, datum	**4**	1	0	3	**LO 7**
Week-6	level instrument and its parts, setting up of level.	4	1	0	3	**LO 7**
Week-7	Contouring: definition, characteristics, contour map.	4	1	0	3	**LO6 , LO7**
Week-8	**Midterm Exam.**					
Week-9	Contouring: definition, characteristics, contour map.	4	1	0	3	**LO 3**
Week-10	Computation of earthwork: cut and fill volumes.	4	1	0	3	**LO 5**
Week-11	Closed loop leveling, methods of calculations: rise and fall method, height of instrument method, mathematical checks of leveling.	4	1	0	3	**LO 4**
Week-12	Theodolite: parts of theodolite, temporary adjustment.	**4**	1	0	3	**LO 2**
Week-13	Horizontal and vertical angles measurements and calculations	4	1	0	3	**LO 1**
Week-14	Horizontal and vertical angles measurements and calculations	4	1	0	3	**LO 1**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	NA	
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8
CLO 1		√				√	√	
CLO 2	√	√	√					
CLO 3	√	√	√					√
CLO 4					√			√
CLO 5				√				

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)							
	General	ARCHITECCTURAL ENGINEERING						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture						√		
Online Education	-	-	-	-	-	-	-	-
Tutorial/ Exercise	√		√	√	√			√
Group Discussion		√		√	√	√		
Laboratory	√	√	√	√	√	√	√	√
Site Visit				√				
Presentation	√	√		√	√	√	√	
Mini Project	√		√		√			√
Research and Reporting	√	√	√	√		√	√	
Brain Storming		√	√	√	√			√
Self-Learning	-	-	-	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)							
	General						ARE	
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√	√	√		√	√	√	√
Online Exam	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-
Quiz	√		√		√	√		√

Lab Exam	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Take-Home Exam	√	√	√	√	√	√	√	√
Research Assignment	√	√	√	√		√	√	√
Reporting Assignment	√	√	√	√		√	√	√
Project Assignment	√		√		√	√		
In-Class Questions	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Projector
B- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

10.3. Recommended Books:

- Engineering Surveying,**By W Schofield, Mark Breach, 2015, Elsevier,6th Ed**
- Surveying with Construction Application. Barry, F. Kavanagh,2010
- J.F.A. Moore (ed), Monitoring Building Structures (Blackie, Glasgow and London, 1992, ISBN-13**978-0216931411**

10.4. Web Sites:

Course Directors	Name	Signature
Teaching staff	Dr. Ramy Mostafa mohamed	
Course coordinator	Dr.Mohamed Nabil El Sebai	
Program coordinator	Dr.Mohamed Nabil El Sebai	
Head of the Department	Prof. Essam Said Farag Khalifa	
Date of approval	Oct -Jan 2023 – 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architecture Engineering	
Course Specification	
ARE 253: Graduation Project	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Graduation Project			**Course Code:**		ARE 253	
Program / Level	Architectural Engineering			**Senior (2)**			
Term/ Academic year:	May-Aug 2022-2023			**Credit Hours:**		4	
Contact Hours:	8	**Lecture: -**	0	**Tutorial:**	8	**Laboratories:**	0
Pre-Requisite	ARE 241						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Promote decision making skills by project selection and justification.
- Demonstrate students' ability to define an architectural project, acknowledge the varied scales of resolution appropriate to the task and take responsibility for managing the process to complete the project on schedule.
- Identify techniques of design and planning.
- Contribute to research by conducting a complete theoretical Studies of their project related to realistic problems with the integration of structure, mechanical systems, and environmental aspects related to the Architecture and Construction industry.
- Evaluate the environment's social, economic, and spatial aspects through design and planning.
- Develop professional communication and interpretation at various levels of the audience.
- Provide solutions to construction, building technology and engineering.

2- Course Learning Objectives (CLO):

At the end of this course, students should:

CLO 1. Equip students with the knowledge accumulated from all other courses.

CLO 2. Use critical arguments, hypotheses, concepts, and data in reaching decisions and solving architecture issues creatively.

CLO 3. Participate in planning, design, and implementation of large-scale architecture projects.

CLO 4. Apply acquired knowledge and skills in further professional and academic development.

CLO 5. Use quantitative and qualitative research methodology.

CLO 6. learn technology and work methods in architecture.

CLO 7. Evaluate project accessible, aesthetics, cost-effective, functional/operational, historic preservation, productive, secure/safe, and sustainable to create a high-performance building/Urban context.

CLO 8. Describe architecture ethics and regulations underpinning the profession.

CLO 9. Examine the overall perception of the urban environment: urban context, environmental and social factors in design.

. *Relationship between the course and the Competencies:*

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of Architectural Engineering
Program Academic Standards that the course contributes to achieving	A2, A3, A5, A6,A7,A8,A9	B1, B2,B3,B4,B5

3- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contributes to achieving	Learning Outcomes (LOs)
COMPETENCIES of ENGINEERING	**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 conclude.	**LO4.** Deduct the project size, design criteria, elements, and components.
	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**. Demonstrate Studies of similar situations and case studies. Then, Compare and differentiate between architectural characters. **LO4.** Deduct the project size, design criteria, elements, and components. **LO5.** Select an appropriate Site location and size and Programming site analysis. **LO6.** Identify the land use and zoning through Surveying and site visits.
	A5. Practice research techniques and methods of investigation as an inherent part of learning.	**LO5.** select an appropriate Site location and size and Programming site analysis. **LO7.** Evaluate architecture, urban and surrounding environment. **LO9.** Explain the construction and materials of earlier architecture. **LO10.** Present and explain using technology, sustainability, and smart materials.

	A6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO7.** Evaluate architecture, urban and surrounding environment. **LO9.** Present and explain the construction and materials of earlier architecture.
COMPET ENCIES of Architecture	**A7.** Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO10.** Present and explain using technology, sustainability, and smart materials.
	A8. Communicate effectively – graphically, verbally and in writing – with various audiences using contemporary tools.	**LO1.** Apply the technical writingof the proposal. **LO2.** Thesis technical writing and Data gathering using various reliable, trusted resources. **LO3**. Demonstrate Studies of similar situations and case studies. Then, Compare and differentiate between architectural characters. **LO5.** Select an appropriate Site location and size and Programming site analysis. **LO6.** Identify the land use and zoning through Surveying and site visits. **LO12.** Develop the presentation skills in defense to present the final work using all tools.
	A9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO8.** Present concepts and ideas of design. **LO9.** Explain the construction and materials of earlier architecture. **LO10.** use technology, sustainability, and smart materials. **LO11.** Contribute positively to the aesthetic, architecture, and urban identity.
COMPET ENCIES of Architectur e	**B1.** Create architectural, urban, and planning designs that satisfy aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and	**LO8.** Present concepts and ideas of design. **LO9.** Explain the construction and materials of earlier architecture. **LO10.** use technology, sustainability, and smart materials. **LO11.** Contribute positively to the

	human sciences.	aesthetic, architecture, and urban identity.
COMPET ENCIES of Architecture	**B2**. Produce designs that meet building users' requirements through understanding the relationship between people and buildings and between buildings and their environment, and the need to relate buildings and the spaces between them to human needs and scale	**LO7.** Evaluate architecture, urban and surrounding environment. **LO8.** Present concepts and ideas of design. **LO9.** Explain the construction and materials of earlier architecture. **LO10.** use technology, sustainability, and smart materials. **LO11.** Contribute positively to the aesthetic, architecture, and urban identity.
	B3. Generate ecologically responsible, environmental conservation and rehabilitation	**LO7.** Evaluate architecture, urban and surrounding environment. **LO8.** Present concepts and ideas of design. **LO9.** Explain the construction and materials of earlier architecture. **LO10.** use technology, sustainability, and smart materials. **LO11.** Contribute positively to the aesthetic, architecture, and urban identity.
	B4. Transform design concepts into buildings and integrate plans into overall planning within the constraints of project financing, project management, cost control and project delivery methods while having adequate knowledge of industries, organizations, regulations, and procedures.	**LO8.** Present concepts and ideas of design. **LO9.** Explain the construction and materials of earlier architecture. **LO10.** use technology, sustainability, and smart materials. **LO11.** Contribute positively to the aesthetic, architecture, and urban identity.

