Future University in Egypt

Faculty of Engineering and Technology

Architectural Engineering Department

B. SC. In Architectural Engineering

Program & Courses Specifications

Part 1 - Departmental Requirements

2017 / 2018

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Program Specifications of

B.Sc. in Architectural Engineering 2017/2018

University: Future University in Egypt Faculty: Engineering & Technology

A- Basic Information

1. **Program title :** B. SC. in Architectural Engineering
2. **Program type:** Single ■ Double ☐ Multiple ☐
3. **Faculty:** Engineering & Technology
4. **Department offering the program:** Architectural Engineering
5. **Coordinator :** Assistant Prof. Dr. Tamer Samir
6. **External evaluator(s) :** Prof. Dr. Morad Abdel Kader
7. **Internal evaluator(s) :** Prof. Dr. Samir Sadek & Associate Prof. Dr. Sahar Morsi
8. **Date of program bylaw approval:** 2006
9. **Date of program specifications approval:** November 2017

B- Professional Information

1 The Program aims

The main aims of the "Architectural Engineering" program at the "Faculty of Engineering and Technology" in "Future University in Egypt" are:

PA - 1. To equip graduates with the proper and fair scientific knowledge of:

1.1. Basic sciences that may be used for finding solutions of engineering problems.
1.2. Engineering sciences that are essential to develop robust architectural designs.
1.3. Different theories of architectural design as process and product.
1.4. The ancestors' architecture and its relation with their contemporary communities.
1.5. Contemporary engineering issues that are raised in local and international community.
1.6. Cultural diversity and its mutual impact on buildings' character and identity.

PA - 2. To train graduates to be able to:

2.1. Apply investigative skills, statistical and logical analysis methods to define problems.
2.2. Apply critical and creative thinking methods to create concepts.
2.3. Design robust systems and architectural projects based on certain needs and realistic constraints.

2.4. Design and conduct environmental and social experiments.
2.5. Use the engineering tools and software, necessary for engineering practice and project management.
2.6. Work effectively within multi-disciplinary teams.
2.7. Communicate effectively.

PA - 3. To have graduates embrace positive thoughts and beliefs regarding:

3.1. The impact's importance of engineering solutions on society & environment.
3.2. Their professional and ethical responsibilities towards their society.
3.3. The value of self- and life- long learning.
3.4. The importance of applying a holistic problem solving approach for complex, ambiguous, and open-ended challenges and scenarios.
3.5. The importance of addressing urban issues, planning, and community needs through design work.
3.6. The new role of the architectural engineer as a guardian of environment and its sustainability.

To achieve these aims, the program is designed to target the following Intended Learning Outcomes (ILOs).

2 Program Intended learning outcomes (ILOs)

A. Knowledge and understanding:

By the end of this program the graduate should be able to demonstrate knowledge and understanding of:

A01 Concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A02 The basics of information and communication technology (ICT)

A03 The principles and theories of architectural design and planning, as process and product

A04 History of architecture, urban, and regional planning across different eras.

A05 Some topics, selected from different humanity disciplines, to enhance his/her breadth knowledge.

A06 Different building construction systems and execution design methods and techniques

A07 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

A08 Architectural physical and computer modeling, simulation, rendering and presentation techniques

A09 The social, environmental, ethical and economic considerations and human factors affecting the exercise of the architectural decisions

A10 Design problems, listing clients' needs & requirements and gathering relevant information

A11 Building regulations and legislations in practicing architecture as well as administration and management principles relevant to engineering in general and architecture in particular.

A12 Characteristics of engineering materials related to the discipline.

A13 Site jargon, technical language and report writing styles and rules.

A14 Contemporary engineering topics.

A15 The processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.

A16 The significance of urban spaces and the interaction between human behavior, built environment and natural environment.

A17 The role of the architecture profession relative to the construction industry and the overlapping interests of organizations representing the built environment.

A18 Various dimensions of housing problem and the range of approaches, policies, and practices that could be carried out to solve this problem.

B. Intellectual skills

By the end of this program the graduate should be able to:

B01 Use basic mathematics and physics knowledge to solve physical and engineering problems

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.

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions.

B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.

B07 Incorporate different dimensions of economy, society, environment, technology applicability, safety, site constraints, urban context and risk management in design .

B08 Analyze results of numerical models and assess their limitations.

B09 Create systematic and methodic approaches when dealing with new and advancing technology .

B10 Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.

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

B12 Integrate community design parameters into design projects .

B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.

B14 Discuss, and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession & practice.

B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.

C. Professional and practical skills

By the end of this program the graduate should be able to:

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

C02 Apply numerical modeling methods to engineering problems.

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

C04 Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.

C05 Prepare and present technical reports, working drawings, and construction documents for design projects

C06 Use appropriate computer programs in engineering and architectural works

C07 Build architectural physical and computer models

C08 Use special field devices.

C09 Demonstrate project construction administration and management skills.

C10 Apply safe systems at work and observe the appropriate steps to manage risks.

C11 Apply quality assurance procedures and follow codes and standards.

C12 Exchange knowledge and skills with engineering community and industry.

C13 Use appropriate construction techniques and materials to specify and implement different designs.

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.

C15 Display imagination and creativity.

C16 Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.

C17 Provide leadership and education to the client particularly with reference to sustainable design principles.

C18 Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.

C19 Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.

D. General and transferable skills

By the end of this program the graduate should be able to:

D01 Communicate effectively.

D02 Discuss and defend ideas.

D03 Demonstrate efficient IT capabilities

D04 Deal with others according to the rules of the professional ethics

D05 Manage tasks and resources

D06 Lead and motivate individuals.

D07 Work coherently as a part of a multidisciplinary team.

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

D09 Work under stressful environments and within constraints of time and budget

D10 Acquire entrepreneurial skills.

D11 Refer to relevant literatures.

3 Academic standards

The department council approved in its official meeting on the **3rd of July 2016** to develop the "Architectural Engineering" program Intended Learning Outcomes (ILO's) in light of the National Academic Reference Standards (NARS) for Bachelor degree of engineering published by the National Authority for Quality Assurance and Accreditation of Education (NAQAAE -August 2009) as the main academic standards reference.

- See Table [1] for a relationship matrix of **"Program ILOs Vs the NARS**'s **ILOs**".
- See Table [2] for a relationship matrix of **"Program aims Vs NARS's Student's Attributes"**.
- See Table [3] for a relationship matrix of **"Program Aims Vs Institute's Mission**".
- See Table [4] for a relationship matrix of **"Program Aims Vs Program ILOs**".
- See Table [5] for a relationship matrix of **Program ILOs Vs the Program Courses**.

4 Benchmark

The department council approved in its official meeting on the **3rd of July 2016** the adoption of the accreditation standards of the Accreditation Board for Engineering and Technology (ABET) as a benchmark.

5 Curriculum Structure and Contents

5.1 Programme duration:

Five Years, 10 semesters, 175 Cr.H. - 269 contact hours

5.2 Programme structure

Contact Hours Distribution (269h)		
Type	Hrs	%
Lectures	128h	48%
Tutorial/lab	141h	52%

Mandatory courses (175 Cr. H.)		
Type	Cr. H.	%
Compulsory	157	90%
Elective	18	10%
Optional/Selective	49	

Courses Classification		%	NARS Criteria %
Humanities and Social Sciences	21	12	9-12 %
Mathematics and Basic Sciences	21	12	20-26 %
Basic Engineering Sciences	40	22.9	20-23 %
Applied Engineering and Design	52	29.7	20-22 %
Computer Applications and ICT	16	9.1	9-11 %
Design Projects and Practice	25	14.3	8-10 %
Total	175 Cr.H.		

5.3 Program Courses

5.3.1 UNIVERSITY REQUIREMENTS (12 credit hours)

Compulsory Courses List (8 credit hours)		
Code	**Course Title**	**Cr. H**
CMP 101	Introduction to Computers	2
HUM 103	Human Rights	2
ENG 101	English Language 1	2
ENG 102	English Language 2	2

Elective Courses List (4 credit hours)		
Code	**Course Title**	**Cr. H**
BSA H01	Administration of Small Projects	2
HUM H03	Environmental Science	2
HUM H05	History of Science	2
HUM H06	Psychology	2
HUM H07	Sociology	2
HUM H08	Scientific Thinking	2
HUM H09	Specific Computer Applications	2

5.3.2 FACULTY REQUIREMENTS (32 credit hours)

Compulsory Courses List (30 credit hours)		
Code	**Course Title**	**Cr.H**
CHM 151	Chemistry 1	2
GEN 313	Report Writing & Presentation Skills	2
CMP 132	Computer Programming	2
GRA 141	Graphics 1	2
GRA 142	Graphics 2	2
MAN 121	Production Technology	2
MEC 121	Mechanics 1	2
MEC 122	Mechanics 2	2
MTH 111	Mathematics 1	3
MTH 112	Mathematics 2	3
PHY 131	Physics 1	4
PHY 132	Physics 2	4

Elective Courses List (2 credit hours)		
Code	**Course Title**	**Cr.H**
GEN 441	Law for Professional Engineers	2
ARC 582	Professional Practice & Legislations	2

5.3.3 DEPARTMENT REQUIREMENTS (131 credit hours)

Compulsory Courses List (119 credit hours)		
Code	**Course Title**	**Cr.H**
ARC 211	Architectural Design 1	3
ARC 212	Architectural Design 2	3
ARC 221	History & Theories of Architecture 1	2
ARC 222	History & Theories of Architecture 2	2
ARC 231	Graphics & Visual Skills 1	3
ARC 232	Graphics & Visual Skills 2	3
ARC 241	Building Construction & Materials 1	3
ARC 242	Building Construction & Materials 2	3
ARC 311	Architectural Design 3	4
ARC 312	Architectural Design 4	4
ARC 321	History & Theories of Architecture 3	2
ARC 322	History & Theories of Architecture 4	2
ARC 323	Human Studies in Architecture	2
ARC 341	Building Construction & Materials 3	4
ARC 342	Building Construction & Materials 4	4
ARC 361	Environmental Control & Technical Installations 1	2
ARC 362	Environmental Control & Technical Installations 2	2
ARC 411	Architectural Design 5	4
ARC 412	Architectural Design 6	4
ARC 421	History & Theories of Architecture 5	3
ARC 422	History & Theories of Architecture 6	3
ARC 451	Urban Planning 1	3
ARC 452	Urban Design & Housing 1	3
ARC 453	Landscape Architecture	3
ARC 471	Execution Designs 1	4
ARC 472	Execution Designs 2	4
ARC 511	Architectural Design 7	4
ARC 551	Urban Planning 2	3
ARC 552	Urban Design & Housing 2	3
ARC 571	Execution Designs 3	4
ARC 581	Project Management & Feasibility Studies	2
ARC 501	Graduation Project Studies	2
ARC 502	Graduation Project	5
MTH 213	Mathematics, Statistics & Computers	3
SCM 214	Theory of Structures	3
SCM 215	Properties & Strength of Materials	2
SCM 223	Surveying	2
SCM 317	Reinforced Concrete for Architects	2
SCM 418	Steel Structures for Architects	2
SCM 442	Foundations for Architects	3

Elective Courses List (12 credit hours)		
Code	**Course Title**	**Cr.H**
ARC E01	Computer Applications For Architects 1	3
ARC E02	Computer Applications For Architects 2	3
ARC E03	Interior Design	3
ARC E04	Community Development / participatory Design	3
ARC E05	Architectural Heritage: Conservation - Preservation	3
ARC E06	Urban Upgrading and Management	3
ARC E07	Architectural Aesthetics & criticism	3
ARC E08	Appropriate Architecture & Technologies	3
ARC E09	Innovative | Architecture & Technologies	3
ARC E10	Computer Applications For Architects 3	3
ARC E11	Computer-Aided Information (GIS)	3

5.4 Suggested Schedule

First Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	MTH 111	Differentiation with Applications and Algebra(Math. 1)	3	2	5	3	-
2	MEC 121	Mechanics 1	2	2	4	2	-
3	PHY 131	Physics 1	3	3	6	4	-
4	GRA 141	Graphics 1	1	3	4	2	-
5	CHM 151	Chemistry 1	2	2	4	2	-
6	CMP 101	Introduction to Computers	2	1	3	2	-
7	ENG 101	English Language 1	2	0	2	2	-
Total			**15**	**13**	**28**	**17**	

Second Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	MTH 112	Integration with Applications and Analytical Geometry(Math. 2)	3	2	5	3	MTH 111
2	MEC 122	Mechanics 2	2	2	4	2	MEC 121
3	PHY 132	Physics 2	3	3	6	4	-
4	GRA 142	Graphics 2	1	3	4	2	GRA 141
5	CMP 132	Computer Programming	2	2	4	2	CMP 101
6	MAN 121	Production Technology	2	2	4	2	-
7	ENG 102	English Language 2	2	0	2	2	ENG 101
Total			**15**	**14**	**29**	**17**	

Third Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	MTH 213	Mathematics, Statistics & Computers	2	2	4	3	-
2	ARC 211	Architectural Design 1	2	4	6	3	GRA 141 or 142
3	ARC 221	History & Theories of Architecture 1	2	0	2	2	-
4	ARC 231	Graphics & Visual Skills 1	2	2	4	3	-
5	ARC 241	Building Construction & Materials 1	2	2	4	3	GRA 141 or 142
6	SCM 214	Theory of Structures	2	2	4	3	MEC 121
Total			**12**	**12**	**24**	**17**	

Fourth Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	ARC 212	Architectural Design 2	2	4	6	3	ARC 211
2	ARC 222	History & Theories of Architecture 2	2	0	2	2	-
3	ARC 232	Graphics & Visual Skills 2	2	2	4	3	ARC 231
4	ARC 242	Building Construction & Materials 2	2	2	4	3	ARC 241
5	SCM 215	Properties & Strength of Materials	2	2	4	2	-
6	SCM 223	Surveying	2	2	4	2	-
7	HUM 103	Human Rights	2	0	2	2	-
Total			**14**	**12**	**26**	**17**	

Fifth Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	ARC 311	Architectural Design 3	2	6	8	4	ARC 212
2	ARC 321	History & Theories of Architecture 3	2	0	2	2	ARC 221
3	ARC 323	Human Studies in Architecture	2	0	2	2	-
4	ARC 341	Building Construction & Materials 3	2	4	6	4	ARC 242
5	ARC E01	Departmental Elective 1	2	2	4	3	-
6	ARC 361	Environmental Control & Technical Installations 1	2	1	3	2	-
7	GEN 313	Report Writing and Presentation Skills	2	1	3	2	-
Total			**14**	**14**	**28**	**19**	

Sixth Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	ARC 312	Architectural Design 4	2	6	8	4	ARC 311
2	ARC 322	History & Theories of Architecture 4	2	0	2	2	ARC 222
3	ARC 342	Building Construction & Materials 4	2	4	6	4	ARC 341
4	ARC E02	Departmental Elective 2	2	2	4	3	-
5	ARC 362	Environmental Control & Technical Installations 2	2	1	3	2	-
6	SCM 317	Reinforced Concrete for Architects	2	2	4	2	SCM 214
7	UNV E01	University Elective 1	2	0	2	2	-
Total			**14**	**15**	**29**	**19**	

Seventh Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	ARC 411	Architectural Design 5	2	6	8	4	ARC 312
2	ARC 421	History & Theories of Architecture 5	3	0	3	3	-
3	ARC 451	Urban Planning 1	2	2	4	3	-
4	ARC 471	Execution Designs 1	2	4	6	4	ARC 342
5	UNV E02	University Elective 2	2	0	2	2	-
6	SCM 442	Foundations for Architects	2	2	4	3	-
Total			**13**	**14**	**27**	**19**	

Eighth Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	ARC 412	Architectural Design 6	2	6	8	4	ARC 411
2	ARC 422	History & Theories of Architecture 6	3	0	3	3	ARC 421
3	ARC 452	Urban Design & Housing 1	2	2	4	3	-
4	ARC 472	Execution Designs 2	2	4	6	4	ARC 471
5	ARC 453	Landscape Architecture	2	2	4	3	-
6	SCM 418	Steel Structures for Architects	2	2	4	2	SCM 214
Total			**13**	**16**	**29**	**19**	

Ninth Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	ARC 511	Architectural Design 7	2	6	8	4	ARC 412
2	ARC 551	Urban Planning 2	2	2	4	3	ARC 451
3	ARC 552	Urban Design & Housing 2	2	2	4	3	ARC 452
4	ARC 571	Execution Designs 3	2	4	6	4	ARC 472
5	ARC E03	Departmental Elective 3	2	2	4	3	-
6	ARC 501	Graduation Project Studies	2	1	3	2	ARC 412
Total			**12**	**17**	**29**	**19**	

Tenth Semester							
No	Course		Weekly Hours				Prerequisite Courses
	Code	Title	Lec	Ex/ Lab	Total	CrH	
1	ARC E04	Departmental Elective 4	2	2	4	3	-
2	ARC 581	Project Management & Feasibility Studies	2	1	3	2	As Advised
3	ARC 582	Professional Practice & Legislations	2	1	3	2	As Advised
4	ARC 502	Graduation Project	0	10	10	5	ARC 501
Total			**6**	**14**	**20**	**12**	

6 Program admission requirements

Having Egyptian Secondary education or equivalent certificate with major in Mathematics.

