

FUE - Future University in Egypt

Faculty of Engineering and Technology Department of Architectural Engineering

Course Specifications

ARC 411: Architectural Design (5)
"Environmental Design"

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programs:	(Not Applicable)
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Four – 7 th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Architectural Design (5)	Code: ARC 411
Credit Hours:	4Cr. Hrs.
Lectures:	2 Hrs.
Tutorial:	<u>6 Hrs.</u>
Total:	8 Hrs.
Prerequisite:	ARC 312: Architectural Design (4)

B- Professional Information

1- Catalog Course Description:

The course aims to give focus at “Environmental Design” principles. Students will experience how these principles guide and control the design process. The emphasis will be on the different manipulations of architectural and urban design that help to reduce energy consumption of both internal and urban spaces. The course projects may be such as: Research Center, Technical School, Museum, Echo Tourism, and other similar ones.

2- Overall aims of the course:

The main aims of this course are to:

- Enhance student's awareness of creative design process within a set of moderate "Environmental Design" concepts and principals.
- Train student to apply architectural strategies for enhancing the environmental performance of internal and external spaces.

3. Intended learning outcomes (ILOs):

3.1. Program ILOs related to course:

A03 Demonstrate knowledge and understanding of the principles and theories of architectural design and planning, as process and product.

A07 Demonstrate knowledge and understanding of the principles of sustainable design and climatic considerations in addition to the different elements of the natural environment, different energy types, appropriate environmental control techniques and different technical installations in buildings.

A09 Demonstrate understanding and appreciation to the social, environmental, ethical and economic considerations and human factors affecting the exercise of the architectural decisions

B02 Compare, analyze and criticize different engineering problems and case studies, evaluate design alternatives and conclude results based on analytical thinking

B03 Solve architectural problems often on the basis of limited and possibly contradicting information

B04 Explore and think of design forms in two and three dimensions engaging images of places and time with innovation and creativity

B11 Integrate relationship of structure, building materials, and construction elements into design process.

C01 Ability to integrate knowledge and understanding of mathematics, science, art, information technology, design and engineering concepts to design and plan buildings and to solve problems

C03 Use different expression techniques to visualize ideas verbally and graphically, either manually or digitally

C15 Display imagination and creativity.

D02 Discuss and defend ideas

D05 Manage tasks and resources

D08 Search for information and adopt life-long self-learning

3.2. Intended learning outcomes of course (ILOs):

a- Knowledge and understanding:

By the end of this course the student should be able to:

- a.1. Identify principles of design of multi-functional architectural projects in accordance with relevant technical disciplines.
- a.2. Outline principles of preparation and presentation of complex design projects in a variety of contexts and scales.
- a.3. Identify different architectural functions and circulation patterns.
- a.4. Identify appropriate forms and structure systems for different architectural functions.
- a.5. Identify different site boundaries and all environmental contexts (natural, man-made and human)

b- Intellectual skills:

By the end of this course the student should be able to:

- b.1. Integrate relationships of structure systems, construction elements and building materials into design process
- b.2. Breakdown multipurpose complex design projects into manageable inter-relatable partial components
- b.3. Compare different design objectives and sort them in terms of priorities in the design process.
- b.4. Analyze circulation patterns in accordance with architectural projects' elements.
- b.5. Analyze site and environmental contexts and features.
- b.6. Relate three-dimensional design with images of real sites and places

c- Professional and practical skills:

By the end of this course the student should be able to:

- c.1. Compose architectural design programs for multifunctional projects
- c.2. Convert complex projects' programs into appropriate architectural forms using proper structure systems.
- c.3. Apply site analysis findings to proper design with respect of all environmental contexts (natural, man-made and human) in a positive contribution to them
- c.4. Produce and present architectural design projects using an appropriate range of media and design-based software.
- c.5. Review and criticize similar and existing projects.

d- General and transferable skills:

By the end of this course the student should should be able to:

- d1. Develop team work co-operative skills
- d2. Communicate effectively
- d3. Manage tasks and resources within constrained time

3- Course ILOs versus Program ILOs relation

See table [1]