5- Course Content:

5.1. Course Description (As indicated in the program Bylaw):

The students should achieve the following assignments on two consecutive semesters:

The first semester will be reserved for project selection and research; that includes an independent investigation on the topic of the project, (data gathering, analysis, programming, site information etc.). A comprehensive report containing all collected data should be presented for evaluation at the end of the semester. The second semester will be reserved for architectural design: Application of all accumulated knowledge from previous courses should be demonstrated. The students are allowed to choose their own projects, subject to the approval of the final project committee.

5.2. Course Topics/hours/Los Matrix

Week No.	Topic	Total Hours	Contact hrs.			Los Covered by Course
			Lec.	Tut.	Lab.	
First semester (Theoretical Part)						
Week -1	Collecting project applications (a registration proposal includes three project proposals, the reasons for choosing them, their importance to the country's plan, and the site proposals)	8	-	8	_	
Week-2	Discuss the student's proposals for the site and the project and choose the appropriate location with the signatures of both the student and the supervisor.	8	-	8	_	LO1, LO2
Week-3	Start report research Term project hand-out, data gathering for the project elements and site.	8	-	8	_	LO2
Week-4	An analytical study of similar international projects (at least three projects)	8	-	8	_	LO3.
Week5	Continue report research.	8	-	8	_	LO2, LO3, LO7
Week-6	Study of similar situations and case studies, Programming site analysis.	8	-	8	_	LO2, LO3, LO4, LO5, LO6, LO7
Week-7	Site planning addresses problems related to the environment	8	-	8	_	LO5, LO6, LO7
Week-8	Discuss the proposed program for the components of the project. Study the standards and design criteria of the project components and elements.	8	-	8	_	LO4, LO7
Week-9	Analytical study of the site (roads - entrances - orientation - contour) - environmental studies	8	-	8	_	LO4, LO5, LO6, LO7
Week-10	An analysis of the elements of the project and the functional relationships between them) zoning)	8	-	8	_	LO4, LO5, LO6, LO7

Week-11	Architecture data and criteria	8	-	8	_	LO4, LO5, LO6, LO7
Week-12	Area and spaces	8	-	8	_	LO4.
Week-13	Site analysis	8	-	8	_	LO4, LO5, LO6, LO7
Week-14	Zoning	8	-	8	_	LO6, LO7
Week 15	Primitive design stage	8	-	8	_	LO6 , LO7, LO8
Week 16	Following up	8	-	8	_	LO2, LO6, LO7, LO8
Week 17	Following up	8	-	8	_	LO2, LO6, LO7, LO8
Week 18	Final Thesis submission					
Second semester (Practical Part)						
Week -1	Reviewing the environmental studies of the site, the concept, and the project objective. The program and the number of masses in the layout.	8	-	8	_	LO4, LO7, LO8.
Week-2	Layout &3d mass	8	-	8	_	LO7, LO8, LO10, LO11
Week-3	Master Plan	8	-	8	_	LO8, LO10, LO11
Week-4	Plans + Section	8	-	8	_	LO8, LO9, LO10, LO11
Week5	Plans + Section + Elevation	8	-	8	_	LO8, LO9, LO10, LO11
Week-6	Final (Plans + Section + Elevation)	8	-	8	_	LO8, LO9, LO10, LO11
Week-7	Semifinal	8	-	8	_	LO12
Week-8	Final Project submission					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	.....	.....
2nd	.....	.....

- - - - - - - - -

6- Matrix of Course Objectives and LOs

Course Learning Objectives	Learning Outcomes (LOs)											
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO10	LO11	LO12
CLO 1	√	√	√	√	√	√	√	√	√	√	√	√
CLO 2	√	√	√	√	√	√	√	√				
CLO 3								√	√	√	√	
CLO 4	√	√	√	√	√	√	√	√	√	√	√	√
CLO 5	√	√	√	√	√	√	√					
CLO 6	√	√	√	√	√	√	√			√		√
CLO 7			√	√	√	√	√		√	√		
CLO 8			√		√	√	√				√	
CLO 9								√	√	√	√	

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome* (LOs)											
	Architecture Engineering											
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO10	LO11	LO12
Face-to-Face Lecture	√	√	-	-	-	-	-	-	√	√	√	-
Online Education	-	-	√	√	√	√	√	√	-	-	-	-
Tutorial/ Exercise	√	√	√	√	√	√	√	√	√	√	√	-
Group Discussion	√	√	-	-	-	-	-	-	-	-	-	-
Laboratory	-	-	-	-	-	-	-	-	-	-	-	-
Site Visit	-	-	-	-	-	√	-	-	-	-	-	-
Presentation	√	√	√	√	√	√	√	√	-	-	-	-
Mini Project	-	-	√	√	√	√	√	√	-	-	-	-
Research and Reporting	√	√	√	√	√	√	√	√	-	-	-	-
Brainstorming	√	-	-	-	-	-	-	-	-	-	-	-
Self-Learning	-	√	√	√	√	√	√	√	-	-	-	√

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)											
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO10	LO11	LO12
Written Exam	-	-	-	-	-	-	-	-	-	-	-	-
Online Exam	-	-	-	-	-	-	-	-	-	-	-	-
Oral Exam	√	√	√	√	√	√	√	√	√	√	√	√
Quiz	-	-	-	-	-	-	-	-	-	-	-	-
Lab Exam	-	-	-	-	-	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	-	-	-	-	-	-	-	-	-
Research Assignment	√	√	√	√	√	√	√	√	√	√	√	-
Reporting Assignment	-	-	-	-	-	-	-	-	-	-	-	-
Project Assignment	-	-	-	-	-	-	-	√	√	√	√	-
In-Class Questions	√	√	-	-	-	-	-	-	-	-	-	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (Defense)	**40**	8th	30 min. Committee
Midterm written Exam (*Term Work*)	**-**	**-**	
End-of-term laboratory exam (*Lab*)	**-**	**-**	
Oral exam and submissions	**20**	**weekly**	
Follow up	**20**	**weekly**	
Project Thesis submission	**20**	End of Project 1st semester	
Total Mark	**100**		

9- Facilities Required:

A- White board.
B- Projector.
C- Computer.

10- List of References:

Course Notes: Lectures to the students, Presentation of the students at the class.