7 Regulations for Registration, Progression and Program Completion

7.1 Registration Procedure

Before the start of each semester, students should register the courses which they select, in certain templates specially designed for this propose, at the date specified by the faculty before the semester starts. The ordinary load for the semester ranges between 12 to 19 credit hours, the maximum load of the summer course is 9 credit hours. Excellent students are allowed to register up to 21 credit hours, subject to the approval of the academic advisor and the faculty Dean.

7.2 Course Withdrawal and Addition

After the primary registration, students are allowed to drop and add courses, during the first two weeks of the semester after the advice of the academic advisor and the approval of the faculty Dean. It is not possible to add any course to the student's time table after the end of the registration period. The student may withdraw from a course or more during the first 10 weeks provided that the number of remaining registered hours is not less than the minimum requirements of the semester. It is not allowed for a student to withdraw from a course after the allowed period (the first ten weeks of the semester) without an excuse acceptable to the faculty council. However, if the faculty council accepts the excuse, the student is then allowed to register once more in this course, and keeps his course grade.

7.3 Attendance and Absence

Attendance of lectures, tutorials and labs is considered to be an important issue in the educational process inside the program, as the student gets benefits from the interaction inside the class room between him and the staff members, teaching assistants and colleagues. Therefore, students should attend regularly so that their grades are not affected by their absences.

Students that do not attend a term exam without an excuse that his/her academic advisor and the course's instructor agree upon are not given a make-up examination. Students may be forced to withdraw from a course if the absence ratio exceeds 25% of the lectures and tutorials during the first 10 weeks of the semester, but if the absence ratio exceeds 25% after the first 10 weeks, students are not allowed to withdraw the course, attending lectures or attending the final term examination. The student gets grade (F) in this course. The students have to be warned at least once before preventing them from attending the examination.

The Final exam may be postponed for a student till the start of the next semester if he/she has an excuse accepted by the faculty council. In this case, the semester work mark is kept, and the student is allowed to enter the final exam at the beginning of the next semester, and gets a final grade (Incomplete) in this course in the semester in which he/she did not take the examination. This incomplete grade is changed to the actual grade obtained by the student in the postponed examination.

7.4 Semester Withdrawal

The student has the right to withdraw from an academic semester within the withdrawal period announced in the academic calendar of the semester. He/She will be considered to have failed if he withdraws after the aforementioned period, unless he has a valid reason which is acceptable to his/her advisor, and the faculty Dean.

7.5 System of Examinations

The final mark of a given course is composed of the sum of semester year work and the final examination mark. The total grade distribution of each type is as follows:

Final Exam	40%
Semester work (Assignments, Midterm Exams, Sketch designs, Design projects, Quizzes, …etc. The course instructor may suggest the suitable distribution for these marks	60%

Students are to be informed about their grades two times: 25% by the 6th week and 50% by the 11th week.

7.6 Grading System

At the end of the semester students receive a final grade in each course. The grade is the professor's official estimate of the student achievement as reflected in examinations, assignments and class participation. The final grades are recorded on the student permanent record at the Office of the University Registrar. The adjacent table illustrates the used grading system.

Grade	Range	Points
A	From 90% to 100%	4.0
A-	From 85 to < 90%	3.7
B+	From 80 to <85%	3.3
B	From 75 to < 80%	3.0
B-	From 70 to < 75%	2.7
C+	From 65 to < 70%	2.3
C	From 60 to < 65%	2.0
C-	From 55 to <60%	1.7
D+	From 53 to < 55%	1.3
D	From 50 to < 53%	1.0
F	Less than 50 %	0.0

The grade point average (G.P.A) is calculated as follows: G.P.A = (Sum of: the multiplication of the credit hours of each course by the points earned for that course) / (Total number of credit hours completed)

7.7 Repetition of courses in the case of failure

If a student fails a compulsory course in any semester, he/she should restudy this course. However, if he fails an elective course, he may restudy the same course or register in another

elective course with the approval of the academic advisor. If the student succeeds a repeated course, the (F) grade remains in his academic record, but its mark is replaced by the new mark which is then used in calculating his G.P.A.

7.8 Repetition of courses for improving the G.P.A

A student is allowed to register one course or more in order to improve his G.P.A. In this case the student gets his new mark whatever its value and the old mark is removed with its credit hours from his academic record. In case a student wants to re-register a course for the second time, he/she has to take the permission of his advisor and the approval of the college council.

7.9 Registration for a student with low G.P.A.

If the G.P.A of a student in any semester drops below 2.0, he is put on probation (under close observation) for the next two semesters and is not allowed to register more than 12 credit hours in these semesters.

7.10 Degree Requirements

To be awarded the Bachelor of Science Degree in Architecture Engineering, students must earn 175 credit hours. The student must earn a grade of D or better in all the required courses and earn a grade-point average (GPA) of (C) or better in order to graduate. To get the rank of honor the student should have not failed any course during his study.

G.P.A	RATING	Rank of Honor *
3.7- 4.0	Distinction	First Rank
3.3 - Less than 3.7	Very Good	Second Rank
2.3 - Less than 3.3	Good	-
2.0 - Less than 2.3	Pass	-

7.11 Practical Training

After the second year of study, each student is required to spend a minimum of four weeks in practical training every year during the summer vacation. This training can be carried out in Egypt or abroad. A complete account of the experience is reported, presented and evaluated as unaccredited activity but mandatory.

8 Program ILOs Assessment Methods

The following table illustrates the assessment methods and what they assess in most cases. For further details refer to the courses specifications.

	Program ILOs			
	K&U	Intellectual	Professional	General
Written Exams	■	■	■	
Practical Exams	■		■	■
Oral Exams	■	■		■
Projects	■	■	■	■
Researches	■		■	■

9 Evaluation of program intended learning outcomes

Evaluator	Tool	Sample
1- Senior students	Evaluation sheet	50%
2- Alumni	Evaluation sheet & interview	10%
3- Stakeholders (Employers)	Evaluation sheet & interview	5 different sectors
4-External and internal Evaluators	Evaluation report	1 for each
5- Other: Faculty Members	Evaluation sheet	100%

Table [1] matrix of **"Program ILOs Vs the NARS"**.

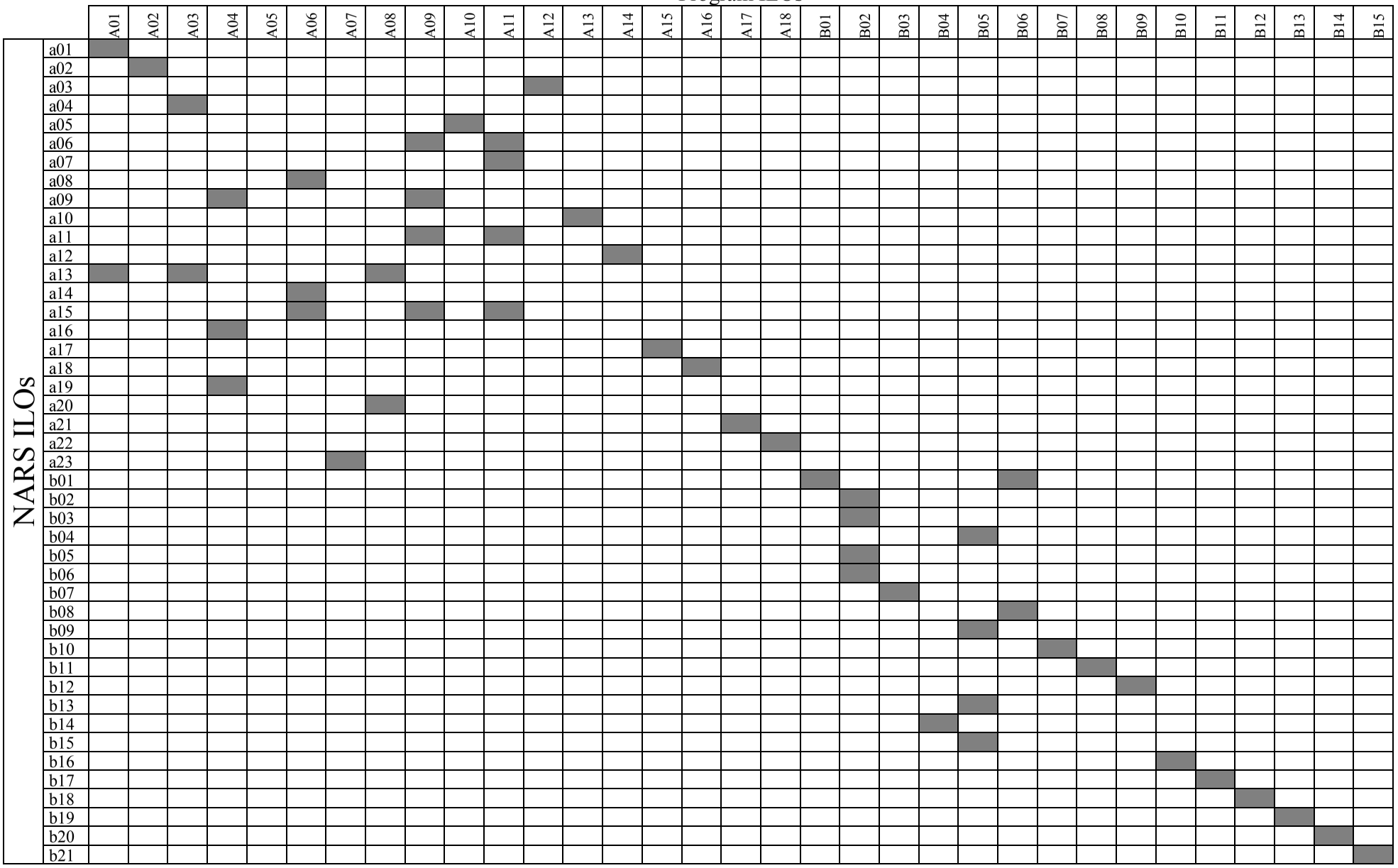

Table [1] matrix of **"Program ILOs Vs the NARS"**. Cont.

NARS ILOs	Program ILOs																														
	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11
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c17																■														
c18																	■													
c19																		■												
c20																			■											
c21																				■										
c22																					■									
d01																										■				
d02																												■		
d03																				■	■									
d04																						■								
d05																									■					
d06																								■						
d07																											■			
d08																													■	
d09																														■

Table [2] matrix of **"Program Aims Vs the NARS Graduate's Attributes".**

NARS Graduate's Attributes	Program aims: PA1						PA2							PA3					
	1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.3	3.4	3.5	3.6
a) Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.	■	■																	
b) Design a system; component and process to meet the required needs within realistic constraints.									■										
c) Design and conduct experiments as well as analyze and interpret data.										■									
d) Identify, formulate and solve fundamental engineering problems.	■							■											
e) Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.								■			■								
f) Work effectively within multi-disciplinary teams.												■							
g) Communicate effectively.													■						
h) Consider the impacts of engineering solutions on society & environment.										■				■					
i) Demonstrate knowledge of contemporary engineering issues.					■														
j) Display professional and ethical responsibilities; and contextual understanding															■				
k) Engage in self- and life- long learning.																■			
l) Design robust architectural projects with creativity and technical mastery.		■	■						■										
m) Demonstrate investigative skills, attention to details, and visualize/ conceptualize skills.							■												
n) Adopt a holistic problem solving approach for complex, ambiguous, and open-ended challenges and scenarios.																	■		
o) Demonstrate knowledge of cultural diversity, differences and the impact of a building on community character and identity.				■		■													
p) Address urban issues, planning, and community needs through design work.																		■	
q) Recognize the new role of architectural engineer as the leader of design projects— who has the ability to understand, assemble, and coordinate all of the disciplines— to create a sustainable environment.																			■

Table [3] matrix of **"Program Aims Vs the Institute's Mission".**

		Program aims																			
		PA1						PA2							PA3						
		1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.3	3.4	3.5	3.6
Institute's Mission: The Faculty of Engineering and Technology, Future University provides a promising academic environment:	* Enabling the preparation of eminence engineers	■	■	■	■	■	■	■	■	■	■	■	■	■			■	■		
	* Capable to compete locally and regionally,			■	■	■	■					■		■	■		■			■
	* And can convoy professionally and ethically												■	■		■				■
	* With the labor requirements.							■	■			■	■					■		
	* This academic environment stimulates conducting innovative scientific research							■	■								■	■		
	* For community development.										■		■	■	■	■			■	■

Table [4] matrix of **"Program Aims Vs Program ILOs".**

	Program ILOs	Program aims: PA1						PA2							PA3					
		1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.3	3.4	3.5	3.6
"Knowledge & Understanding" and "Intellectual" Skills	a01	■	■																	
	a02		■																	
	a03			■																
	a04				■															
	a05					■														
	a06		■	■						■										
	a07		■	■		■				■	■				■					■
	a08		■						■	■		■								
	a09			■	■	■	■				■				■	■			■	■
	a10			■			■	■	■	■			■	■		■				
	a11		■			■			■	■						■				
	a12		■			■				■					■					
	a13		■				■					■	■	■						
	a14					■													■	■
	a15			■		■	■				■					■		■	■	■
	a16			■		■	■			■					■	■			■	■
	a17					■				■										
	a18		■	■		■	■			■					■	■			■	
	b01	■								■										
	b02	■						■	■											
	b03									■										
	b04									■										
	b05									■										
	b06											■								
	b07																			
	b08							■	■											
	b09							■	■											
	b10							■												
	b11								■											
	b12										■									
	b13										■									
	b14										■									
	b15							■	■		■									

Table [4] matrix of **"Program Aims Vs Program ILOs".** Cont.

	Program ILOs	Program aims: PA1						PA2							PA3					
		1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.3	3.4	3.5	3.6
"Practical & Professional" Skills and "General & Transferable Skills"	c01									■										
	c02											■								
	c03													■						
	c04											■								
	c05													■						
	c06											■								
	c07													■						
	c08											■								
	c09												■							
	c10									■										
	c11									■										
	c12													■						
	c13									■										
	c14									■										
	c15								■											
	c16														■	■				
	c17																			■
	c18														■				■	
	c19																	■		
	d01													■						
	d02													■		■				
	d03																■			
	d04															■				
	d05									■										
	d06												■							
	d07												■							
	d08																■			
	d09												■							
	d10														■			■		
	d11																■			

Table [5] matrix of **"Program ILOs Vs the Program Courses"**.