4- ILOs Teaching & Assessment Method

See Appendix (1)

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Research work for the related topic. Introduction to project and site analysis and detailed program.	8	4	12
2	Alternative of layout, Solid vs. Void	6	13	19
3	Layout and Study Model	4	8	12
4	Master Plan	2	8	10
5	Master Plan (Design Development)	0	13	13
6	Typical Floor Plans	4	10	14
7	Elevations & Sections	2	13	15
8	Sketch design	1	4	5
9	Perspective and interiors	1	7	8
10	Design Finishing	2	4	6
11	Final Submission of the Project	0	6	6
Total Hours		30	90	120

For the relation between the course contents and "Intended Learning Outcomes" (ILOs) see Appendix, table [2]

6- learning/teaching methods:

See Appendix, table [3]

7- ILOs Teaching & Assessment Method

See Appendix, table [4]

8- Weighting of assessments

- Final exam:.....40%
- Final project:.....15%
- Year's work:
 - Assignments(research +sketch designs).....35%
 - Participation.....10%

9- List of references:

1- Text Book:

Environmental Design; An introduction for architects and engineers – 3rd edition – by Randall Thomas.

2- Recommended Readings:

(Data Books - Books of Architectural Theories - Selected references for famous buildings and Architects, Periodicals, Web sites, etc)

- Time Saver Standards for Building Types, McGraw-Hill, USA. Chiara, J., Callender , J. (1983).
- Nefeurt, E.& P., (1990), Architect's Data, Blackwell Science, USA.
- Fawcett, A. Peter, (2003), Architecture: Design Notebook, Architectural Press, USA
- Adler, D., (1999), Metric Handbook: Planning and Design Data, Architectural Press, UK
- Pickard, Q., (2005), The Architect's Handbook, Blackwell Publishing, UK

10- Facilities required for teaching and learning:

- Design Studios
- Presentation Board
- Architectural Library
- Computer and Data Show Projector
- Internet Connection

Course coordinator: Prof. Dr. Samir Sadek Hosny

Head of Department: Prof. Dr. Samir Sadek Hosny

Date: November 2017

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs												
		A03	A07	A09	B02	B03	B04	B11	C01	C03	C15	D02	D05	D08
Course ILOs	a1.	•												
	a2.	•												
	a3.	•	•											
	a4.		•											
	a5.			•										
	b1.				•	•								
	b2.					•								
	b3.													
	b4.						•							
	b5.				•									
	b6.						•	•						
	c1.								•					
	c2.										•			
	c3.									•				
	c4.										•			
	c5.										•			
	d1.											•		
	d2.												•	
d3.													•	

Table [2]: Course Content/ILO Matrix

Course Content	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	b6	c1	c2	c3	c4	c5	d1	d2	d3
Research work for the related topic. Introduction to project and site analysis and detailed program.		•	•	•	•		•	•	•	•	•	•	•	•		•	•	•	•
Alternative of layout, Solid vs. Void		•	•			•	•	•	•	•	•	•	•	•	•	•			•
Layout and Study Model	•	•	•	•		•			•		•			•					
Master Plan		•	•	•		•				•	•			•					
Master Plan (Design Development)	•	•	•	•		•								•	•				•
Typical Floor Plans		•	•	•		•					•			•	•				•
Elevations & Sections		•	•	•			•	•	•	•		•		•					
Sketch design		•	•	•	•		•	•	•	•	•	•	•	•	•				•
Perspective and interiors		•	•				•		•	•									
Design Finishing		•	•	•	•	•							•		•				•
Final Submission of the Project	•	•	•	•	•		•	•	•	•	•			•	•				•

Table [3]: Teaching Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	b6	c1	c2	c3	c4	c5	d1	d2	d3
Studio Design (Practical)	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Research	●	●	●	●	●			●	●	●	●	●				●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	b6	c1	c2	c3	c4	c5	d1	d2	d3
Final examination	●	●	●	●	●	●	●	●	●	●	●		●	●	●				●
Final Submission of the Project	●	●	●	●	●	●			●		●				●				●
Assignments (Research + Sketch Design)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●