Essential books (textbooks):

- Neufert, E., Jones, V., Thackara, J. (1988). Architects' Data. United Kingdom: Wiley.
- Emmitt, S. (2014). Design Management for Architects. Philippines: Wiley.
- Pressman, A. (2014). Designing Relationships: The Art of Collaboration in Architecture. United Kingdom: Taylor & Francis.
- Specialized books on various building types

Recommended books

- Time-saver Standards for Building Types. (1980). United Kingdom: McGraw-Hill.
- Architecture Competition: Project Design and the Building Process. (2017). United Kingdom: Taylor & Francis.

Periodicals, websites, etc.

- www.EKB.eg
- www.green architecture .com

Course Directors	Name	Signature
Teaching staff	All Teaching staff	
Course coordinator	Dr. Ghada Mohamed Amin Assal	
Program Coordinator	Prof. Osama Ahmed Ibrahim Masoud	
Head of the Department	Prof. Osama Ahmed Ibrahim Masoud	
Date of approval	May-Aug (2022-2023)	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 254: Town Planning (B)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Town Planning (B)			**Course Code:**		ARE 254	
Program / level	Architectural Engineering			**SENIOR (2)**			
Term/ Academic year:	Oct-Jan 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	0	**Tutorial:**	4	**Laboratories:**	0
Pre-Requisite	ARE 224						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Explain strategic planning in formulating goals and creating projects
- develop analytical tools during specialized procedures.
- Create innovative and appropriate solutions to urban planning problems.
- develop communication within the project teams

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Explain strategic planning in all its aspects.

CLO 2. Collect data and do a SWOT Analysis

CLO 3. Identify goals and strategies, form alternatives, and put forward projects.

CLO 4. Produce planning and design projects for new and existing sites.

CLO 5. develop Creative and innovative thinking in solving problems and making designs

CLO 6. Develop the project through teamwork

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A3,A4,A6,A7	B1,B2,B4

4- *Mapping Course Los to NARS*

Field	Program that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 1.** Explain the principles and basics of strategic planning **LO 2.** Analyze the interactions between environmental, urban, social, and economic aspects
	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 3.** develop cooperation within the teamwork

	A.6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**LO 4.** identify tasks and resources efficiently.
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 5.** develop creative and innovative thinking in problem solving, and in designing products, systems, components and processes.
COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B1.** Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies and human sciences.	**LO6.** prepare the SWOT Analysis **LO 7.** identify objectives And strategies, forms alternatives, and defines the basis and evaluation criteria for choosing the optimal alternative. **LO 8.** Design new and existing sites considering legislation and building requirements
	B2. Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 9.** Apply evidence of planning and design work required by the design . **LO 8.** Design new and existing sites considering legislation and building requirements

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	Total Hours	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	Introduction to the curriculum - introduction + first project (replanning of an existing area) groups.	4	0	4	0	**LO 1**
Week-2	Regional, Environmental and Urban Studies	4	0	4	0	**LO 2**
Week-3	Social Studies - Economic Studies	4	0	4	0	**LO 2**
Week-4	SWOT Analysis	4	0	4	0	**LO 6, LO 9**

Week5	Objectives - strategies - projects + solution scenarios - scenario evaluation	4	0	4	0	**LO 7**
Week-6	Student presentations (objectives - strategies - projects + solution scenarios - scenario evaluation)	4	0	4	0	**LO 3, LO 7**
Week-7	The proposed scheme + giving thenew project (planning a new city) + searching for new cities (individual project – research groups)	4	0	4	0	**LO5, LO 6, LO 7, LO 8**
Week-8	**Midterm Exam.**					
Week-9	Presentation of the research + explanation of the analytical studies + defining the planning criteria and the project program	4	0	4	0	**LO3, LO 6, LO 9**
Week-10	Plan Idea - Land Use	4	0	4	0	**LO 7, LO 8**
Week-11	Explanation of the proposed schema description elements	4	0	4	0	**LO 8**
Week-12	**Quiz 1:** semi final	4	0	4	0	**LO5, LO 6, LO 7, LO 8**
Week-13	Final project	4	0	4	0	**LO5, LO 6, LO 7, LO 8**
Week-14	Revision.	4	0	4	0	**LO1, LO 3, LO 6**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	------
2nd	----------	------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7	LO 8	LO 9
CLO 1	√		√					√	√
CLO 2		√		√	√	√		√	√
CLO 3						√	√		
CLO 4	√	√		√	√			√	
CLO 5					√				√
CLO 6	√	√	√	√			√	√	

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs) Architectural Engineering								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Face-to-Face Lecture	√	√	√	√	√	√	√	√	√
Online Education	-	-	-	-	-	-	-	-	-
Tutorial/ Exercise		√	√		√	√	√	√	√
Group Discussion			√	√		√	√	√	
Laboratory	-	-	-	-	-	-	-	-	-
Site Visit		√	√						
Presentation			√	√	√		√	√	
Mini Project			√		√	√	√	√	√
Research and Reporting			√	√					
Brain Storming	√					√	√	√	
Self-Learning	-	-	-	-	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome* (LOs)								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Written Exam	√	√		√	√	√	√	√	√
Online Exam	-	-	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	-	-	-	-
Quiz	√	√			√	√	√	√	
Lab Exam	-	-	-	-	-	-	-	-	-
Take-Home Exam	√	√	√	√	√	√	√	√	√
Research Assignment	√	√	√			√		√	√
Reporting Assignment	√	√		√	√	√	√	√	
Project Assignment	√	√			√	√	√	√	
In-Class Questions	√	√	√	√	√	√	√	√	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**30**	15th	210 min.
Midterm written Exam (*Term Work*)	**30**	8th	150 min.
End of term laboratory exam (*Lab*)	**-**	-	-
End of term Oral exam	**-**	-	-
Tutorial and report assessment (*Term Work*)	**15**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**25**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Whiteboard
B- Projector
C- Computer

10- List of References:

10.1. Course Notes:

- Lecture notes

10.2. Required Text Books and Additional References:

- **CARMONA, Matthew. Public places urban spaces: The dimensions of urban design. Routledge, 2021.**
- **Planning Methodology and History by Wegener-2009**
- **WATES, Nick; THOMPSON, John. The Community Planning Event Manual: How to use collaborative planning and urban design events to improve your environment. Routledge, 2013.**
- **Red Sea Life Project, United State Agency for International Development , Chemonics International, Septemper 2007.**
- **Planning and Urban Design StandarA Planners Dictionary by Michael Davidsods by Emina Sendich (Editor); American Planning Association Staff -2006**
- **International Institute for Management Development", World Competitiveness, IMD, Yearbook, Lousanne, 2002.**

10.3. Recommended Books:

- **زايد عبد الله, محمود; محمود. أسس التخطيط المرن المستدام: رؤية مستقبلية لمفهوم المدينة البطيئة .آفاق عربية و إقليمية.221-206 :8.14 ,2023 ,**
- **محمد, داليا السيد; داليا السيد. مواصفات المدن الذكية وأثرها على تخطيط المدن فى المستقبل. Journal of the Egyptian Society of Engineers, 2020, 59.1: 52-44.**
- **عبد الفتاح, فاطمة جمال الدين; فاطمة جمال الدين. أسس ومعايير التخطيط البيئي للمجتمعات العمرانية المستدامة حالة النسق الصحراوي بالواحات المصرية-25 :58.3 ,2019 ,Journal of the Egyptian Society of Engineers . 20.**

10.4. Web Sites:

- **http: //www.investment.gov.eg.**
- **http://www.evdata.worldbank.org**
- **http://www.worldbank.org**
- **http://www.world economic fourm.org\index**