Course Code	Program ILOs : "Knowledge & Understanding" and "Intellectual" Skills																															
	A01	**A02**	**A03**	**A04**	**A05**	**A06**	**A07**	**A08**	**A09**	**A10**	**A11**	**A12**	**A13**	**A14**	**A15**	**A16**	**A17**	**A18**	**B01**	**B02**	**B03**	**B04**	**B05**	**B06**	**B07**	**B08**	**B09**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**
ARC 211			■					■		■										■		■	■										
ARC 212			■				■			■										■	■	■										■	
ARC 221				■					■																							■	■
ARC 222			■						■	■										■	■												
ARC 231			■																			■											
ARC 232								■														■											
ARC 241	■					■						■	■								■		■						■				
ARC 242	■					■							■								■		■						■				
ARC 311			■				■			■										■	■	■	■						■				
ARC 312			■				■			■										■	■	■							■				
ARC 321			■	■					■																						■		■
ARC 322			■						■	■															■			■					
ARC 323			■						■	■				■						■					■					■	■		■
ARC 341	■					■		■				■	■				■				■	■	■						■				
ARC 342	■					■						■	■				■				■		■						■				
ARC 361						■	■	■												■			■	■	■								
ARC 362							■	■	■											■			■	■	■								
ARC 411			■				■		■											■	■	■							■				
ARC 412			■				■		■					■						■	■	■											
ARC 421			■	■					■	■										■	■										■		■
ARC 422			■	■					■											■													
ARC 451			■	■					■						■					■					■				■		■		
ARC 452			■						■						■	■		■				■									■		■
ARC 453			■							■						■				■		■			■								
ARC 471						■	■														■		■	■									
ARC 472						■						■					■				■		■						■				
ARC 501			■						■	■										■											■		
ARC 502			■				■		■												■	■	■										
ARC 511			■				■		■	■						■				■	■	■									■		■
ARC 551			■	■					■						■					■					■				■		■		
ARC 552			■						■						■	■		■		■		■							■		■		■
ARC 571		■				■	■		■		■	■					■				■			■						■			
ARC 581						■				■										■	■												
ARC 582											■						■			■									■				
ARC E01		■						■														■		■									
ARC E02		■						■														■		■									
ARC E03			■							■											■	■	■					■	■				
ARC E04			■						■	■															■					■	■	■	■
ARC E05				■					■																								■
ARC E06			■						■						■	■		■		■	■		■						■		■	■		■
ARC E07			■						■					■						■												■	■	■
ARC E08						■	■		■			■										■			■				■				
ARC E09			■			■	■		■					■							■								■			■	
ARC E10		■						■														■		■			■						
ARC E11		■						■																■									

Table [5] matrix of **"Program ILOs Vs the Program Courses"**. Cont.

	Program ILOs : Knowledge & Understanding and Intellectual Skills																															
Course Code	**A01**	**A02**	**A03**	**A04**	**A05**	**A06**	**A07**	**A08**	**A09**	**A10**	**A11**	**A12**	**A13**	**A14**	**A15**	**A16**	**A17**	**A18**	**B01**	**B02**	**B03**	**B04**	**B05**	**B06**	**B07**	**B08**	**B09**	**B10**	**B11**	**B12**	**B13**	**B14**	**B15**
BSA H01									■		■									■													
CHM 151	■											■								■						■							
CMP 132		■																						■		■	■						
CSC 101		■																								■							
ENG ELE					■								■																				
ENG KET					■								■																				
E. KETA					■								■																				
E. PET					■								■																				
E. PETA					■								■																				
ENV 101														■																			
GEN 313													■							■													
GRA 141	■																					■											
GRA 142	■																					■											
HUM H09		■						■																■			■						
MAN 121												■								■													
MEC 121	■																		■							■							
MEC 122	■																		■														
MTH 111	■																		■							■							
MTH 112	■																		■							■							
MTH 213	■	■																	■							■							
PHY 131	■																		■							■							
PHY 132	■																		■							■							
PSC 110					■																												
PSY 101					■																												
SCM 214	■					■														■						■			■				
SCM 215	■					■						■								■									■				
SCM 223	■					■														■						■							
SCM 317	■					■						■								■						■			■				
SCM 418	■					■						■								■									■				
SCM 442	■					■						■	■							■						■			■				
SCT 101					■																												
SOC 101					■																												

Table [5] matrix of **"Program ILOs Vs the Program Courses"**. Cont.

	Program ILOs : "Practical & Professional" Skills and "General & Transferable Skills"																												
Course Code	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11
ARC 211	■		■				#								■					■	■			■			■			
ARC 212	■		■												■					■	■			■			■	■		
ARC 221			■																											
ARC 222			■																								■			■
ARC 231															■					■	■									
ARC 232			■												■					■	■									
ARC 241			■		■		■				■		■											■			■			■
ARC 242			■		■						■		■											■						■
ARC 311	■		■											■	■	■			■	■	■			■			■	■		■
ARC 312	■		■												■						■			■			■			
ARC 321			■																											
ARC 322			■																	■	■						■			■
ARC 323																											■			■
ARC 341					■		■						■											■			■			■
ARC 342					■								■											■			■			■
ARC 361	■					■											■										■			
ARC 362	■					■		■									■										■			
ARC 411	■		■												■						■			■			■			
ARC 412	■		■											■	■						■			■						
ARC 421	■																										■			■
ARC 422		■	■																		■	■			■	■	■	■		
ARC 451														■		■		■		■	■				■	■		■		
ARC 452														■		■			■	■	■			■					■	
ARC 453			■											■	■					■	■									
ARC 471					■						■	■	■											■	■	■	■	■		■
ARC 472					■						■	■	■											■				■		■
ARC 501					■															■	■							■		■
ARC 502			■											■		■			■	■	■						■	■		
ARC 511			■											■	■	■			■	■	■			■			■	■		
ARC 551														■		■		■		■	■			■	■	■				
ARC 552														■	■	■			■	■	■			■						
ARC 571	■				■				■				■											■				■		■
ARC 581									■											■										
ARC 582									■	■	■												■							■
ARC E01			■			■	■															■		■			■			
ARC E02			■			■	■															■		■			■			
ARC E03	■		■											■	■					■	■									■
ARC E04																											■			■
ARC E05					■														■											■
ARC E06														■		■			■					■					■	
ARC E07																■				■	■			■						
ARC E08					■																					■	■			
ARC E09		■												■													■			■
ARC E10		■	■			■	■															■		■		■	■			
ARC E11						■	■															■								

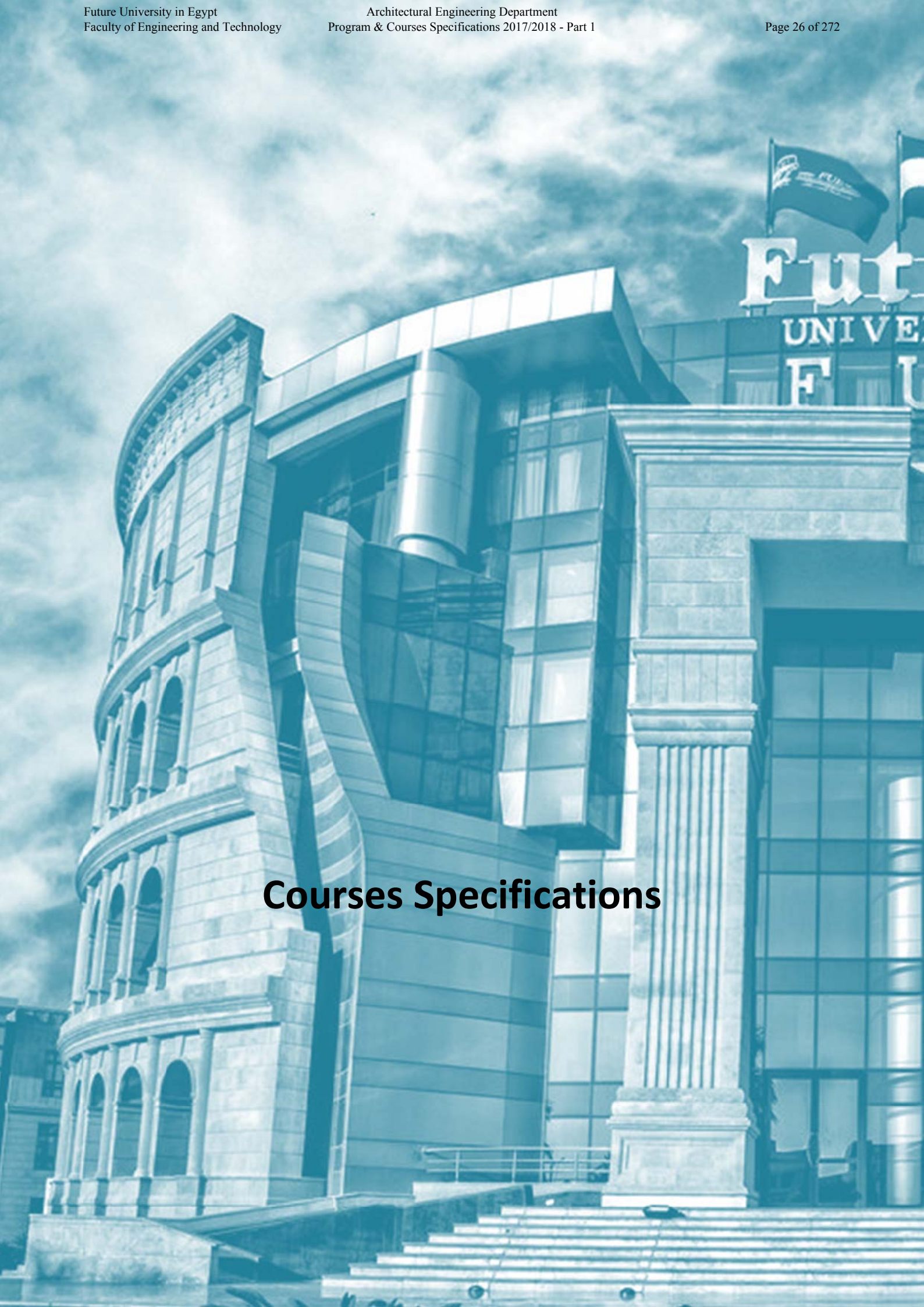
Table [5] matrix of **"Program ILOs Vs the Program Courses"**. Cont.

	Program ILOs : "Practical & Professional" Skills and "General & Transferable Skills"																													
Course Code	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11
BSA H01									■																					
CHM 151				■						■													■			■				
CMP 132	■	■																				■		■						
CSC 101	■																			■						■	■			
ENG ELE																				■						■				■
ENG KET																				■						■				■
E. KETA																				■						■				■
E. PET																				■						■				■
E. PETA																				■						■				■
ENV 101					■															■						■	■			
GEN 313			■												■															
GRA 141			■												■															
GRA 142			■												■															
HUM H09						■	■																	■						
MAN 121								■		■										■			■							
MEC 121	■	■																		■										
MEC 122	■	■																						■						
MTH 111	■	■																		■										
MTH 112	■	■																						■						
MTH 213		■																						■						
PHY 131	■			■																■						■				
PHY 132	■	■		■				■		■										■						■				
PSC 110																				■						■	■			
PSY 101																				■						■				
SCM 214		■																						■				■		
SCM 215								■			■													■				■		
SCM 223				■				■																■				■		
SCM 317												■														■	■			
SCM 418												■								■				■						
SCM 442										■	■	■	■											■				■		
SCT 101																				■						■	■			
SOC 101																				■						■	■			

Table [6] Courses Distribution on Various Subject Areas

Course Code	Course Name	CH @ Bylaw	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering & Design	Computer Applications and ICT	Design Projects & Practice
NARS Range			9-12 %	20-26 %	20-23 %	20-22 %	9-11 %	8-10 %
	%		12.0%	12.0%	22.9%	29.7%	9.1%	14.3%
Sum		175	21	21	40	52	16	25
ARC 211	Architectural Design 1	3				1		2
ARC 212	Architectural Design 2	3				1		2
ARC 221	History & Theories of Architecture 1	2	2					
ARC 222	History & Theories of Architecture 2	2			2			
ARC 231	Graphics & Visual Skills 1	3			3			
ARC 232	Graphics & Visual Skills 2	3			3			
ARC 241	Building Construction & Materials 1	3				3		
ARC 242	Building Construction & Materials 2	3				3		
ARC 311	Architectural Design 3	4				1		3
ARC 312	Architectural Design 4	4				1		3
ARC 321	History & Theories of Architecture 3	2	2					
ARC 322	History & Theories of Architecture 4	2			2			
ARC 323	Human Studies in Architecture	2	2					
ARC 341	Building Construction & Materials 3	4				4		
ARC 342	Building Construction & Materials 4	4				4		
ARC 361	Environmental Control & Technical Installations 1	2			0.5	1	0.5	
ARC 362	Environmental Control & Technical Installations 2	2			0.5	1	0.5	
ARC 411	Architectural Design 5	4				1		3
ARC 412	Architectural Design 6	4				1		3
ARC 421	History & Theories of Architecture 5	3			3			
ARC 422	History & Theories of Architecture 6	3			3			
ARC 451	Urban Planning 1	3			1	2		
ARC 452	Urban Design & Housing 1	3			1	2		
ARC 453	Landscape Architecture	3				2		1
ARC 471	Execution Design 1	4				3	1	
ARC 472	Execution Design 2	4				3	1	
ARC 501	Graduation project studies	2				2		
ARC 502	Graduation Project	5						5
ARC 511	Architectural Design 7	4				1		3
ARC 551	Urban Planning 2	3			1	2		
ARC 552	Urban Design & Housing 2	3			1	2		

Course Code	Course Name	CH @ Bylaw	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering & Design	Computer Applications and ICT	Design Projects & Practice
ARC 571	Execution Design 3	4				3	1	
ARC 581	Project Management and Feasibility Studies	2				2		
ARC 582	Professional Practice and Legislations	2	2					
ARC XXX	Departmental Elective (1)	3					3	
ARC XXX	Departmental Elective (2)	3					3	
ARC XXX	Departmental Elective (3)	3				3		
ARC XXX	Departmental Elective (4)	3	3					
CHM 151	Chemistry 1	2		2				
CMP 132	Computer Programming	2					2	
CSC 101	Introduction to Computer	2					2	
ENG KETA	English Language (1)	2	2					
ENG PETA	English Language (2)	2	2					
GEN 313	Report Writing and Presentation Skills	2			2			
GRA 141	Graphics 1	2			2			
GRA 142	Graphics 2	2			2			
MAN 121	Production Technology	2				2		
MEC 121	Mechanics 1	2		2				
MEC 122	Mechanics 2	2		2				
MTH 111	Differentiation with Applications and Algebra (Math 1)	3		3				
MTH 112	Integration with Applications and Analytical Geometry (Math 2)	3		3				
MTH 213	Mathematics, Statistics & Computers	3		1			2	
PHY 131	Physics 1	4		4				
PHY 132	Physics 2	4		4				
PSC 110	Human Rights	2	2					
SCM 214	Theory of Structures	3			3			
SCM 215	Properties & Strength of Materials	2			2			
SCM 223	Surveying	2			2			
SCM 317	Reinforced Concrete for Architects	2			2			
SCM 418	Steel Structures for Architects	2			2			
SCM 442	Foundations for Architects	3			2	1		
	University Elective (1)	2	2					
	University Elective (2)	2	2					



Courses Specifications

جـــــامـــــعة المســـــتقبل

FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 211: Architectural Design (1)
"*Creativity*"

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two –3rd semester
Date of specification approval:	November 2017

A- Basic Information

Title: Architectural Design (1) **Code: ARC 211**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **4 Hrs.**
Total: **6 Hrs.**

Prerequisite:
GRA 141: Graphics 1 (Credit Hours 2) OR GRA 142: Graphics 2 (Credit Hours 2)

B- Professional Information

1- Catalog Course Description:

The main concern and focus of this course will be about the "Creative Thinking" design process. The design process will focus mainly on methods of generating creative ideas considering simple functional needs, simple structures for small scale buildings, simple design problem solving. The course projects may be such as: a pavilion in a public garden, a bus station, a sightseeing kiosk, a small or medium span exhibition hall, and similar ones.

2- Overall aims of the course:

The main aims of this course are to:
1. Build student's awareness of the creative design process.
2. Train student to express ideas verbally and graphically.
3. Train student to think creatively.