Course Directors	Name	Signature
Teaching staff	Dr.Mohamed Riad	
Course coordinator	Dr. maysa selim	
Program coordinator	Dr.Mohamed Nabil	

Head of the Department	Prof. Esam Khalifa	
Date of approval	Oct-Jan 2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architecture Engineering	

Course Specification

ARE 255: Execution documents & Specification

Program(s) on which this course is given	Architecture Engineering
Department offering the program:	Architecture Engineering
Department offering the course:	Architecture Engineering

A– Basic information

Course Title:	Execution documents & Specification			**Course Code:**		ARE 255	
Program / level	Architecture Engineering			**SENIOR (2)**			
Term/ Academic year:	Oct -Jan 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	1	**Tutorial:**	-	**Laboratories:**	3
Pre-Requisite	ARE 244						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- the preparation of a complete set of execution documents of a given project; containing large span elements designed by the student.
- To provide an introduction to the adjudication's procedures the specification's writing rules of the building work and items and the rules of surveying quantities of the building work and items.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Learn the preparation of a complete set of execution documents of a given project

CLO 2. To provide an introduction to the adjudication's procedures the specification's writing

CLO 3. Understanding of rules of the building work and items and

CLO 4. Identify the rules of surveying quantities of the building work and items.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A2, A3, A4	B5

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	A.2. 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.	**LO 1**. Determine For Specifications and Account the Quantities For project executive. LO 2. Differentiate Schedules of work Specifications
	A.3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 3**. Describe Measurement methods for the various engineering

	A.4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 4.** Compare Different methods of inventory quantities LO5. Assess Preparatory phase of project.
COMPETENCIES of ARE	B.5 Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO6.Discriminate Consultants/Contractors/Suppliers Corner: Submission of tenders.** **LO 7** Explain General Condition of the Construction Contract

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

the course ensures that graduates have an awareness of architectural and urban regulations, as well as ethical responsibility in the field of architectural engineering. Show examples of codes, laws, and construction rules. Recognize and demonstrate professional practise rules and legislation in terms of rights, responsibilities, and ethics. Introduces pupils to fundamental case studies involving construction rules and regulations. Explain the architect's, contractor's, and owner's roles during the design and building stages. Recognize the many sorts of contracts

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	

Week -1	Preparatory phase of project.	4	1	0	3	**LO 1, LO5**
Week-2	Consultants/ Contractors/ Suppliers Corner: Submission of tenders.	4	1	0	3	**LO 6**
Week-3	General Condition of the Construction Contract.	4	1	0	3	**LO 7**
Week-4	Special Construction of the Contraction Contract.	4	1	0	3	**LO 4**
Week5	**Quiz 1**					
Week-6	Schedules of work items and quantities.	4	1	0	3	**LO 3**
Week-7	Training for students.	4	1	0	3	**LO 6 , LO1**
Week-8	**Midterm Exam.**					
Week-9	Schedules of work Specifications	4	1	0	3	**LO 2**
Week-10	Measurement methods For the various engineering Different methods of inventory quantities.	4	1	0	3	**LO 3**
Week-11	**Quiz 2**					
Week-12	Preparation For Specifications and Account the Quantities For project executive	4	1	0	3	**LO 1, LO 7**
Week-13	Training for Students.	4	1	0	3	**LO 7**
Week-14	Revision	4	1	0	3	
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	———	———
2nd	———	———

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)						
	LO 1	LO 2	LO 3	LO s4	LO 5	LO 6	LO 7
CLO 1					√		
CLO 2		√	√	√			
CLO 3						√	√
CLO 4							

7- Course Teaching and Learning Methods:

Teaching and Learning Methods			*Learning Outcome*(LOs)				
	Architectural Engineering						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Face-to-Face Lecture	√	√	-	√	√	-	√
Online Education	-	-	-	-	-	-	-
Tutorial/ Exercise	√	-	-	√	-	-	-
Group Discussion	-	-	√	-	-	-	-
Laboratory	-	-	-	-	-	-	-
Site Visit	-	-	-	-	-	-	-
Presentation	√	-	-	-	-	√	-
Mini Project	√	-	-	-	-	-	√
Research and Reporting	-	-	√	-	-	√	√
Brain Storming	-	-	-	-	√	-	-
Self-Learning	-	-	-	-	-	-	-

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)						
	Architectural Engineering						
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7
Written Exam	√	√	√	-	-	-	√
Online Exam	-	-	-	-	-	-	-
Oral Exam	-	-	-	-	-	√	-
Quiz	-	-	-	√	√	-	-
Lab Exam	-	-	-	-	-	-	-
Take-Home Exam	-	-	-	-	-	-	-

Research Assignment	√	-	-	-	-	-	-
Reporting Assignment	√	-	-	√	-	√	-
Project Assignment	-	-	-	-	-	-	-
In-Class Questions	√	-	√	√	-	-	√

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Seminar room
B- laptop and Data show for presentation
C- Lecture hall

10- List of References:

10.1. Course Notes:

- Lecture notes

Available (handed to students' part by part

10.2. Recommended Books:

- قانون البناء 119 - لسنة 2008 ولائحته التنفيذية المطابع الاميرية2016 م.
- عبد الفتاح السيد القصبي، حساب كميات الأعمال الإنشائية،دار الكتب العلمية ، 2015
- عبد الرشيد إبراهيم نصير، إدارة مشروعات التشييد، دار النشر للجامعات، 2010.

Course Directors	Name	Signature
Teaching staff	Dr. Hesham Hassan Awaad	
Course coordinator	Dr. Bassem Mohamed EL-sayed Kandel	

Program coordinator	Dr. Mohamed Nabil El Sebai	
Head of the Department	.Prof. Essam Sayed Farag Khalifa	
Date of approval	Oct .- Jan 2023-2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

ARE 256: Acoustics & Illumination

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:				**Course Code:**		ARE 256	
Program / Level	Architectural Engineering			**SENIOR (2)**			
Term/ Academic year:	Oct-Jan 2023 - 2024			**Credit Hours:**		2	
Contact Hours:	4	**Lecture:**	0	**Tutorial:**	4	**Laboratories:**	0
Pre-Requisite	ARE 226						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

1. Acoustics:
   - Definition of architectural acoustics and its significance in buildings.
   - Concepts and terminologies related to sound wave behavior in enclosed spaces.
   - Study audible sound waves and their architectural implications in internal and external spaces.
   - Techniques for handling sound architecturally: isolation, absorption, and reflection.
   - Materials used for sound management.
   - Distribution of speakers in various spaces.
   - Understanding acoustical defects and objectives for successful acoustics design.
2. Artificial Illumination:
   - Physics of light, terminologies, and definitions.
   - Luminance measurements and understanding light sources.
   - Design considerations for artificial lighting quantity.
   - Integrating artificial lighting with daylighting in interior spaces based on functionality and activities.

2- Course Learning Objectives (CLO):

At the end of this course, students should be able to :

CLO 1. Learn Definitions of architecture acoustics

CLO 2. Understanding of Acoustics of enclosure

CLO 3. Identify the behavior of sound waves in enclosures, sound absorption, sound reflections, and sound isolation.

CLO 4. Treatment of the acoustical defects, the concepts, and objectives of the successful acoustics design.

CLO 5. Learning of Artificial illumination: physics of light, terminology, and definitions.