3- Intended learning outcomes of course (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.

A08 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques.

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information.

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

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions.

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.

C07 Build architectural physical and computer models

C15 Display imagination and creativity.

D01 Communicate effectively.

D02 Discuss and defend ideas.

D05 Manage tasks and resources

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

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

Upon successful completion of the course, the student should be able to:

a1. Define the theoretical bases upon which small scale Pavilions and exhibition halls are designed.
a2. Define the design process as a particular set of sequential operations.
a3. Define what is meant by design problem.
a4. Define different architectural rendering techniques.

b- <u>Intellectual skills:</u>

Upon successful completion of the course, the student should be able to:

b1. Use analytical thinking methods to define design problems.
b2. Use creative thinking methods to propose different design alternatives.
b3. Evaluate design alternatives.

c- <u>Professional and practical skills:</u>

Upon successful completion of the course, the student should be able to:

c1. Design architectural projects in light of spatial and aesthetic requirements.
c2. Apply creative concepts and methods to develop his/her design.
c3. Create diagraming and conceptual 2D & 3D sketches to express and develop his/her design.
c4. Use proper presentation techniques to represent his/her final design proposal.
c5. Build simple physical study models.

d- General and transferable skills:

Upon successful completion of the course, the student should be able to:

d1. Express his/her ideas by visual, graphic, written and verbal means
d2. Discuss and defending his/her ideas.
d3. Manage time and meet deadlines.
d4. Search for relevant information.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Tot.
1	**First Project** Orientation Lecture. Nth dimension experience. Group work project How to form a team and how to work cooperatively	4	0	6
	Project concept discussion, small group discussion	0	2	
2	Architecture Drafting Assignment (Plans)	1	2	6
	Architecture Drafting Assignment (Sections)	1	2	
3	Architecture Drafting Assignment (Elevation)	1	2	**6**
	First Project submission	0	3	
4	**Second Project** Orientation Lecture. How to define and prepare research items, project problem investigation.	3	0	6
	How to present your research outputs. Research data review	1	2	
5	Research Presentation.	1	2	6
	1st sketch design: model: concept + keywords (individual work)	0	3	
6	Pin up & group discussion + design development	2	1	6
	2nd sketch design: model: concept + keywords (individual work)	0	3	
7	Pin up & group discussion + design development	2	1	**6**
	Final submission of 1st project and evaluation	1	2	
8	**Third Project** orientation lecture	4	2	6
	Research data review (group work)	0	1	
9	Research final submission (group work)	1	2	6
	1st sketch design: concept + keywords (individual work)	0	3	
10	Pin up & group discussion + design development + lecture	2	1	6
	Design development: plans + section + elevation + 3d view	1	2	
11	2nd sketch design: plans + section + elevation or 3d view	0	2	6
	Pin up & group discussion + design development + lecture	2	1	
12	Design development	1	2	6
	3rd sketch design: plans + section + elevation + 3d view	0	3	
13	Pin up & group discussion + design development + lecture	2	2	6
	Design development	0	2	
14	Project finishing	0	3	**6**
	Project finishing	0	3	
15	Project finishing	0	3	**6**
	Final submission of second project	0	3	
Total		**30**	**60**	**90**

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%
- Year's work: 50%
  - Submission of Nth Dimension Project 5 %
  - Submission of Drafting Project 5 %
  - Sketch Design (1): Model + Concept 5 %
  - Submission of 2nd Project 5 %
  - Sketch Design (1) & One-day Esquisse 10%
  - Sketch Design (2) & External Esquisse 10%
  - Sketch Design (3) & One-day Esquisse 10%
- Participation "Submission of 3rd Project" 10 %

- **Total 100%**

9- List of references:

1. **Text Book:**
   Unwin, Simon.:
   Exercises in Architecture: Learning to Think as an Architect, Routledge; 2012.

2. **Recommended Readings:**

   - Neufert, E.:, Architects' Data; The Handbook of Building Types, Third Edition, Blackwell Publishing, 2002, The Alden Group Ltd., Oxford & Northampton, metric edition.
   - Ramsey, C.; Ray, J. & Hoke, Jr.: ***Architectural Graphic Standards***, Tenth Edition - metric, AIA. John Wiley & Sons Inc., 2000, NJ. USA
   - Chiara, J.: ***Time Saver Standards for Architectural Design***, Most recent metric version
   - Francis D.K. Ching: **Architecture: Form, Space and Order**.
   - Architectural Magazines and Projects
   - Periodicals & Web sites:
     - Architecture
     - Architectural Record
     - Architectural Review
     - Architecture d'aujourdhui
     - www.architecturalrecord.com
     - www.greatbuildings.com

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data show for presentations
- Architectural Library
- 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	A08	A10	B02	B04	B05	C01	C03	C07	C15	D01	D02	D05	D08
Course ILOs	a1.	●													
	a2.	●													
	a3.			●											
	a4.		●												
	b1.				●										
	b2.					●									
	b3.						●								
	c1.							●							
	c2.										●				
	c3.								●						
	c4.								●						
	c5.									●					
	d1.											●			
	d2.												●		
	d3.													●	
	d4.														●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	c4	c5	d1	d2	d3	d4
First Project Orientation Lecture. 4th dimension experience. Group work project How to form a team and how to work cooperatively		●	●		●			●	●	●	●		●			
Project concept discussion, small group discussion		●	●			●	●	●	●	●	●		●	●	●	
Architecture Drafting				●						●	●					
1st Project Orientation Lec.	●		●													
How to present your research outputs				●							●		●			●
Research Presentation	●										●		●	●	●	●
design sketches (1&2)	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Pin up & group discussion + design development	●	●	●		●	●	●	●	●	●	●	●	●	●	●	
2nd Project orientation Lec.	●		●													
Research Presentation	●			●	●								●	●	●	●
design sketches (1,2&3)	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Pin up & group discussion + design development	●	●	●		●	●	●	●	●	●	●	●	●	●	●	
3rd Project orientation Lec.			●													●
Third Project submittal (One day sketch Design)			●	●	●	●		●	●	●	●		●		●	

Table [3]: Teaching Method/ILO Matrix																
Teaching Method	a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	c4	c5	d1	d2	d3	d4
Lecture	●	●	●		●	●			●							
One to One Discussion	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Small Groups Discussion		●	●		●	●	●	●	●	●	●		●	●		
Public Group Discussion	●	●	●	●	●	●	●	●	●	●	●		●	●		
Physical Maquette				●							●	●				
Search for Data (Self-study)	●				●		●								●	●
Research Presentation											●		●	●	●	
Sketch Designs			●	●	●	●	●	●	●	●	●		●		●	

Table [4]: Assessment Method/ILO Matrix																
Assessment Method	a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	c4	c5	d1	d2	d3	d4
Research Document	●		●		●		●						●	●	●	●
Oral presentations	●	●	●		●	●	●						●	●	●	
Sketch Designs	●	●	●	●	●	●	●	●	●	●	●		●		●	
Physical Maquette												●				
Final exam	●		●			●		●	●	●	●		●		●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 212: Architectural Design (2)
"*Creativity within Functionality*"

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programme:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two – 4th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Architectural Design (2) **Code: ARC 212**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **4 Hrs.**
Total: **6 Hrs.**

Prerequisite:
ARC 211 - Architectural Design (1)

B- Professional Information

1- Catalog Course Description:

The main concern and focus of this course will be about the "Problem Solving" design process. The design process will be approached as a method of finding solutions for functional, environmental, and structural needs and problems. This will be as important as the need for generating creative and innovative ideas as the creative thinking methods should be well rooted in the prerequisite "Architectural Design (1)" course. The student will address various issues such as functional relations, circulation patterns, qualitative and quantitative study of architectural spaces, relationships between spaces and required openings, the effect of openings upon facades, human / environmental / functional relations, simple structures for small scale buildings, and similar issues. The course projects may be such as: a Celebrity Residence, Chalet, Youth Hostel, an Exploration Center, a Kindergarten, Kids' Arts Center, Children's' Library/Museum and similar projects.

2- Overall aims of the course:

The main aims of this course are to:

1. Enhance student's awareness of creative design process within a set of moderate functional limitations.
2. Train student to defend and criticize ideas verbally and graphically.
3. Train student to think critically.

3- Intended learning outcomes of course (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.

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information.

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

B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment

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.

D01 Communicate effectively.

D02 Discuss and defend ideas.

D05 Manage tasks and resources

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

D09 Work under stressful environments and within constraints of time and budget

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

Upon successful completion of the course, the student should be able to:

a1. Define the theoretical bases upon which a private residence is designed.
a2. Define different site constrains.
a3. Explain what is meant by design problem.

b- <u>Intellectual skills:</u>

Upon successful completion of the course, the student should be able to:

b1. Apply analytical thinking methods to define design problems.
b2. Apply creative thinking methods to propose different design alternatives.
b3. Analyze site constrains and limitations.

b4. Appraise spatial forms and their aesthetic values.

c- Professional and practical skills:

Upon successful completion of the course, the student should be able to:

c1. Design architectural projects in light of spatial, aesthetic, and functional requirements.

c2. Apply creative concepts and methods to develop his/her design.

c3. Create 2D & 3D sketches to express and develop his/her design.

c4. Use proper presentation techniques to represent his/her design proposal.

d- General and transferable skills:

Upon successful completion of the course, the student should be able to:

d1. Express his/her ideas by visual, graphic, written and verbal means

d2. Discuss and defending his/her ideas.

d3. Manage time and meet deadlines.

d4. Search for relevant information.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

#	Topic	Lec	Tut	Tot.
#1	**Residential Design Project: Start and Orientation** AND One day sketch "Sleeping Zone Space Design"	2	1	6
	Research Data Review (Group Work) AND One day sketch "Guest Zone Space Design"	2	1	
#2	**Final Research Submission and Group Discussion** (Group Work)	3	0	6
	Individual work: Concept with keywords, Detailed Program, Relationship Matrix, Bubble Diagram, Site analysis, and Site Zoning	0	3	
#3	**Pin-up and Group Discussion: Volumetric Zoning, Schematic Plans,** Concept with keywords, Detailed Program, Relationship Matrix, Bubble Diagram, Site analysis, and Site Zoning	4	0	6
	Individual work: Project Development	0	2	
#4	Individual work: Project Development	0	3	6
	1st Sketch Design: Work at Studio then submittal **Volumetric Zoning, Schematic Plans,** Concept with keywords, Detailed Program, Relationship Matrix, Bubble Diagram, Site analysis, and Site Zoning	0	3	
#5	General Criticism + Project Development	3	0	6
	Individual work: Schematic Elevations, Schematic Sections, Layout, Plans, Concept with keywords, Detailed Program, Relationship Matrix, Bubble Diagram, Site analysis, and Site Zoning	0	3	
#6	**Pin-up and Group Discussion:** Elevations, Sections, Layout, Concept with keywords, Site analysis, and Site Zoning	4	0	6
	Individual work: Project Development	0	2	
#7	Individual work: Project Development	0	3	6
	2nd Sketch Design: Work at Studio then submittal Elevations, Sections, Layout, Concept with keywords, Detailed Program, Relationship Site analysis, and Site Zoning	0	3	
#8	General Criticism + Project Development	3	0	6
	Individual work: Project Development	0	3	
#9	**Pin-up and Group Discussion**	3	0	6
	3rd Sketch Design: Work at Studio then submittal + Orientation	0	3	
#10	Individual work: Project Development	0	6	6

# 11	**One day sketch design: External Design Project**	0	3	6
	General Criticism	3	0	
# 12	Project developing	0	6	6
# 13	General Criticism	3	0	6
	Project Finishing	0	3	
# 14	**Project Preliminary (Pencil) Submittal**	0	3	6
	Project Finishing	0	3	
#15	Project Finishing	0	3	6
	Project Submittal	0	3	
Total		30	60	90

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%
- Year work: 50%
  - Group Research 5 %
  - 1st Sketch Design 5 %
  - 2nd sketch Design 5 %
  - 3rd sketch Design 5 %
  - One day External Sketch Design 10%
  - Preliminary Submission of Final Project 5 %
  - Submission of Final Project 15 %
- Participation 10%
- **Total 100%**

9- List of references:

1. **Text Book:**
   Unwin, Simon.:
   Twenty Buildings Every Architect Should Understand, Routledge; 2 edition, 2014
2. **All course notes and lectures are uploaded on the "Moodle"**
3. **Recommended Readings:**
   - Neufert, E.:, Architects' Data; The Handbook of Building Types, Third Edition, Blackwell Publishing, 2002, The Alden Group Ltd., Oxford & Northampton, metric edition.
   - Ramsey, C.; Ray, J. & Hoke, Jr.: ***Architectural Graphic Standards***, Tenth Edition - metric, AIA. John Wiley & Sons Inc., 2000, NJ. USA
   - Chiara, J.: ***Time Saver Standards for Architectural Design***, Most recent metric version
   - Francis D.K. Ching: **Architecture: Form, Space and Order**.
   - Architectural Magazines and Projects

- Periodicals & Web sites:
  - Architecture
  - Architectural Record
  - Architectural Review
  - Architecture d'aujourdhui
  - www.architecturalrecord.com
  - www.greatbuildings.com

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data show for presentations
- Architectural Library
- 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	A10	B02	B03	B04	B13	C01	C03	C15	D01	D02	D05	D08	D09
Course ILOs	a1.	●														
	a2.		●													
	a3.			●												
	b1.				●											
	b2.						●									
	b3.					●										
	b4.							●								
	c1.								●							
	c2.										●					
	c3.									●						
	c4.									●						
	d1.											●				
	d2.												●			
	d3.													●		●
	d4.														●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
One day sketch "Sleeping Zone Space Design"	●			●						●	●			●	
One day sketch "Guest Zone Space Design"	●			●						●	●			●	
Final Research Submission and Group Discussion		●	●									●	●	●	●
Project Concept & Program	●	●	●	●	●	●	●	●	●	●					
Pin-up and Group Discussion		●	●	●	●	●	●	●	●		●		●		
Project Development		●	●	●	●	●	●	●	●	●	●	●			
Sketch Designs			●	●	●	●	●	●	●	●	●	●		●	
General Criticism	●	●	●	●		●	●						●		
One day sketch design			●	●	●	●	●	●	●	●	●	●		●	
Final Project Submittal							●	●		●	●	●		●	

Table [3]: Teaching Method/ILO Matrix

Topic	a1	a2	a3	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Lecture	●	●				●									
One to One Discussion	●	●	●	●	●	●	●	●	●	●			●		
Public Group Discussion	●	●	●	●	●	●	●	●	●		●	●	●	●	
Search for Data (Self-study)								●	●						●
Research Presentation											●	●	●	●	●
Sketch Designs	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3	d4
Research Document			●									●		●	●
Oral presentations	●	●	●	●	●		●						●	●	
Sketch Designs	●	●	●	●	●	●	●	●	●	●	●	●		●	
Final exam		●	●	●	●	●	●	●	●	●	●	●		●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 221: History & Theories of Architecture 1

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two – 1st Semester
Date of specification approval:	November 2017

A- Basic Information

Title: History & Theories of Architecture 1 **Code: ARC 221**

Credit Hours: **2 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **0 Hrs.**
Total: **2 Hrs.**
Prerequisite: None

B- Professional Information

1- Catalog Course Description:

The study deals with different topics like history of each period, geology & climate, materials, construction systems, architectural character and analysis for examples.
The periods are:
Ancient Egyptian - Mesopotamia - Greek - Roman - Early Christianity - Byzantine - Renaissance - Baroque - Rococo.

2- Overall aims of the course:

The main aims of this course are to:

- Build the student's knowledge of the architectural styles and theories of these eras:
  - Before Christianity.
  - Early Christianity.
  - Baroque & Rococo

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

A04 Demonstrate knowledge and understanding of history of architecture, urban, and regional planning across different eras

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

B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment .

B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.