CLO 6. Knowledge of measurements of luminance, light sources, designing for artificial lighting quantity, and integration with daylighting.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A6, A7	B2, B3

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contributes to achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING	**A.6**. Plan, supervise and monitor the implementation of engineering projects, taking into consideration other trades Requirements.	**LO 1.** Identify sound absorption coefficient, uses of sound absorbing materials
	A.7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**LO 2**. solve acoustical defect. **LO4**. Application of illumination acoustics principle public building.

COMPETENCIES OF ARE	**B2.** Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale.	**LO 3**. Learn how to use Sound insulation in buildings. **LO 7**. Understanding Artificial lighting methods and systems .
	B.3. Generate ecologically responsible, environmental conservation and rehabilitation designs through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO4.** Apply illumination acoustics principles in public buildings. **LO5.** Identify the factors that affect sound. **LO6.** Learn the design of the acoustical auditorium, Sound amplification system. **LO7.** Understand artificial lighting methods and systems. **LO8.** Prepare acoustical design, Room Acoustical requirements.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Acoustics: Definition of architectural acoustics and its importance in buildings, concepts and terminologies, behavior of sound waves in enclosures, sound absorption, sound reflections, sound isolation, the acoustical defects, the concepts and objectives of the successful acoustics design. Artificial illumination: physics of light, terminology and definitions. Luminance measurements, light sources, designing for artificial lighting quantity, integration with day lighting.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week -1	Introduction, definitions	4	0	4	0	**LO 2, LO3**
Week-2	Classification of sound	4	0	4	0	**LO 3**
Week-3	Factors affect the Sound	4	0	4	0	**LO 5**
Week-4	Musical sounds and noise	4	0	4	0	**LO 4**
Week5	Sound insulation, absorption and reflection	4	0	4	0	**LO 4**
Week-6	Measurement of sound insulation, uses of sound insulation materials	4	0	4	0	**LO 1**
Week-7	Distribution of speakers within the spaces according to the type of space	4	0	4	0	**LO1, LO6 , LO8**
Week-8	**Midterm Exam.**					
Week-9	Light definition and properties	4	0	4	0	**LO 7**
Week-10	The Importance of Architectural Lighting	4	0	4	0	**LO 7**
Week-11	Development of architectural lighting through ages	4	0	4	0	**LO 4**
Week-12	What is Human Centric Lighting (HCL)?	4	0	4	0	**LO 7**
Week-13	Between Light and Shadow: Exploring Lighting to Create Atmospheres in architecture.	4	0	4	0	**LO 7**
Week-14	Types of artificial lighting in architecture	4	0	4	0	**LO 4 , LO7**
Week 15	**Final Exam.**					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	An experiment to test the sound insulation of some materials	3
2nd		

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
CLO 1	√				√			
CLO 2		√						√
CLO 3			√		√			
CLO 4		√		√			√	
CLO 5	√				√			√
CLO 6	√				√			

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome* (LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Face-to-Face Lecture	√							
Online Education			√					
Tutorial/ Exercise					√			
Group Discussion					√			
Laboratory								
Site Visit						√		
Presentation	√	√	√			√		√
Mini Project			√					
Research and Reporting								√
Brain Storming				√				
Self-Learning				√				

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)							
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8
Written Exam	√				√			
Online Exam								
Oral Exam			√					
Quiz					√			
Lab Exam								
Take-Home Exam		√		√		√		√
Research Assignment			√					√
Reporting Assignment							√	√
Project Assignment		√		√		√		√
In-Class Questions			√					

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Final Exam (*written*)	**40**	15th	90 min.
Midterm written Exam (*Term Work*)	**20**	8th	60 min.
End of term laboratory exam (*Lab*)	**-**	15th	Committee
End of term Oral exam	**-**	15th	Committee
Tutorial and report assessment (*Term Work*)	**20**	weekly	---
Quizzes/reports/presentation (*Term Work*)	**20**	According to the schedule	---
Total Mark	**100**		

9- Facilities Required:

A- Seminar room, workshop room and drawing studio
B- laptop and Data show for presentation
C- Lecture hall

10- List of References:

10.1. Course Notes:

- Lecture notes, Available (handed to students' part by part).

10.2. Required Text Books and Additional References:

- *Egan, M.D. 1988. Architectural Acoustics. McGraw Hill.*
- *Stein, R., Reynolds, J., McGuiness, P. 1986. Mechanical and Equipments for Buildings. 7th ed. John Wiley and Sons.*

10.3. **Recommended Books:**

- Everest, F. A., & Pohlmann, K. C. (2009). Master Handbook of Acoustics (6th ed.). McGraw-Hill Education.
- Mardaljevic, J. (2012). Daylighting: Natural Light in Architecture (2nd ed.). Routledge.
- Long, M. (2017). Architectural Lighting Design (2nd ed.). Routledge.
- Tohmatsu, K. (2003). Lighting Design Basics. John Wiley & Sons.
- Kuttruff, H. (2009). Room Acoustics (5th ed.). CRC Press.
- Michael Ermann, Architectural Acoustics Illustrated , John Wiley & Sons
    - Architectural construction Details.
    - Egyptian Code.
    - Architectural construction pr.M. Ahmed Abodalla.

10.4. Web Sites:

- Acoustic Architects. Acoustic Architects - High-End Home Automation & Home Theater. https://www.acousticarchitects.net/.
- Acoustical Consultants. Acoustical Consultants - Environmental and Architectural Acoustic Design. https://www.acoustical-consultants.com/.

Course Directors	Name	Signature
Teaching staff	**DR.Hesham Hassam**	
Program coordinator	**Dr. Mohamed M. Elsebaay**	
Head of the Department	**Prof. Essam Khalifa**	
Date of approval	Oct.-Jan.2023 - 2024	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

FTR 131: Field Training (1)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Field Training (1)			**Course Code:**	FTR 131		
Program /level	Architectural Engineering			**Sophomore year**			
Term/ Academic year:	MAY-AUG (2022-2023)			**Credit Hours:**	3		
Contact Hours:	18	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	18
Pre-Requisite	ITR 031+ 45 units						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- ✓ Describe the technical principles of the various workshops. (A building workshop - an armed carpentry workshop - an armed blacksmith workshop - a tile workshop - a paint workshop - a plumbing workshop - a conch workshop)

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Identify the different phases (of construction) and follow up on their sequence.

CLO 2. Describe the raw materials used and their handling methods.

CLO 3. Apply manual training if possible.