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

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. Explain the famous and great buildings of the specified periods
a.2. Explain the Ancient civilizations of the specified periods
a.3. Explain the development of the historical architecture

b- Intellectual skills:

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

b.1. Compare the effective factor elements for different historical architectures.
b.2. Differentiate the Impact between civilization and architecture.

c- Professional and practical skills:

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

c.1. Apply the difference between styles of the historical architecture in architectural design.
c.2. Apply principles of the historical architectural design and construction methods.

d- General and transferable skills:

N/A

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

Week	Topics	Hr.
1&2	Ancient Egyptian Architecture	4
3	Mesopotamian	2
4&5	Greek	4
6&7	Roman	4
8	Early Christian	2
9	Byzantine	2
10&11	Renaissance	4
12	Baraque	2
13	Rococo	2
14&15	Terminology and definitions	4
Total		30

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%
- Year work:
  - In Class Quizzes 20%
  - Assignments 30%
  - Participation 10%

9- List of references:

1. **Text Book:**
   Fletcher, Banister. ***"A History of Architecture on the comparative method"*** 2012 Edition.
2. **References:**
   Kevin Espina "***History of Architecture***" Aug 2013

10- Facilities required for teaching and learning:

- Lecture Room
- White board
- Computer & data show for presentations
- Internet connection.
- Architectural Library

Course coordinator: **Prof. Dr. Yousef El Rafie**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs					
		A 03	A 04	A 09	B 13	B 15	C 03
Course ILOs	a1.	●					
	a2.	●	●				
	a3.			●			
	b1.				●		
	b2.					●	
	c1.						●
	c2.						●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	b1	b2	c1	c2
Ancient Egyptian Architecture	●	●	●	●	●	●	●
Mesopotamian Architecture	●	●	●	●	●	●	●
Greek	●	●	●	●	●	●	●
Roman	●	●	●	●	●	●	●
Early Christian	●	●	●		●	●	
Byzantine	●	●	●	●	●	●	
Renaissance	●	●	●	●	●	●	●
Baraque	●						
Rococo	●						

Table [3]: Learning Method/ILO Matrix

Topic	a1	a2	a3	b1	b2	c1	c2
Lecture	●	●	●	●	●	●	●
Assignment	●			●	●	●	●
Participation					●		

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	b1	b2	c1	c2
Assignment	●			●	●	●	●
In class Quiz			●	●	●	●	
Final Exam	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 222: History & Theories of Architecture (2)

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 Two – 3rd semester
Date of specification approval:	November 2017

A- Basic Information

Title: History & Theories of Architecture (2) **Code: ARC 222**

Credit Hours: **2 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **0 Hrs.**
Total: **2 Hrs.**

Prerequisite: N/A

B- Professional Information

1- Catalog Course Description:

The course focuses on the methods of creative thinking based on writings of "*Edward De Bono*". In addition, student will learn about the relation between form and space and how to define a space. Also, student will learn about circulation spaces and their characteristics.

2- Overall aims of the course:

The main aims of the course are to build the student's knowledge regarding:

a. "*Edward de Bono*" creative thinking methods and techniques.
b. The architectural design process.
c. The architectural space definers and functional manipulation.
d. The anthropometric data and its relation to the space design.

3- Intended learning outcomes of course (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.

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

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information.

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

B10 Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.

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

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

D11 Refer to relevant literatures

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. List some of the creative thinking methods.
a2. Define the golden ratio and how it affects architecture buildings.
a3. Define the relation between human dimensions and functional spaces needs.
a4. Define the design process.
a5. Define the different types of space definers.
a6. Point out space characteristics according to its definers and openings
a7. Differentiate between functional and circulation spaces.

b- Intellectual skills:

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

b1. Think creatively based on de Bono's systematic methods.
b2. Use critical methods to analyze architectural spaces.

c- Professional and practical skills:

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

c1. Use appropriate graphic techniques to point out spaces characteristics.

d- General and transferable skills:

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

d1. Search for information and adopt life-long self-learning.
d2. Refer to relevant literatures.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

	Topics	Weeks
1	Design Process: What Is Creativity	1
2	Design Process: Creative Thinking; Lateral Thinking: Challenge	1
3	Design Process: Creative Thinking; Lateral Thinking: Alternatives	1
4	Design Process: Creative Thinking; Lateral Thinking: Provocation	2
5	Design Process: Data Gathering; Who do we design for? (Human Dimensions)	2
6	Design Process: Problem Definition and data analysis & synthesis	2
7	Design Process: Data Gathering; What are the building type requirements? (Circulation)	3
8	Space Definition	3
Total		15

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%
- Year work:
  - In Class Quizzes 15%
  - Homework assignments 15%
  - Participation 10%
  - Mid-term examinations 30%

9- List of references:

1. **Text Book:**
   Ching, Francis D.K., **Architecture Space, Form, and Order**. 2014
2. **Students Lecture Notes.**
3. **Handouts.**
4. **Recommended Readings:**
   a) Crosbie, Wattson: Time Saver Standards for Architectural Design Data. 1997
   b) De Bono, E., Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas, HarperCollins, 1995

10- Facilities required for teaching and learning:

- Lecture Room.
- White board.
- Computer & Data Show for Presentations + Internet Connection.
- Architectural Library.

Course coordinator: **Prof. Dr. Osama Elrawi**
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	A09	A10	B02	B03	C03	D08	D11
Course ILOs	a1.	●							
	a2.		●						
	a3.			●					
	a4.	●							
	a5.	●							
	a6.		●						
	a7.		●						
	b1.					●			
	b2.				●				
	c1.						●		
	d1.							●	
	d2.								●

Table [2]: Course Content/ILO Matrix

Topic	a1.	a2.	a3.	a4.	a5.	a6.	a7.	b1.	b2.	c1.	d1.	d2.
Design Process: What Is Creativity	●			●				●	●			
Design Process: Creative Thinking; Lateral Thinking: Challenge	●			●				●				
Design Process: Creative Thinking; Lateral Thinking: Alternatives	●			●				●				
Design Process: Creative Thinking; Lateral Thinking: Provocation	●			●				●				
Design Process: Data Gathering; Who do we design for? (Human Dimensions)	●	●	●						●		●	●
Design Process: Problem Definition and data analysis & synthesis	●					●	●		●	●		
Design Process: Data Gathering; What are the building type requirements? (Circulation)	●				●	●	●		●		●	●
Space Definition					●	●	●		●	●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1.	a2.	a3.	a4.	a5.	a6.	a7.	b1.	b2.	c1.	d1.	d2.
Lecture	●	●	●	●	●	●	●	●	●	●		
Research					●	●	●			●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1.	a2.	a3.	a4.	a5.	a6.	a7.	b1.	b2.	c1.	d1.	d2.
Research					●	●	●			●	●	●
Assignments								●	●	●		●
Written Exam	●	●	●	●	●	●	●	●	●	●		

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 231: Graphics & Visual Skills (1)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two - 3rd semester
Date of specification approval:	November 2017

A- Basic Information

Title: Graphics & Visual Skills (1) **Code: ARC 231**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: None

B- Professional Information

1- Catalog Course Description:

Credit Hours: 3

Introducing various drawing principles and artistic techniques: Pencil techniques, Pen and ink, Proportions perspective, Scale and composition, Foreground, Middle and background, Sketching architectural elements and landscapes.

Lecture Hours 2 Exercise/Lab 2

2- Overall aims of the course:

The aims of this course are to:

- Build the student's knowledge regarding the visual design elements and theories.
- Train the student to visualize and represent 2D and 3D compositions.
- Train the student to use free hand sketching skills.
- Train the student how to percept forms and compositions.

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.

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

C15 Display imagination and creativity.

D01 Communicate effectively.

D02 Discuss and defend ideas.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define the term "Design" as process and product.
a2. Identify the different types of arts.
a3. Identify the "Basic ingredients".
a4. Identify the "Drawing process"(seeing, imagining and representing).
a5. Identify the gestalt theory of perception.
a6. Define the term "Drawing".
a7. Identify the "Multi-view drawings".
a8. Identify "Space and Depth".
a9. Identify "Entourage".
a10. Identify the purposes of the drawing from observation.
a11. Identify the "Basic concepts "of light, shade and shadow.
a12. Learn how to draw and to use drawing effectively as an instrument in design.

b- Intellectual skills:

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

b1. Use drawing as a cognitive process that involves perceptive seeing and visual thinking.
b2. Analyze shapes and forms depending on proportions, ratios, positions and relation-ships.
b3. Evaluate, analyzing drawings from the visual point of view.
b4. Justify decisions about choices of appropriate drawing techniques, media relevant to design stages.
b5. Explore new drawing techniques and methods.
b6. Use relevant appropriate terms to discuss the fundamentals of visual arts.

c- Professional and practical skills:

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

c1. Sketch freehand from observation, by pencils, ink pens and felt-tipped pens.
c2. Inscribe lines and laying down tonal values.
c3. Relate, draw and delineate the architectural orthogonal Multiview of simple small architectural projects.

d- General and transferable skills:

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

d1. Use graphical means to communicate effectively.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

Topic	Lecture	Tutorial	Total
Introduction and course orientation	2 hrs.	2 hrs.	4 hrs.
Pencil techniques- Values – Creating space and volume	2 hrs.	2 hrs.	4 hrs.
Ink techniques- Values – Creating space and volume	2 hrs.	2 hrs.	4 hrs.
Landscape drawings and entourage (pencil-ink)	4 hrs.	4 hrs.	8 hrs.
Pencil / ink Art work and silent nature	4 hrs.	4 hrs.	8 hrs.
Pencil colors techniques + Art work + Architectural Drawings	4 hrs.	4 hrs.	8 hrs.
watercolors techniques + Art work + Architectural Drawings	4 hrs.	4 hrs.	8 hrs.
Patterns/ optical illusion	4 hrs.	4 hrs.	8 hrs.
Collective art work project	4 hrs.	4 hrs.	8 hrs.
TOTAL	30 hrs.	30 hrs.	60 hrs.

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%
- Year work:
  - Final project 10%
  - Assignments/Studio work 40%
  - Participation 10%

9- List of references:

1. **Text Book:**
   - Architectural Drawing; A Visual Compendium of Types & Methods, Rendow Yee, Wiley & sons 2013.
   - Art Fundamentals: Theory and Practice, Otto Ocvirk, McGraw-Hil
2. Recommended Readings:
   a) Francis, D. K. Ching with Steven. Design Drawing, second edition. Johnwiley, Hoboken, New Jersey.
   b) Laurie Schneider Adams. (2004).Ahistory Of Western Art. Fourth edition MC Graw Hill publications. Publisher: Lyn uhl Mark Getlein.
   c) Living with Art. (Seven edition) publisher. Lyn uhl Mark Getlein.

10- Facilities required for teaching and learning:

- Design Studios.
- White board.
- Data show for presentations.
- Architectural Library.

Course coordinator: **Dr. Mohamed El Adly**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs				
		A03	B04	C15	D01	D02
Course ILOs	a1.	●				
	a2.	●				
	a3.	●				
	a4.	●				
	a5.	●				
	a6.	●				
	a7.	●				
	a8.	●				
	a9.	●				
	a10.	●				
	a11.	●				
	a12.	●				
	b1.		●			
	b2.		●			
	b3.		●			
	b4.		●			
	b5.		●			
	b6.		●			
	c1.			●		
	c2.			●		
	c3.			●		
	d1.				●	●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1
Introduction and course orientation	●	●	●			●						●					●					
Pencil techniques- Values – Creating space and volume	●		●			●					●	●	●	●		●	●	●	●	●		
Ink techniques- Values – Creating space and volume	●		●			●					●	●		●		●	●	●	●	●		
Landscape drawings and entourage (pencil-ink)		●		●	●			●	●	●	●	●		●	●				●			
Pencil / ink Art work and silent nature				●	●	●	●	●	●	●	●	●		●	●		●		●	●		●
Pencil colors techniques + Art work + Architectural Drawings				●	●	●		●		●	●	●		●	●		●					●
watercolors techniques + Art work + Architectural Drawings				●	●	●		●		●	●	●		●	●		●					●
Patterns/ optical illusion	●	●	●	●	●			●				●	●	●					●			
Collective art work project	●		●	●	●	●					●	●	●	●	●	●		●			●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1
Lecture	●		●		●		●	●	●		●	●		●			●	●		●	●	
Physical Maquette		●	●					●					●	●		●		●				●
Assignment	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Class Work	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix																						
Assessment Method	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1
Assignment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Physical Maquette		●	●					●					●	●				●				●
Class Work	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Exam(s)			●			●	●	●	●		●	●	●	●		●	●	●	●	●		●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 232: Graphics & Visual Skills (2)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two - 4th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Graphics & Visual Skills (2) **Code: ARC 232**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite: ARC 231: Graphics & Visual Skills (1)

B- Professional Information

1- Catalog Course Description:

The course examines the language of architectural form and deals with the techniques of analyzing and representing it by different means of rendering. The course includes lectures, problem solving and exercises.

Topics include:

- Shade and Shadow: Fundamentals; shade of points, lines, planes, and volumes. Exercises on shade and shadow of different architectural elements; arches, stairs, curves, etc.
- Perspective: Fundamentals of perspective; plane of image, position of the observer, cone of vision, angles of vision, vanishing points (one point, two points), Architectural perspective. Shade and shadow in perspective.

2- Overall aims of the course:

The aims of this course are to train student to:

- Visualize & Represent architectural forms based on scientific methods.
- Represent architectural drawings by means of shades, shadows, and perspective shots..

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A08 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques.

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

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

C15 Display imagination and creativity.

D01 Communicate effectively.

D05 Manage tasks and resources.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Differentiate between shade and shadow.
a2. Examine the fundamentals of shadow (shadow of points, lines, planes and volumes)
a3. Examine the fundamentals of perspective (picture plane, position of the observer, cone of vision and vanishing points)
a4. Differentiate between different types of perspective.

b- Intellectual skills:

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

b1. Apply shadow principles in exercises & architectural project
b2. Select proper perspective type for buildings.

c- Professional and practical skills:

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

c1. Draw accurately the architectural shade and shadow.
c2. Draw accurately different perspective types for buildings.
c3. Use freehand sketches to draw building perspectives.

d- General and transferable skills:

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

d1. Communicate effectively with other people using visual, graphic, written and verbal means.
d2. Manage time and meet deadlines.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Introduction to the main defination of SHADE & SHADOW & draw shadow of point.	2	2	4
2	SHADOWS OF LINES	2	2	4
3	SHADOWS OF PLANES (basic shapes: regular and irregular shapes intersectional planes).	4	4	8
4	SHADE &SHADOWS OF VOLUMES: Cube, cone, cylinder and pyramid in different ways.	4	4	8
5	ARCHITECTURAL APPLICATIONS: An application of shade and shadows on some architectural elements (i.e.: minerates, entrances, stairs, …)	4	4	8
6	INTRODUCTION TO PERSPECTIVE: How to use it in architecture (basic way to draw perspective) with imperical way.	2	2	4
7	DRAWING PERSPECTIVE WITH TWO VANISHING POINTS (ARCHITECTURAL APPLICATION).	6	6	12
7	INTERIOR PERSPECTIVE	2	2	4
8	PERSPICTIVE RENDRING (shade& shadow and reflection)	2	2	4
Total		28	28	56

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%
- Year work: 50%
  - In Class Quizzes 20%
  - Assignments 30%
- Performance & Participation 10%

9- List of references:

1. **Text Book:**
   Yee, Rendow.- Architectural Drawing A Visual compendium of Types and Methods- Wiley, 2013
2. **Students Lecture Notes**
3. **Recommended Readings:**

- LEVINSON, Edward D. – ***Architectural Rendering Fundamentals*** – N.Y.: McGraw-Hill, 1983.
- LIN, Mike W. – ***Architectural Rendering Techniques / A Color Reference*** – N.Y.: Wiley, 1985.
- MONTAGUE, John – ***Basic Perspective: A visual Approach*** – 3rd Ed. – N.Y.: Wiley, 1998.
- UDDIN, M. Saleh – ***Axonometric & Oblique Drawing: A 3-D Construction, Rendering, & Design Guide*** – N.Y.: McGraw-Hill, 1997.

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer with Data show for presentations
- Architectural Library
- Internet Connection

Course coordinator: **Dr. Mohamed El Adly**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs					
		A08	B04	C03	C15	D01	D05
Course ILOs	a1.	●					
	a2.	●					
	a3.	●					
	a4.	●					
	b1.		●				
	b2.		●				
	c1.			●			
	c2.			●			
	c3.			●	●		
	d1.					●	
	d2.						●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	c1	c2	c3	d1	d2
Introduction to the main defination of SHADE & SHADOW & draw shadow of point.	●	●			●		●				●
SHADOWS OF LINES		●			●		●				●
SHADOWS OF PLANES		●			●		●			●	●
SHADE &SHADOWS OF VOLUMES	●	●			●		●				●
ARCHITECTURAL APPLICATIONS		●			●		●			●	●
INTRODUCTION TO PERSPECTIVE			●	●		●		●			●
DRAWING PERSPECTIVE WITH TWO VANISHING POINTS (ARCHITECTURAL APPLICATION).			●			●		●			●
INTERIOR PERSPECTIVE			●	●		●		●			●
PERSPICTIVE RENDRING								●	●		●

Table [3]: Learning Method/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	c1	c2	c3	d1	d2
Lecture	●	●	●	●							
Class Work	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	c1	c2	c3	d1	d2
Assignment	●	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●		●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 241: Building Construction and Materials (1)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two – 3rd semester
Date of specification approval:	November 2017

A- Basic Information

Title: Building Construction and Materials (1) **Code: ARC 241**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite:
GRA 141: Graphics 1 (Credit Hours 2) OR GRA 142: Graphics 2 (Credit Hours 2)

B- Professional Information

1- Catalog Course Description:

General introduction, Drawing techniques, Abbreviation symbols, Dimensioning, Technical presentation, Understanding types of structures, Wall bearing & skeleton types.
Traditional Construction Method; Load bearing walls. Using brick to build load bearing elements: foundation design, walls, jack arch floors, vaults and domes. Introduction to RC skeleton system.

2- Overall aims of the course:

The aims of this course are to:

- Build the students awareness regarding:
  - The main conventional construction systems (load bearing walls and R.C. skeleton system)
  - The main threats the building may experience and how to protect it against.
  - The main structural rule of thumbs used to size the structural components.
  - Some Arabic site jargon terms.
- Train the student to:
  - Draw some architectural details.
  - Propose solutions for some basic constructional problems.

3- Intended Learning Outcomes (ILOs)

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic applied and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques.

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline.

A13 Demonstrate knowledge and understanding of site jargon, technical language and report writing styles and rules.

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions

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

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

C05 Prepare and present technical reports, working drawings, and construction documents for design projects.

C07 Build architectural physical and computer models.

C11 Apply quality assurance procedures and follow codes and standards.

C13 Use appropriate construction techniques and materials to specify and implement different designs.

D05 Manage tasks and resources

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

D11 Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. List different types of shallow foundations.
a2. Explain the loads transferring method and effect in flat and curved surfaces.
a3. List some types of: water proofing and heat insulation materials.
a4. List different brick types according to their function and manufacturing components.
a5. List some of different brick bonding methods.
a6. Choose the proper site jargon that suits the scientific term.

b- <u>Intellectual skills:</u>

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

b1. Differentiate between structural and non-structural building components.
b2. Select proper structural system accordingly with building needs, offering and limitations.
b3. Propose building problems causes.

c- <u>Professional and practical skills:</u>

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

c1. Construct different building structural elements in the load bearing system: foundations, walls, jack arch floors, vaults, and domes.
c2. Protect different building elements against some of the surrounding threats such as: storm water, ground water, and the thermal effect of the sun rays.

c3. Use freehand sketches and engineering drafting to draw building construction details.
c4. Build physical abstracted models to illustrate some constructional problems solutions.

d- General and transferable skills:

By the end of this course the student should demonstrate fair ability to:

d1. Do simple Search for information.
d2. Manage time to meet deadlines.
d3. Refer to relevant literatures.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

Topic	Lecture	Tutorial	Total
Introduction	2 hrs.	2 hrs.	4 hrs.
Terms & Structure Systems; traditional & conventional	2 hrs.	2 hrs.	4 hrs.
English & Flemish Bonds	2 hrs.	2 hrs.	4 hrs.
Foundations and Ground Floor.	4 hrs.	4 hrs.	8 hrs.
Basement Floor and English court	4 hrs.	4 hrs.	8 hrs.
Intermediate Floor: (Jack Arch)	2 hrs.	2 hrs.	4 hrs.
Final Roof : (R.C. Slap)	2 hrs.	2 hrs.	4 hrs.
Final Roof: Domes on Pendentives & on Squenches	4 hrs.	4 hrs.	8 hrs.
Final Roof: Vaults	2 hrs.	2 hrs.	4 hrs.
Skeleton System	6 hrs.	6 hrs.	12 hrs.
TOTAL	30 hrs.	30 hrs.	60 hrs.

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%
- Year work:
  - In Class Quizzes 10%
  - Assignments/Studio work 40%
  - Participation 10%

9- List of references:

1. Text Book:
   Minke, Gernot. **Building With Earth**, Birkhaeuser, Germany.3rd. Ed.
2. Students Lecture Notes
3. Handouts
4. Recommended Readings:
   a) Ching, Francis D. K.; Building Construction Illustration, Wiley, 4th Ed.
   b) Mckay's, W. B. et al; Building Construction, v. I
   c) Ramsey, Sleeper; Architectural graphic standards, American Institute of Architects and Dennis J. Hall

d) Mitchell, George A.; Building Construction. v. I

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer
- Data show for presentations
- Internet connection
- Architectural Library

Course coordinator: **Associate. Prof. Dr. Sahar Morsi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs														
		A01	**A06**	**A12**	**A13**	**B03**	**B05**	**B11**	**C03**	**C05**	**C07**	**C11**	**C13**	**D05**	**D08**	**D11**
Course ILOs	**a1.**		●													
	a2.	●														
	a3.			●												
	a4.			●												
	a5.		●													
	a6.				●											
	b1.							●								
	b2.					●										
	b3.						●									
	c1.												●			
	c2.											●				
	c3.								●	●						
	c4.										●					
	d1.														●	
	d2.													●		
	d3.															●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3
Introduction				●		●	●	●								
Terms & Structure Systems		●		●	●	●	●	●				●		●	●	●
English & Flemish Bonds				●	●	●			●	●		●	●	●	●	●
Foundations and Ground Floor.	●		●			●	●		●	●	●	●	●	●	●	●
Basement Floor & English court	●	●	●			●			●	●	●	●	●	●	●	●
Intermediate Floor: (Jack Arch)		●				●	●		●	●		●	●	●	●	●
Final Roof : (R.C. Slap)		●	●			●	●		●	●	●	●		●	●	●
Final Roof: Domes		●				●	●		●	●		●		●	●	●
Final Roof: Vaults		●				●	●		●	●		●		●	●	●
Skeleton System	●	●	●			●	●	●	●		●	●		●	●	●

Table [3]: Learning Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3
Lecture	●	●	●	●	●	●	●	●	●	●	●					
Physical Maquette					●			●		●	●		●		●	
Report												●		●		●
Class Work	●	●	●	●	●	●	●	●	●	●	●	●			●	

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3
Assignment	●	●	●	●	●	●	●	●	●	●	●	●			●	
Physical Maquette					●					●	●		●		●	
Report												●		●		●
Exam(s)	●	●	●	●	●	●	●	●	●	●	●	●			●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 242: Building Construction and Materials (2)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two – 4th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Building Construction and Materials (2) **Code: ARC 242**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite:
ARC 241: Building Construction and Materials (1)

B- Professional Information

1- Catalog Course Description:

Conventional Construction Method; Skeleton system. Using Reinforced Concrete to construct structural elements. Staircases rules and design. Retaining walls; concrete and masonry. Arches & Lintels, Doors and Windows.

2- Overall aims of the course:

The aims of this course are to:

- Build the students awareness regarding:
  - Stairs design rules and construction methods
  - Some Arabic site jargon terms.
- Train the student to:
  - Draw some architectural details.
  - Propose solutions for some basic constructional needs such as connecting or retaining different levels, bridging wall openings, and adding doors and windows.

3- Intended Learning Outcomes (ILOs)

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic applied and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques.

A13 Demonstrate knowledge and understanding of site jargon, technical language and report writing styles and rules.

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions

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

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

C05 Prepare and present technical reports, working drawings, and construction documents for design projects.

C11 Apply quality assurance procedures and follow codes and standards.

C13 Use appropriate construction techniques and materials to specify and implement different designs.

D05 Manage tasks and resources

D11 Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define active and passive loads that act on retaining walls.
a2. Define the structural theory that is applied in different retaining walls design.
a3. List different types of wooden doors according to the manufacturing method.
a4. Define the different structural concepts that are used to construct the RC stairs.
a5. List different site jargon terms that are related to arch construction.

b- Intellectual skills:

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

b1. Select proper lintel type according to opening span, offering and limitations.
b2. Apply structural rule of thumb to design (schematically) retaining walls.
b3. Select proper retaining wall type according to retained height.

c- Professional and practical skills:

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

c1. Apply retaining walls _safely_ to retain levels differences.
c2. Apply arches and different lintels _according to their constructional material_ to bridge wall openings.
c3. Draw detailed engineering drawings to execute building elements such as arches, lintels, wooden doors, stairs, and retaining walls.

d- General and transferable skills:

By the end of this course the student should demonstrate fair ability to:

d1. Manage time to meet deadlines.
d2. Refer to relevant literatures.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

Topic	Lecture	Tutorial	Total
Introduction: main conventional construction systems	2 hrs.	2 hrs.	4 hrs.
Retaining Walls: Massive & Cantilever RC walls	4 hrs.	4 hrs.	8 hrs.
Lintels & Arches	4 hrs.	4 hrs.	8 hrs.
Stairs: U-Shaped staircase design	4 hrs.	4 hrs.	8 hrs.
Stairs: Circular stairs Design	4 hrs.	4 hrs.	8 hrs.
Stairs: Stones and RC stairs: Construction	6 hrs.	6 hrs.	12 hrs.
Doors and Windows	6 hrs.	6 hrs.	12 hrs.
TOTAL	30 hrs.	30 hrs.	60 hrs.

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%
- Year work:
  - In Class Quizzes 10%
  - Assignments/Studio work 40%
  - Participation 10%

9- List of references:

1. Text Book:
   Chudley, Roy & Greeno, Roger
   Building Construction Handbook, 10th Ed.
2. Students Lecture Notes
3. Handouts
4. Recommended Readings:
   a) Ching, Francis D. K.; Building Construction Illustration, Wiley, 4th Ed.
   b) Mckay's, W. B. et al; Building Construction, v. I
   c) Ramsey, Sleeper; Architectural graphic standards, American Institute of Architects and Dennis J. Hall
   d) Mitchell, George A.; Building Construction. v. I

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer
- Data show for presentations
- Internet connection
- Architectural Library

Course coordinator: **Associate. Prof. Dr. Sahar Morsi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs											
		A01	A06	A13	B03	B05	B11	C03	C05	C11	C13	D05	D11
Course ILOs	a1.	●											
	a2.	●											
	a3.		●										
	a4.		●										
	a5.			●									
	b1.				●								
	b2.					●							
	b3.						●						
	c1.									●			
	c2.										●		
	c3.							●	●				
	d1.											●	
	d2.												●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	b1	b2	b3	c1	c2	c3	d1	d2
Introduction	●										●		
Retaining Walls	●	●					●	●	●		●	●	●
Lintels & Arches					●	●				●	●	●	●
Stairs				●							●	●	●
Doors and Windows			●								●	●	●

Table [3]: Learning Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	b1	b2	b3	c1	c2	c3	d1	d2
Lecture	●	●	●	●	●	●	●	●	●	●			
Self-study	●	●			●			●					●
Class Work					●	●	●	●	●	●	●	●	

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	b1	b2	b3	c1	c2	c3	d1	d2
Assignment			●	●	●	●	●	●	●	●	●	●	
Quiz	●	●			●							●	●
Exam(s)	●	●	●	●		●	●	●	●	●	●	●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 311: Architectural Design (3)
"*Site Consideration*"

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic level/Semester:	Level Three –5th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Architectural Design (3) **Code: ARC 311**
Credit Hours: **4 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **6 Hrs.**
Total: **8 Hrs.**
Prerequisite: ARC 212: Architectural Design (2)

B- Professional Information

1- Catalog Course Description:

The main concern and focus of this course will be about the "Environmental/Site Considerations" affecting the design decisions. The course will address urban projects to introduce urban spaces and landscape design. The course will also emphasize the importance of the setting: environmental and physical factors in the design process, introduction and experimentation with current trends and concepts through studio and design assignments. Course projects may be such as: Hostel, Youth Camp, Touristic Village, Gated Residential Communities, and other similar ones.

2- Overall aims of the course:

The main aims of this course are to:

1. Enhance student's awareness of creative design process within a set of moderate site limitations.
2. Train student to evaluate and compare between different solutions.
3. Encourage student to spell out thoughts and ideas.

3- Intended learning outcomes of course (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.

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions

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

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems

C15 Display imagination and creativity.

C16 Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect

C19 Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community

D01 Communicate effectively

D02 Discuss and defend ideas

D05 Manage tasks and resources

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

D09 Work under stressful environments and within constraints of time and budget

D11 Refer to relevant literatures

3.2. Intended learning outcomes of course (ILOs):

a- <u>Knowledge and understanding:</u>

By Completing this course successfully the student should be able to:

a1. Explain architectural design and planning as process and product.

a2. Analyze climatic considerations and natural environment in design

a3. Recognize design problems, reporting clients' needs & requirements.

a4. Gather relevant information.

b- Intellectual skills:

By Completing this course successfully the student should be able to:

b1. Critically Analyze different case studies and design alternatives achieving results.

b2. Develop solution of an architectural problem incorporating different user and site considerations

b3. Develop forms in two and three dimensions engaging images of places and time with innovation and creativity.

b4. Develop project alternatives and evaluate their expected performance.

b5.Consider appropriate materials, structural systems and construction elements in the design process.

c- Professional and practical skills:

By Completing this course successfully the student should be able to:

c1. Use knowledge and understating of mathematics, science, art, information technology, design and engineering concepts to design and plan buildings and to solve problems.

c2. Develop drawings representing project using different expression techniques to visualize ideas verbally and graphically, either manually or digitally.

c3. Develop innovative and appropriate solutions for an architectural and urban problem.

c4. Encourage students to think creatively and imagine their projects

c5. Consider design alternative solutions, design changes, and differences in styles, opinions and evaluations based on others values, culture and experiences

c6. Develop a project for FUE community, a hostel for FUE students and staff.

d- General and transferable skills:

By Completing this course successfully the student should be able to:

d1. Present information effectively.

d2. Communicate ideas commendably.

d3. Manage design and presentation tasks.

d4. Review literature and information.

d5. Develop project according to schedule of requirements and submissions.

d6. Refer to relevant literature.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	**Introduction**	8	-	8
2	**Develop awareness of site considerations and urban design needs as applied to medium scale projects**	8	18	26
3	**Express ideas with self-confidence and manage teamwork**	6	6	12
4	**Enhance design process practice**	-	10	10
5	**Organize and articulate form and urban space that satisfy functional, environmental, and aesthetic requirements**	4	22	26
6	**Establish design and evaluation criteria**	4	18	22
7	**Test different design alternatives**	-	8	8
8	**Decide upon the most satisfying solution**	-	8	8
Total		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

- Year's work: 30%
- Submission of Final Project 20 %
- Final exam: 40%
- Participation 10 %

9. List of references:

1. **Text Book:**
   James A. LaGro Jr., **Site Analysis: A Contextual Approach to Sustainable Land Planning and Site Design**, 2007
2. **Recommended Readings:**