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A3, A4, A8, A9, A10,	B3, B4, B5

3- ***Mapping Course Los to NARS***

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING GRADUATE	**A3.** Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 1**. Apply engineering design processes to produce cost-effective solutions that meet specific needs by learning about different building materials and their handling methods within the principles and contexts of sustainable design and development.
	A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 2.** Develop students' ability to use objective engineering judgment to draw conclusions and apply them on-site. **LO 3.** Familiarize health and safety requirements, compliance with environmental issues, and risk management principles.
	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**LO 4.** Identify the expected engineering problems and how to avoid them during the construction phases
	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO 5**. Discover contemporary technologies, rules of practice, standards, and quality guidelines in various workshops.
	A10. Acquire and apply new knowledge and practice self, lifelong, and other learning strategies.	**LO 6.** Apply research techniques, whereby each student submits a set of reports, then detailed research at the end of the semester on what he has practiced during the training period.
COMPETENCIES of ARCHITECTURAL ENGINEERING	**B3.** Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 7**. Acquire the ability to activate self-learning strategies through scientific research and suggested training sites
	B4. Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project	**LO 8**. Create designs that meet the requirements of building users through the selection of appropriate materials and construction methods.

	management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	
	B5. Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO 9**. Identify of structural design, construction, technology, and engineering problems associated with building designs. **LO 10**. Explain the technical assets of the different workshops

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The training semester consists of 7 weeks with a total of 18 hours\week. This first training is taken at training centers to be exposed to all different workshops under the supervision of professional trainers. Periodical progress reports have to be submitted, every two weeks, by the student to his training supervisor, along with a final report. Follow-up visits by the training supervisors from the department should be scheduled, and their communication with the center's supervisors is essential part of the evaluation process.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week (1-3)	• Identifying the technical assets of the building workshop, armed carpentry and armed blacksmithing + submitting a report at the end of the week to the supervisor + manual training if possible.	18	0	0	18	LO 1: LO10
Week (4)	Midterm Exam					
Week (5-7)	• Identifying the technical assets of the tile workshop, shellfish workshop, paint workshop, plumbing workshop + submitting a report at the end of the week to the supervisor + manual training if possible.	18	0	0	18	LO 1: LO10
Week-8	Final Exam. Submission of the final report + discussion of the training with a committee of faculty members and the supporting staff.					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	---------
2nd	----------	---------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)									
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
CLO 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLO 2	✓	✓	✓				✓	✓	✓	
CLO 3	✓	✓	✓	✓	✓	✓		✓		✓

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)									
	General							ARE		
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
Face-to-Face Lecture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Online Education										
Tutorial/ Exercise	✓						✓	✓	✓	✓
Group Discussion		✓			✓	✓				
Laboratory										
Site Visit	✓	✓	✓	✓	✓	✓		✓		✓
Presentation							✓	✓	✓	
Mini Project										
Research and Reporting	✓						✓		✓	
Brainstorming										
Self-Learning	✓	✓	✓				✓		✓	✓

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)									
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
Written Exam										
Online Exam	✓	✓	✓	✓	✓	✓			✓	✓
Oral Exam	✓	✓	✓	✓	✓	✓			✓	✓
Quiz	✓	✓			✓	✓			✓	
Lab Exam										
Take-Home Exam										
Research Assignment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reporting Assignment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Project Assignment										
In-Class Questions	✓	✓	✓	✓	✓	✓				✓

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Commitment to attendance	**10**	**Weekly**	—
Tutorial and report assessment (*Term Work*)-follow up-	**20**	**Weekly**	—
mid term	**20**	**Week 4**	—
Final Report	**20**	**Week 8**	—
End of term Oral exam- discussion-	**30**	**Week 8**	—
Total Mark	**100**	-	—

9- Facilities Required:

✓ All the capabilities of the site available during the training period, and the number and tools

10- List of References:

10.1. Course Notes:

- Observations during the training period from the supervisors on site and the teaching staff.

Course Directors	Name	Signature
Teaching staff	Teaching staff	
Course coordinator	Dr. Ghada Assal	
Program coordinator	**Prof. Osama Ahmed Ibrahim Masouad**	
Head of the Department	**Prof. Osama Ahmed Ibrahim Masouad**	
Date of approval	MAY-AUG (2022-2023)	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	
Course Specification	
FTR 161: Field Training (2)	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Field Training (2)			**Course Code:**		FTR 161	
Program / level	Architectural Engineering			**Junior year**			
Term/ Academic year:	MAY-AUG (2022-2023)			**Credit Hours:**		3	
Contact Hours:	18	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	18
Pre-Requisite	FTR 131+ 80 units						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Distribute the sites and factories of the major companies to confirm the theoretical information through practical training regarding foundation work on the site and concretes.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Observe stages of carrying out excavation, foundation and concrete works and how to receive them.

CLO 2. Discover the work sequence at the site and the distribution of responsibilities (engineer / technician / manager / etc...)

CLO 3. Aware of the facility's industrial safety precautions.

CLO 4. Explain the technical specifications of the materials.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A3, A4, A8, A9, A10,	B3, B4, B5

4- *Mapping Course Los to NARS*

Field	Program (CBEs) that the course contribute in achieving	Learning Outcomes(LOs)
COMPETENCIES of ENGINEERING GRADUATE	**A3.** Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 1.** Identify the expected engineering problems and how to avoid them during the construction stages, especially during the foundation and concrete works **LO 3**. Apply engineering design processes to produce cost-effective solutions by identifying different building materials and methods of dealing with them, especially on-site foundation works and concrete, within the principles and contexts of sustainable design and development.
	A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO 2.** Develop students' ability to use objective engineering judgment to draw conclusions and apply them on site. **LO 4.** Discover contemporary technologies, codes of practice, standards and guidelines for quality in various work sites. **LO 5.** Learn about the industrial safety precautions of the facility., compliance with environmental issues, and risk management principles.

	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**LO 3**. Apply engineering design processes to produce cost-effective solutions by identifying different building materials and methods of dealing with them, especially on-site foundation works and concrete, within the principles and contexts of sustainable design and development . **LO 6.** Apply research techniques, whereby each student submits a set of reports, then detailed research at the end of the semester on what he has practiced during the training period.
	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO 2.** Develop students' ability to use objective engineering judgment to draw conclusions and apply them on site.
	A10. Acquire and apply new knowledge and practice self, lifelong, and other learning strategies.	**LO 6.** Apply research techniques, whereby each student submits a set of reports, then detailed research at the end of the semester on what he has practiced during the training period. LO 7. Acquire the ability to activate self-learning strategies through scientific research and suggested training sites
COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B3.** Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	LO 7. Acquire the ability to activate self-learning strategies through scientific research and suggested training sites
	B4. Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	**LO 8**. Create designs that meet the requirements of building users through the selection of appropriate materials and construction methods

	B5. Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO 9**. Identify the technical specifications of materials, structural design, construction, and technology to select appropriate materials and construction methods, thereby creating environmentally responsible designs that conserve the environment.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

This second training semester should be taken at a construction site approved by the department. Students are trained in construction stages, starting from site preparation, excavation, foundation works, concrete mix (material proportion & properties), water proofing, and retaining walls. Concrete skeleton, building envelope, walls and partitions will also be included. The training semester consists of 7 weeks with a total of 18 hours\week. Periodical progress reports have to be submitted, every two weeks, by the student to his training supervisor at the department, along with a final report. Follow-up site visits by training supervisors from the department should be scheduled, and their communication with site supervisors is an essential part of the evaluation process. Site supervisors will keep attendance log, and student's progress evaluation.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week (1-3)	• Demonstrate Security and safety at the site (using cranes - safe ways to store raw materials and tools - ...) and Identify the stages of concrete works and the sequence of their implementation. • Identify Excavation and foundation works and how to implement and receive them + submit a report at the end of the week to the supervisor	18	0	0	18	LO 1: LO9
Week (4)	Midterm Exam					
Week (5-7)	• Formwork for columns and ceiling (wooden - metal) and how to implement and receive them + submit a report at the end of the week to the supervisor.	18	0	0	18	LO 1: LO9
Week-8	Final Exam. Submission of the final report + discussion of the training with a committee of faculty members and the .supporting staff					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	---------
2nd	----------	---------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
CLO 1	✓	✓	✓	✓	✓	✓	✓		
CLO 2	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLO 3	✓			✓	✓	✓			
CLO 4	✓	✓	✓	✓		✓	✓	✓	✓