- Ramsey, C.; Ray, J. & Hoke, Jr.:
  Architectural Graphic Standards, Tenth Edition - metric, AIA. John Wiley & Sons Inc., 2000, NJ. USA
- Chiara, J.:
  Time Saver Standards for Architectural Design,
  Most recent metric version
- Francis D.K. Ching:
  Architecture: Form, Space and Order.
- Architectural Magazines and Projects
- Periodicals & Web sites:
  - Architecture
  - Architectural Record
  - Architectural Review
  - Architecture d'aujourdhui
  - www.architecturalrecord.com
  - www.greatbuildings.com

10. Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data show for presentations
- Architectural Library
- Internet Connection

Course coordinator: **Prof. Dr. Samir Sadek Hosny**
Head of Department: **Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

Course ILOs	Program ILOs: A03	A07	A10	B02	B03	B04	B05	B11	C01	C03	C14	C15	C16	C19	D01	D02	D05	D08	D09	D11
a1.	●																			
a2.		●																		
a3.			●																	
a4.			●																	
b1.				●																
b2.					●															
b3.						●														
b4.							●													
b5.								●												
c1.									●											
c2.										●										
c3.											●									
c4.												●								
c5.													●							
c6.														●						
d1.															●					
d2.																●				
d3.																	●			
d4.																		●		
d5.																			●	
d6.																				●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	c6	d1	d2	d3	d4	d5	d6
Topic #2		●		●	●	●									●				●		
Topic #3	●												●			●	●	●		●	
Topic #4									●												●
Topic #5							●	●		●	●	●									
Topic #6			●					●													
Topic #7						●		●						●							
Topic #8					●																

Table [3]: learning/teaching Method/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	c6	d1	d2	d3	d4	d5	d6
Lecture		●																			
Project	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Physical Model						●	●			●											
Research	●		●		●											●			●		●
Group Discussion	●				●	●		●	●			●				●	●				

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	c6	d1	d2	d3	d4	d5	d6
Project	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Exam	●	●	●			●	●		●	●	●	●	●	●				●		●	
Discussions														●		●	●				

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 312: Architectural Design (4)
"*Structure as a Form Generator*"

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Three – 6th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Architectural Design (4) **Code: ARC 312**

Credit Hours: **4 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **6 Hrs.**
Total: **8 Hrs.**

Prerequisite: ARC 311: Architectural Design (3)

B- Professional Information

1- Catalog Course Description:

The main concern and focus of this course will be about the different methods of "Form Generation". The priority will be for using advanced structure systems as the main tool to generate advanced and sophisticated forms. The course concerns the development of the students' sense of structure to generate architectural concepts and forms. The course projects may be such as: Design Center, Club House, Religious Complex, Rest House, Bus/railway Station, Indoor Sports Hall, and other similar ones.

2- Overall aims of the course:

The main aims of this course are to:

1. Enhance student's awareness of creative design process within a set of moderate structural needs, limitations and offerings.
2. Train student to use structure system as a form generator.
3. Encourage student to spell out thoughts and ideas.

3- Intended learning outcomes of course (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

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information

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- <u>Knowledge and understanding:</u>

Upon successful completion of the course, the student should be able to:

a1. Define the theoretical bases upon which moderate scale structures and recreational accommodation buildings are designed.

a2. Explain the relations between design problem variables and inputs in the case of moderate scale structures and recreational accommodation buildings.

a3. Define the principles of building technologies, including the application of structures, construction methods, and materials in relation to human needs related to moderate scale structures and recreational accommodation buildings.

a4. Explain the environmental aspects that affect the project quality in the case of moderate scale structures and recreational accommodation buildings.

B- <u>Intellectual skills:</u>

Upon successful completion of the course, the student should be able to:

b1. Use analytical thinking methods to define complex design problems.

b2. Use creative thinking methods to propose different matured and enhanced design alternatives.

b3. Evaluate design alternatives professionally.

b4. Deduce the detailed requirements and architectural project program in the case of recreational accommodation buildings, according to the user behavior, site limitations, availabilities and function needs.
b5. Generate design concepts based on the structure system as a form generator.

C- Professional and practical skills:

Upon successful completion of the course, the student should be able to:

c1. Express creative and innovative solutions of the design problem..
c2. Design recreational accommodation buildings in light of integrating social, aesthetic and technical requirements.
c3. Use proper presentation techniques to represent his/her final design proposal.

D- General and transferable skills:

Upon successful completion of the course, the student should be able to:

d.1. Express his/her ideas by visual, graphic, written and verbal means
d.2. Search for relevant information.
d.3. Manage time and meet deadlines

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Data collection and data review	6	9	20
2	Data Analysis	6	9	20
3	Site analysis and Concept	9	15	20
4	Form and Composition	9	15	20
5	Follow up	-	18	20
6	Project finishing & final submission	-	24	20
Total		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%
- Year's work:
  - In Class Quizzes 10%
  - Assignments/Studio work 40%
  - Participation 10%

9- List of references:

1- Text Book:

- Charleson; Andrew, **Structure As Architecture: A Source Book for Architects and Structural Engineers** 2nd Edition, 2014

2- Recommended Readings:

3- Ramsey, C.; Ray, J. & Hoke, Jr.
Architectural Graphic Standards/Tenth Edition, AIA. John Wiley & Sons Inc., 2000, NJ. USA /AIA. John Wiley & Sons Inc.

- Chiara, J.:
  Time Saver Standards for Architectural Design, Most recent metric version
- Francis D.K. Ching:
  Architecture: Form, Space and Order.
- Architectural Magazines and Projects
- Periodicals & Web sites:
  - Architecture
  - Architectural Record
  - Architectural Review
  - Architecture d'aujourdhui
  - www.architecturalrecord.com
  - www.greatbuildings.com

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data show for presentations
- Architectural Library
- 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	A10	B02	B03	B04	B11	C01	C03	C15	D02	D05	D08
Course ILOs	a1.	●												
	a2.			●										
	a3.		●											
	a4.		●											
	b1.				●									
	b2.						●							
	b3.					●								
	b4.					●								
	b5.							●						
	c1.										●			
	c2.								●					
	c3.									●				
	d1.											●		
	d2.													●
	d3.												●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2	d3
Projects data collection, site visits and data review	●	●	●					●		●		●	●	●	●
Data Analysis	●	●	●	●	●	●		●	●	●		●	●	●	●
Site analysis and Design Concept	●	●	●	●	●	●	●	●		●	●	●	●		●
Form and Mass generation	●		●	●	●	●	●		●	●	●		●		●
Development and follow up	●			●			●		●	●	●		●		●
Final presentation, finishing and representation of researches									●	●	●	●	●		●

Table [3]: Teaching Method/ILO Matrix

Teaching Method	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2	d3
Lecture	●	●	●	●	●	●	●	●	●						
Research		●	●	●	●	●	●	●	●	●		●	●	●	●
Sketch Designs		●	●	●	●	●	●	●	●	●	●	●	●		●
Group Discussion					●	●	●	●	●				●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2	d3
Research and data collection	●	●	●	●			●	●	●	●		●	●	●	●
Oral presentations					●		●		●				●	●	●
Sketch Designs		●	●	●	●	●	●	●	●	●	●	●	●		●
Final Written exam	●	●	●	●	●	●			●	●	●	●	●		●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 321: History & Theories of Architecture 3

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Three – 6th semester
Date of specification approval:	November 2017

A- Basic Information

Title: History & Theories of Architecture 3 **Code: ARC 321**

Credit Hours: **2 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **0 Hrs.**
Total: **2 Hrs.**
Prerequisite: ARC 221: History & Theories of Architecture 1

B- Professional Information

1- Catalog Course Description:

The study deals with different topics like history of each period, geology & climate, materials, construction systems, architectural character, Islamic decorations and analysis for examples. The periods are: Romanesque - Gothic - Fustat - Al Askar - Al Qatta'i - Fatimid Cairo - Ayyubid - Mamluk - Ottoman.

2- Overall aims of the course:

The main aim of this course is to build the student's knowledge of the architectural styles and theories of the era of Islamic civilization.

3. Intended learning outcomes (ILOs):

3.1. Program ILOs related to course:

A04 Demonstrate knowledge and understanding of history of architecture, and regional planning across different eras

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

B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.

B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.

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

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. Explain the famous and great buildings of the mentioned periods.
a.2. Explain the Ancient civilizations of the mentioned periods.
a.3. Explain the development of the historical architecture

b- Intellectual skills:

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

b.1. Deduce the effective factor elements for different historical architectures.
b.2. Analyze the relationship between civilization and architecture.

c- Professional and practical skills:

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

c.1. Sketch some elements of the styles of the historical Architecture.

d- General and transferable skills:

N/A

3- Course ILOs versus Program ILOs relation

See table [1]

4- ILOs Teaching & Assessment Method

See Appendix (1)

5- Course Contents:

Week	Topics	Hours
1	Romanesque	2
2	Gothic	2
3	Fustat	2
4	Al Askar	2
5	Al Qatta'i	2
6&7&8	Fatimid Cairo	6
9	Ayyubid	2
10-13	Mamluk	8
14&15	Ottoman	4
Total		30

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%
- Year work:
  - In Class Quizzes 20%
  - Assignments 30%
  - Participation 10%

9- List of references:

1- Text Book:

Tawfik Abdel Gawad – ***"History of Islamic Architecture"*** – Part 2

2- References:

Yahya Waziri "***Encyclopedia of elements of Islamic architecture***" 1999.

10- Facilities required for teaching and learning:

- Lecture Room
- White board
- Computer & data show for presentations
- Internet connection.
- Architectural Library

Course coordinator: **Prof. Dr. Yousef El Rafie**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs				
		A 04	A 09	B 13	B 15	C03
Course ILOs	a1.	●				
	a2.	●				
	a3.		●			
	b1.				●	
	b2.			●		
	c1.					●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	b1	b2	c1
Ancient Egyptian Architecture	●	●	●	●	●	●
Mesopotamian	●	●	●	●	●	●
Greek	●	●	●	●	●	●
Roman	●	●	●	●	●	●
Early Christian	●	●	●	●	●	●
Byzantine	●	●	●	●	●	●
Renaissance	●	●	●	●	●	●
Baraque	●	●	●	●	●	●
Rococo	●	●	●	●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	b1	b2	c1
Lecture	●	●	●	●	●	●
Assignment	●			●	●	●
Participation					●	

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	b1	b2	c1
Assignment	●			●	●	●
In class Quiz			●	●	●	●
Final Exam	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 322: History & Theories of Architecture (4)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Three – 5th semester
Date of specification approval:	November 2017

A- Basic Information

Title: History & Theories of Architecture (4) **Code: ARC 322**
Credit Hours: **2Cr. Hrs.**
Lectures: **2 Hrs.**
Total: **2 Hrs.**
Prerequisite: ARC 222: History & Theories of Architecture (2)

B- Professional Information

1- Catalog Course Description:

Building Types; Designing community facilities, Educational, Cultural, Health, Recreational, Commercial, Administrative and Tourist buildings.

2- Overall aims of the course:

The main aims of the course are to:

- Build the student's knowledge regarding:
  a. The components and the steps of proposing a design program.
  b. Theories related to designing community facilities buildings.
  c. The design guidelines of selected types of buildings.
- Train the student to
  a. Classify and analyze constrains that manage the design of a certain kind of buildings.
  b. Analyze a wide range of examples of international buildings that represent the theories taught.

3- Intended learning outcomes of course (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.

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

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information.

B07 Incorporate different dimensions of economy, society, environment, technology applicability, safety, site constraints, urban context and risk management in design

B10 Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.

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

D01 Communicate effectively.

D02 Discuss and defend ideas.

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

D11 Refer to relevant literatures

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a.1. Define the phases of the architectural design process.
a.2. Explain the environmental and human factors affecting the architectural decisions.
a.3. Define design problems.

b- Intellectual skills:

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

b.1. Inspect social and environmental dimensions affecting the design decisions.
b.2. Interpret project's objectives to reach optimum solution.

c- Professional and practical skills:

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

c.1. Use conceptual sketches to visualize ideas.

d- General and transferable skills:

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

d.1. Present ideas effectively.
d.2. Defend ideas.
d.3. Review literature and information.
d.4. Cite relevant literature.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Introduction	2	-	2
2	History of Theory	4	-	4
3	Theory in Relation to Method	4	-	4
4	Synthesis of the design concept	4	-	4
5	Architectural design program; components and steps	4	-	4
6	Methods of Evaluation and Design Development	2	-	2
7	Schools design principles and guidelines	4	-	4
8	Hotels design principles and guidelines	2	-	2
9	Presentations	4	-	4
Total		30	-	30

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- Assessment

- Final exam: 40%
- Year work:
  - In Class Quizzes 30%
  - Assignments & research 20%
  - Participation 10%

8- List of references:

1. **Text Book:**
   Joseph De Chiara and Mike Crosbie, **Time-Saver Standards for Building Types,** 2001.
2. **Students Notes.**
3. **Handouts**
4. **Recommended Readings:**
   a) Julius Panero, Time-Saver Standards for Interior Design and Space Planning, 2nd Ed, McGraw Hill..
   b) Walter A. Rutes et ell; Hotel Design, Planning and Development. W.W. Norton & Company, 2001.
   c) Parkash Nair et ell; The Language of School Design. Designshare Inc. 2009.
   d) Richard L. Miller; Hospital and Healthcare Facility Design. W.W. Norton & Company, 2012

9- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data Show for Presentations + Internet Connection.
- Architectural Library

Course coordinator: **Prof. Dr. Osama Elrawi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

Course ILOs	Program ILOs									
	A03	A09	A10	B07	B10	C03	D01	D02	D08	D11
a1	●									
a2		●								
a3			●							
b1				●						
b2					●					
c1						●				
d1							●			
d2								●		
d3									●	
d4										●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	b1	b2	c1	d1	d2	d3	d4
Introduction	●	●	●							
History of Theory	●	●	●							
Theory in Relation to Method		●		●	●					
Synthesis of the design concept				●	●					
Architectural design program; components and steps	●	●	●	●	●	●				
Methods of Evaluation and Design Development		●		●	●	●			●	●
Building types design principles and guidelines			●		●				●	●
Presentations						●	●	●	●	●

Table [3]: Teaching Method/ILO Matrix

Teaching Method	a1	a2	a3	b1	b2	c1	d1	d2	d3	d4
Lecture	●	●	●	●	●					
Presentation						●			●	●
Assignment						●	●	●		

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	b1	b2	c1	d1	d2	d3	d4
Assignments		●				●			●	●
Presentation		●				●	●	●		
Exams	●		●	●	●	●				

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 323 : Human Studies in Architecture

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic Level / semester:	Level three – 5th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Human Studies in Architecture **Code: ARC 323**

Credit Hours:	**2 Cr. Hrs.**
Lectures:	**2 Hrs.**
Tutorial:	**0 Hrs.**
Total:	**4 Hrs.**
Prerequisite:	**----------**

B- Professional Information

1- Catalog Course Description:

The course looks at architecture within the framework of human sciences. The history of human sciences in architecture, Human theories and society formation, Environment relationship, Perception, behavior and culture, Behavior and the built environment, Human needs in relation to social concepts, Humanities in contemporary architecture, Sampling, data gathering and social research tools, Applied behavioral research.

2- Overall aims of the course:

The main aims of the course are to build the student's knowledge regarding:

- The role of humanities in Architecture and Planning.
- The mutual effects between human behavior and built environment which in turn have an impact on Architectural and Urban Design.
- The student's perception of both indoor and outdoor spaces depending on the behavioral and psychological factors, and hence supporting decision-making process.