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)								
	General							ARE	
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Face-to-Face Lecture	✓	✓	✓	✓	✓	✓	✓	✓	✓
Online Education									
Tutorial/ Exercise	✓						✓	✓	✓
Group Discussion		✓			✓	✓		✓	✓
Laboratory									
Site Visit	✓	✓	✓	✓	✓		✓	✓	✓
Presentation							✓	✓	✓
Mini Project									
Research and Reporting	✓	✓	✓	✓	✓	✓	✓	✓	✓
Brain Storming									
Self-Learning	✓	✓	✓				✓	✓	✓

8- Assessments

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Written Exam									
Online Exam	✓	✓	✓	✓	✓			✓	✓
Oral Exam	✓	✓	✓	✓	✓			✓	✓
Quiz	✓	✓			✓			✓	✓
Lab Exam									
Take-Home Exam									
Research Assignment	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reporting Assignment	✓	✓	✓	✓	✓	✓	✓	✓	✓
Project Assignment									
In-Class Questions	✓	✓	✓	✓	✓			✓	✓

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Commitment to attendance	**10**	**Weekly**	—
Tutorial and report assessment (*Term Work*)-follow up-	**20**	**Weekly**	—
mid term	**20**	**Week 4**	—
Final Report	**20**	**Week 8**	—
End of term Oral exam- discussion-	**30**	**Week 8**	—
Total Mark	**100**	--	—

9- Facilities Required:

- ✓ All the capabilities of the site available during the training period, and the number and tools

10- List of References:

10.1. Course Notes:

- Observations during the training period from the supervisors on site and the teaching staff.

Course Directors	Name	Signature
Teaching staff	Teaching staff	
Course coordinator	Dr. Ghada Assal	
Program coordinator	**Prof. Osama Ahmed Ibrahim Masouad**	
Head of the Department	**Prof. Osama Ahmed Ibrahim Masouad**	
Date of approval	MAY-AUG (2022-2023)	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	
Course Specification	
FTR 231: Field Training (3)	

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Field Training (3)			**Course Code:**	FTR 231		
Program / level	Architectural Engineering			**SENIOR (1)**			
Term/ Academic year:	MAY-AUG (2022-2023)			**Credit Hours:**	3		
Contact Hours:	18	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	18
Pre-Requisite	FTR 162 +115 Units						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- Describe the information and identification of the basic good quality materials in building finishing works (ceilings - walls - floors - windows - doors -....)

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Determine the stages of finishing works in order and the steps for their implementation.

CLO 2. Observe how to receive each stage separately and ensure that it is implemented correctly.

CLO 3. Describe the technical specifications of the materials used in the finishing works of the building (ceilings - walls - floors - windows - doors- ....)

*3- **Relationship between the course and the Competencies :***

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A3, A4, A8, A9, A10,	B3, B4, B5

*4- **Mapping Course Los to NARS***

Field	Program (CBEs) that the course contributes in achieving	Learning Outcomes (LOs)
COMPETENCIES of ENGINEERING GRADUATE	**A3.** Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO 1.** Identify the expected engineering problems and how to avoid them during the construction phases
		LO 2. Develop students' ability to use objective engineering judgment to draw conclusions and apply them on site.
		LO 3. Apply engineering design processes to produce cost- effective solutions that meet specific needs by learning about different building materials and their handling methods and within the principles and contexts of sustainable design and development.
	A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO4.** Familiarize health and safety requirements, compliance with environmental issues, and risk managementprinciples.
	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**LO 5.** Apply research techniques, whereby each student submits a set of reports, then detailed research at the end of the semester on what he has practiced during the training period.
	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**LO 2.** Develop students' ability to use objective engineering judgment to draw conclusions and apply them on site.
	A10. Acquire and apply new knowledge; and practice self, lifelong and other learning	**LO 6.** Acquire the ability to activate self-learning strategies through scientific research and suggested

	strategies.	training sites.
COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B3.** Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 7**. Identify designs that meet the requirements of building users through the selection of finishing materials and methods.
	B4. Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	**LO 8**. Explain of finishing material and its technology and engineering problems associated with building designs.
	B5. Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO 9**. Identify the technical specifications of materials, structural design, construction, and technology to select appropriate materials and construction methods, thereby creating environmentally responsible designs that conserve the environment.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

Training in this semester will be also at a construction site and will include all the internal technical installations and finishes. The training semester consists of 7 weeks with a total of 18 hours\week. Periodical progress reports have to be submitted, every two weeks, by the student to his training supervisor at the department, along with a final report. Follow up site visits by the training supervisors should be scheduled to monitor training progress. Site supervisor's evaluation is essential part of the assessment process.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			LOs Covered by Course
			Lec.	Tut.	Lab.	
Week (1-3)	• Introducing the stages of implementation at the site • Determine the technical assets of brickwork and shellfish and how to receive it + submitting a weekend report to the supervisor + manual training if possible	18	0	0	18	LO 1: LO9

Week (4)	Midterm Exam					
Week (5-7)	• Determine the technical assets of the paint, floor tiles ar suspended ceilings how to obtain them + submita weekend report to the supervisor + manual training if possible.	18	0	0	18	LO 1: LO9
Week (8)	Final Exam. Submission of the final report + discussion of the training with a committee of faculty members and the supporting staff.					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	---------
2nd	----------	---------

6- Matrix of Course Objective and LOs

Course Learning Objectives	Learning Outcomes (LOs)								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
CLO 1	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLO 2	✓	✓	✓	✓	✓			✓	✓
CLO 3	✓	✓	✓	✓	✓	✓	✓		

7- Course Teaching and Learning Methods:

Teaching and Learning Methods	*Learning Outcome*(LOs)								
	General							ARE	
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Face-to-Face Lecture	✓	✓	✓	✓	✓	✓	✓	✓	✓
Online Education									
Tutorial/ Exercise	✓						✓	✓	✓
Group Discussion		✓			✓	✓			
Laboratory									
Site Visit	✓	✓	✓	✓	✓	✓		✓	
Presentation							✓	✓	✓
Mini Project									
Research and Reporting	✓						✓		✓
Brain Storming									
Self-Learning	✓	✓	✓				✓		✓

8- Assessment

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)								
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9
Written Exam									
Online Exam	✓	✓	✓	✓	✓			✓	✓
Oral Exam	✓	✓	✓	✓	✓			✓	✓
Quiz	✓	✓			✓			✓	✓
Lab Exam									
Take-Home Exam									
Research Assignment	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reporting Assignment	✓	✓	✓	✓	✓	✓	✓	✓	✓
Project Assignment									
In-Class Questions	✓	✓	✓	✓	✓			✓	✓

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Commitment to attendance	**10**	**Weekly**	—
Tutorial and report assessment (*Term Work*)-follow up-	**20**	**Weekly**	—
mid term	**20**	**Week 4**	—
Final Report	**20**	**Week 8**	—
End of term Oral exam- discussion-	**30**	**Week 8**	—
Total Mark	**100**	**--**	—

9- Facilities Required:

✓ All the capabilities of the site available during the training period, and the number and tools

10- List of References:

10.1. Course Notes:

- Observations during the training period from the supervisors on site and the teachingstaff

Course Directors	Name	Signature
Teaching staff	Teaching staff	
Course coordinator	Dr. Ghada Assal	
Program coordinator	**Prof. Osama Ahmed Ibrahim Masouad**	
Head of the Department	**Prof. Osama Ahmed Ibrahim Masouad**	
Date of approval	MAY-AUG (2022-2023)	

The Higher Technological Institute (HTI)	
Department: Department of Architectural Engineering	

Course Specification

FTR 261: Field Training (4)

Program(s) on which this course is given	Architectural Engineering
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering

A– Basic information

Course Title:	Field Training (4)			**Course Code:**		FTR 261	
Program / level	Architectural Engineering			**SENIOR (2)**			
Term/ Academic year:	MAY-AUG (2022-2023)			**Credit Hours:**		3	
Contact Hours:	18	**Lecture:**	0	**Tutorial:**	0	**Laboratories:**	18
Pre-Requisite	FTR 231+ 150 units						
Academic standards	(NARS 2018)						
Bylaw Approval	2016						

1- Course Aims:

- ✓ Learn about the skills of the technical office, site management, how to prepare the final executive drawings, booklet of conditions and specifications, as well as inventory work.

2- Course Learning Objectives (CLO):

At the end of this course, student should be able to :

CLO 1. Determine the skills required in the site management technical office.

CLO 2. Preparing the final executive drawings for the project.

CLO 3. Use the booklet of conditions and specifications.

3- Relationship between the course and the Competencies :

Field	National Academic Reference Standard (NARS)	
	COMPETENCIES of ENGINEERING	COMPETENCIES of ARE
Program Academic Standards that the course contributes in achieving	A3, A4, A8, A9, A10,	B3, B4, B5

4- Mapping Course Los to NARS

Field	*Program (CBEs) that the course contribute in achieving*	**Learning Outcomes (LOs)**
COMPETENCIES of ENGINEERING GRADUATE	**A3.** Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**LO1.** Identify the expected engineering problems and how to avoid them during the construction phases **LO 2.** Develop students' ability to use objective engineering judgment to draw conclusions and apply them on site. **LO 3.** Apply engineering design processes to produce cost-effective solutions that meet specific needs by learning about different building materials and their handling methods and within the principles and contexts of sustainable design and development.
	A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**LO4.** Discover contemporary technologies, rules of practice, standards and quality guidelines in various workshops. **LO5** Familiarize health and safety requirements, compliance with environmental issues, and risk management principles**.**
	A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**LO 6.** Apply research techniques, whereby each student submits a set of reports, then detailed research at the endof the semester on what he has practiced during the training period.
	A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	**LO 2.** Develop students' ability to use objective engineering judgment to draw conclusions and apply them on site.
	A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**LO 7**. Acquire the ability to activate self-learning strategies through scientific research and suggested training sites

COMPETENCIES of ARCHITECCTURAL ENGINEERING	**B3.** Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology, and engineering problems associated with building designs.	**LO 8**. Create designs that meet the requirements of building users through the selection of appropriate materials and constructionmethods
	B4. Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations, and procedures involved.	**LO 9**. Identify structural design, construction, technology, and engineering problems associated withbuilding designs.
	B5. Prepare design project briefs and documents and understand the context of the architect in the construction industry, including the architect's role in the processes of bidding, procurement of architectural services and building production.	**LO10**. Identify the technical specifications of materials, structural design, construction, and technology to select appropriate materials and construction methods, thereby creating environmentally responsible designs that conserve the environment.

5- Course Content:

5.1. Course Description (As indicated in program Bylaw):

The course will be reserved for Training in this semester will be at an architectural and consultancy firm and will include the technical office, site management, how to prepare the final executive drawings, booklet of conditions and specifications, as well as inventory work. The training semester consists of 7 weeks with a total of 18 hours\week. Periodical progress reports have to be submitted, every two weeks, by the student to his training supervisor at the department, along with a final report. Follow up site visits by the training supervisors should be scheduled to monitor training progress. Site supervisor's evaluation is essential part of the assessment process.

5.2. Course Topics/hours/Los Matrix

Week No.	*Topic*	*Total Hours*	*Contact hrs*			**LOs Covered by Course**
			Lec.	**Tut.**	**Lab.**	
Week (1-3)	• Identifying the stages of engineering projects contracts and the work of the technical office and defining the obligations of each party separately. • Determining the different types of tenders and defining the concept of engineering inventory and its types + submitting a weekend report to the supervisor	3	0	0	18	LO 1: LO10
Week (4)	MidtermExam					
eek (5-7)	• Calculating the quantities of construction work items (excavation + backfilling + regular concrete + reinforced concrete .. etc.) as well as creating materials specifications+ sending the weekend report to the supervisor + manual training if possible.	3	0	0	18	LO 1: LO10
Week (8)	Final Exam. Submission of the final report + discussion of the training with a committee of faculty members and the supporting staff.					

5.3. Experiment Topics:

Serial	Experiment	Laboratory hrs.
1st	----------	---------
2nd	----------	---------

6- *Matrix of Course Objective and LOs*

Course Learning Objectives	Learning Outcomes (LOs)									
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
CLO 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLO 2	✓		✓				✓	✓	✓	✓
CLO 3	✓	✓	✓	✓	✓	✓	✓			

7- *Course Teaching and Learning Methods:*

Teaching and Learning Methods	*Learning Outcome*(LOs)									
	General							ARE		
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
Face-to-Face Lecture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Online Education										
Tutorial/ Exercise	✓						✓	✓	✓	✓
Group Discussion		✓			✓	✓			✓	
Laboratory										
Site Visit	✓	✓	✓	✓	✓	✓		✓		✓
Presentation							✓	✓	✓	
Mini Project										
Research and Reporting	✓						✓		✓	
Brain Storming										
Self-Learning	✓	✓	✓				✓		✓	✓

8- *Assessment*

8.1. Course Assessment Methods:

Assessment Methods	*Learning Outcome*(LOs)										
	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10	LO 11
Written Exam											
Online Exam	✓	✓	✓	✓	✓	✓			✓	✓	✓
Oral Exam	✓	✓	✓	✓	✓	✓			✓	✓	✓
Quiz	✓	✓			✓	✓			✓		✓
Lab Exam											
Take-Home Exam											

Research Assignment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reporting Assignment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Project Assignment											
In-Class Questions	✓	✓	✓	✓	✓	✓				✓	✓

8.2. Assessment Schedule and Grades Distribution:

Assessment Method	Mark	Week	Exam Time
Commitment to attendance	**10**	**Weekly**	—
Tutorial and report assessment (*Term Work*)-follow up-	**20**	**Weekly**	—
mid term	**20**	**Week 4**	—
Final Report	**20**	**Week 8**	—
End of term Oral exam- discussion-	**30**	**Week 8**	—
Total Mark	**100**	**--**	—

9- Facilities Required:

✓ All the capabilities of the site available during the training period, and the number and tools

10- List of References:

10.1. Course Notes:

- Observations during the training period from the supervisors on site and the teachingstaff

Course Directors	Name	Signature
Teaching staff	**Teaching staff**	
Course coordinator	**Dr. Ghada Assal**	
Program coordinator	**Prof. Osama Ahmed Ibrahim Masouad**	
Head of the Department	**Prof. Osama Ahmed Ibrahim Masouad**	
Date of approval	**MAY-AUG (2022-2023)**	