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.
A09.Demonstrate understanding and appreciation to the social, environmental, ethical and economic considerations and human factors affecting the exercise of the architectural decisions
A10. Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information
A14.Demonstrate knowledge and understanding of contemporary engineering topics
B07.Incorporate different dimensions of economy, society, environment, technology applicability, safety, site constraints, urban context and risk management in design
B12 Integrate community design parameters into design projects.
B13. Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.
B15. Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.
D08. Search for information and adopt life-long self-learning
D11. Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

By the end of the course successfully the student should be able to:
a1. Differentiate between Human Sciences and Natural Sciences.
a2. Define Environmental Psychology as a relevant discipline.
a3. List the physical common traits in human perception.
a4. Outline the common psychological structures and responses.
a5. Explain individual differences and preferences.
a6. State the difference between the concepts of space and place.
a7. List people's psychological needs in open spaces.
a8. Define space ideality and the narrative concept.

b- Intellectual skills:

By the end of this course the student should be able to:
b1. Relate the discussed concepts with other relevant concepts.
b2. Apply concepts on existing projects.

c- Professional and practical skills:

Not Applicable

d- General and transferable skills:

By the end of this course the student should be able to:
d1. Search for data effectively

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

Topic	Lecture
Introduction	2 hrs.
The Multisensory Nature of Perception	2 hrs.
Symbolism and Aesthetic Response	6 hrs.
Familiarity versus Aesthetics	6 hrs.
Attributes of Residential Environments	6 hrs.
Functional Categories and Basic Human Requirements	6 hrs.
The Logic of Space	2 hrs.
TOTAL	30 hrs.

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%
- semester work:
  - Reports 10%
  - Assignments/submissions 40%
  - Participation 10%

9- List of references:

- **Textbook:**

  Applications of Environment-Behavior Research: Case Studies and Analysis (Environment and Behavior), Cambridge University Press 1993.
- **Handouts:**
  - Chermayeff, Serge. (1965), Community and Privacy. Anchor Books, USA.
  - Sanoff, Henry. (1991) Visual Research Methods in Design, Van Nostrand Reinhold, USA.
  - Smith, Peter. (1979). Architecture and the Human Dimension, The Pitman Press, UK.
- **Recommended books**
  - Rapoport, Amos. (1977). Human Aspects of Urban Form, Pergamon Press, USA.
  - Hillier, Bill. (1988). The Social Logic of Space. Cambridge University Press, UK.

10- Facilities required for teaching and learning:

- Lecture Hall
- White board
- Computer & Data Show for Presentations + Internet Connection.
- Architectural Library
- Field trip services

Course coordinator: **Prof. Osama Al-Rawy**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs										
		A03	A09	A10	A14	B02	B07	B12	B13	B15	D08	D11
Course ILOs	a1.	●	●									
	a2.			●								
	a3.		●									
	a4.			●	●							
	a5.						●	●				
	a6								●	●		
	a7									●		
	a8							●	●	●		
	b1						●	●	●			
	b2								●			
	d1.										●	●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	d1
Introduction	●	●				●		●			
The Multisensory Nature of Perception			●								
Symbolism and Aesthetic Response				●							●
Familiarity versus Aesthetics					●				●		●
Attributes of Residential Environments										●	
Functional Categories and Basic Human Requirements						●				●	
The Logic of Space							●	●	●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	d1
Lecture	●	●	●	●	●	●	●	●			
Tutorial	●	●	●	●	●	●	●	●	●		
Group work									●	●	●
Seminar										●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	d1
Reports Individual or small Groups										●	●
Teamwork Research									●	●	●
Teamwork Project			●	●	●	●	●	●			●
Research Presentation									●	●	●
written exam : written exam at the end of semester	●	●	●	●	●	●	●	●	●	●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 341: Building Construction and Materials (3)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Three – 5th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Building Construction and Materials (3) **Code: ARC 341**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **4 Hrs.**
Total: **6 Hrs.**
Prerequisite: ARC 242: Building Construction and Materials (2)

B- Professional Information

1- Catalog Course Description:

The main concern and focus of this course will be about the advanced construction systems and execution methods. The course will cover the basics of designing and executing buildings with large span and high rise buildings; mainly the steel and wood trusses and frames. Also the course will comprise the design and execution details of space trusses, geodesic domes, tents, tension and shell structures.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Know the main types of advanced constructions with large spans and high rise structures.
- Know the theory of transferring loads in large spans and high rise structures.
- Know the different materials appropriate for executing large spans and high rise structures
- Draw different working details for large spans and high rise structures

3- Intended learning outcomes of course (ILOs):

3.1 . Program ILOs related to course:

A1 Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A6 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

A8 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline.

A13 Demonstrate knowledge and understanding of site jargon, technical language and report writing styles and rules.

A17 Demonstrate knowledge and understanding of the role of the architecture profession relative to the construction industry and the overlapping interests of organizations representing the built environment.

B3 Solve architectural problems often on the basis of limited and possibly contradicting information

B4 Explore and think of design forms in two and three dimensions engaging images of places and time with innovation and creativity.

B5 Derive different alternative solutions and assess their expected performance to reach architectural decisions.

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

C5 Prepare and present working drawings, and construction documents for design projects

C7 Build architectural physical and computer models.

C13 Use appropriate construction techniques and materials to specify and implement different designs;

D5 Manage tasks and resources

D8 Search for information and adopt life-long self-learning

D11 Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. List the main types of advanced constructions with large spans.
a2. List the main types of advanced constructions with high rise.
a3. Illustrate how life/dead loads are transferred through different structure systems with large span.
a4. Illustrate how life/dead loads are transferred through different structure systems with high rise.
a5. List different materials appropriate for executing large spans constructions.
a6. List different materials appropriate for executing high rise constructions.
a7. Identify different ways of modelling and presenting structure systems.

b- <u>Intellectual skills:</u>

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

b1. Differentiate between diverse types of large span structures considering optimum covered span and resulting form.
b2. Differentiate between diverse types of high rise structures considering resulting form and plan, also the maximum rise.

b3. Select proper structural system according to the building needs and function.
b4. Deduce the structure system that is used in a given complete project.

c- Professional and practical skills:

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

c1. Design appropriate structure system for various constructional cases that include large span or high rise structures.
c2. Use freehand sketches and engineering drafting to draw building construction details
c3. Design appropriate details for various constructional cases that include large span or high rise structures.
c4. Build architectural physical models for different construction ways for large spans and high rise constructions.

d- General and transferable skills:

By the end of this course the student should demonstrate fair ability to:

d1. Manage tasks and resources
d2. Search for information
d3. Refer to relevant literatures.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Introduction	2	4	6
2	Linear structures (vector-active): steel trusses	2	4	6
3	Linear structures (Section-active): steel frames	2	4	6
4	Wooden trusses and frames	2	4	6
5	space structures(Surface-active): steel space trusses	2	4	6
6	space structures(Surface-active): Geodesic Domes	2	4	6
7	space structures(Form-active): Cable structures	2	4	6
8	space structures(Form-active): Tent structures	2	4	6
9	Shell structures(Form-active): Folded Roofs	2	4	6
10	Shell structures(Form-active): shell structures , double curvature	2	4	6
11	Hybrid Structures	2	4	6
12	High rise buildings systems	-	4	4
13	High rise buildings systems	-	4	4
14	High rise buildings systems	-	4	4
15	Revision	6	-	6
Total		30	60	90

6- learning/teaching methods:

See Appendix, table [3]

7- ILOs Teaching & Assessment Method

See Appendix, table [4]

8- Weighting of assessments

- Final exam: 40%
- Year's work:
  - In Class Quizzes 10%
  - Self-study……. 10%
  - Assignments/Studio work.....30%
  - Participation.....10%

9- List of references:

1. Text Book:

Angel, Heino, Structural Systems, Hatje Cantz; 3 edition (February 1, 2007)

2. Handouts
3. Recommended Readings:
   a) Ching, Francis D. K.; Building Construction Illustration, Willey4th Ed.
   b) Mckay's, W. B. et ell; Building Construction, v. I
   c) Ramsey, Sleeper; Architectural graphic standards, American Institute of Architects and Dennis J. Hall
   d) Mitchell, George A.; Building Construction. V. I

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Data show for presentations
- Architectural Library

Course coordinator: **Associate. Prof. Dr. Sahar Morsi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program's Intended learning outcomes served by course :															
		A1	A6	A8	A12	A13	A17	B3	B4	B5	B11	C5	C7	C13	D5	D8	D11
Course's Intended learning outcomes (ILOs):	a1		●			●	●										
	a2		●			●	●										
	a3	●															
	a4	●															
	a5				●												
	a6				●												
	a7			●													
	b1							●	●	●							
	b2							●	●	●							
	b3										●						
	b4							●									
	c1											●					
	c2											●					
	c3													●			
	c4												●	●			
	d1														●		
	d2															●	
	d3																●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3
Introduction	●	●					●									●	●
Linear structures (vector-active): steel trusses			●		●			●		●	●	●	●				●
Linear structures (Section-active): steel frames			●		●			●		●	●	●	●				●
Wooden trusses and frames			●		●			●		●	●	●	●				●
space structures(Surface-active): steel space trusses			●		●			●		●	●	●	●				●
space structures(Surface-active): Geodesic Domes			●		●			●		●	●	●	●	●			●
space structures(Form-active): Cable structures			●		●			●		●	●	●	●	●			●
space structures(Form-active): Tent structures			●		●			●		●	●	●	●	●			●
Shell structures(Form-active): Folded Roofs			●		●			●		●	●	●	●	●			●
Shell structures(Form-active): shell structures , double curvature			●		●			●		●	●	●	●	●			●
Hybrid Structures			●		●			●		●	●	●	●	●			●
High rise buildings' systems		●		●		●	●		●		●	●	●	●	●	●	●
revision	●									●							

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3
Lecture	●		●		●		●						●				
Research (self-study)		●		●		●			●		●		●	●	●	●	●
Class Work								●		●	●	●	●	●			

Table [4]: Assessment Method/ILO Matrix																	
Assessment Method	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3
Assignment								●	●		●	●	●	●			
Research								●					●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●	●	●				

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 342: Building Construction and Materials (4)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Three – 6th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Building Construction and Materials (4) **Code: ARC 342**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **4 Hrs.**
Total: **6 Hrs.**

Prerequisite: ARC 341: Building Construction and Materials (3)

B- Professional Information

1- Catalog Course Description:

Contemporary finishing techniques, methods, Architectural /building works, Partitions, curtain walls, Panels, Finishing materials, bricks, timber, metals, plastics and synthetics, Plaster, cladding, suspended ceilings, raised floor…,etc.) Expansion and settlement joints, admixtures, thermal and damp proofing.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Know the different ways of Thermal and damp proofing.
- Know the main types of expansion and settlement joints.
- Know the different types of flooring, wall and ceiling finishes.
- Recognize the different technics of executing floor, wall and ceiling finishes.

3- Intended learning outcomes of course (ILOs):

Program ILOs related to course:

3.1 **A01** Demonstrate knowledge and understanding of concepts and theories of basic applied and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques.

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline

A13 Demonstrate knowledge and understanding of site jargon, technical language and report writing styles and rules

A17 Demonstrate knowledge and understanding of the role of the architecture profession relative to the construction industry and the overlapping interests of organizations representing the built environment

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions

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

C05 Prepare and present technical reports, working drawings, and construction documents for design projects

C13 Use appropriate construction techniques and materials to specify and implement different designs;

D05 Manage tasks and resources

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

D11 Refer to relevant literatures

3.2 Intended learning outcomes of course (ILOs):

a- Knowledge and understanding:

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

a1. Define the need for building insulation and joints.
a2. List the different ways of and water, damp thermal proofing.
a3. Define the main types of expansion and settlement joints.
a4. List the different types of floor, wall and ceiling finishes.
a5. Recognize the different types of executing floor, wall and ceiling finishes.

a- Intellectual skills:

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

b1. Differentiate between the different types of thermal and damp proofing.
b2. Differentiate between the different types of Expansion and settlement joints.
b3. Weight the importance of building finishes.
b4. Appraise the characteristics of different building materials
b5. Select best finishing materials and fixation technics for floor, wall, ceiling and facades.

a- Professional and practical skills:

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

c1. Draw details with appropriate materials for various interior and exterior finishing cases.
c2. Draw details of deferent building's parts with thermal and damp proof
c3. Draw details for Expansion and settlement joints.
c4. Draw details to solve problem considering the use of different finishing materials side by side.

a- General and transferable skills:

E- By the end of this course the student should demonstrate fair ability to:

d1. Manage tasks and resources
d2. Search for information
d3. Refer to relevant literatures

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Introduction and overview	**2**	**4**	**6**
2	Water and damp proofing	2	4	6
3	Thermal proofing	2	4	6
4	Expansion and settlement joints	2	4	6
5	Research submission	-	6	6
6	Floor Finishes: Marble/ Granite	2	4	6
7	Floor Finishes: Wooden / Ceramic / Tiles	2	4	6
8	Floor Finishes: Raised floor	2	4	6
9	Introduction to wall Finishes: Partitions / Plaster work/ wall paper	2	4	6
10	Wall Finishes: Cladding / Partitions	2	4	6
11	Wall Finishes: Curtain walls	2	4	6
12	Introduction to Celling Finishes: Ceiling finishes, Plaster work/ Suspended & False Ceiling/ Metal lath	2	4	6
13	Ceiling finishes: Aluminum Strips / Gypsum Tiles / Gypsum Boards / Acoustic Tiles	2	4	6
14	Ceiling finishes: Aluminum Strips / Gypsum Tiles / Gypsum Boards / Acoustic Tiles	2	4	6
15	Revision	2	4	6
Total		30	60	90

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%
- Year work:
  - Mid-term exam 20%
  - Assignments/Studio work 30%
  - Participation 10%

9- List of references:

1. Text Book:
   Chudley, Roy & Greeno, Roger
   Building Construction Handbook, 10th Ed, Routledge, NY, 2014

2. محمد أحمد عبدالله، الرسومات التنفيذية والتفاصيل المعمارية، القاهرة، 2004.
3. Students Lecture Notes & Handouts
4. Recommended Readings:
   a) Ching, Francis D. K.; Building Construction Illustration, Wiley , 4th Ed.
   b) Mckay's, W. B. et ell; Building Construction, v. I
   c) Ramsey, Sleeper; Architectural graphic standards. American Institute of Architects and Dennis J. Hall
   d) Mitchell, George A.; Building Construction. v. I

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer
- Data show for presentations
- Internet connection
- Architectural Library

Course coordinator: **Associate. Prof. Dr. Sahar Morsi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs												
		A1	A6	A12	A13	A17	B03	B05	B11	C5	C13	D5	D8	D11
Course ILOs	a1.	●			●									
	a2.		●	●		●								
	a3.		●	●		●								
	a4.	●		●										
	a5.			●	●	●								
	b1.						●	●						
	b2.						●	●						
	b3.							●	●					
	b4.								●					
	b5.						●	●	●					
	c1.									●				
	c2.										●			
	c3.										●			
	c4.										●			
	d1.											●		
	d2.												●	
	d3.													●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2	d3
Introduction and overview	●							●									
Thermal and damp proofing		●				●						●					
Expansion and settlement joints			●				●						●				
Research submission & discussion				●	●				●	●	●				●	●	●
Floor Finishes: - Marble/ Granite				●	●			●	●	●	●						
Floor Finishes: - Wooden / Ceramic / Tiles					●				●	●	●						
Floor Finishes: - Raised floor					●				●	●	●			●			
Introduction to wall Finishes: Partitions / Plaster work/ wall paper				●	●			●	●	●	●			●			
Wall Finishes: - Cladding / Partitions					●				●	●	●			●			
Wall Finishes: Curtain walls					●				●	●	●			●			
Introduction to Ceiling finishes - Plaster work/ Suspended & False Ceiling/ Metal lath				●	●			●	●	●	●			●			
Ceiling finishes: - Aluminum Strips / Gypsum Tiles / Gypsum Boards / Acoustic Tiles					●				●	●	●			●			

Table [3]: Learning Method/ILO Matrix																	
Learning Method	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2	d3
Lecture	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Research				●	●				●	●	●			●	●	●	●
Class Work											●	●	●	●			

Table [4]: Assessment Method/ILO Matrix																	
Assessment Method	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2	d3
Assignment											●	●	●	●			
Research				●	●				●	●	●			●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●	●	●	●			

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 361: Environmental Control & Technical Installations (1)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programs:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two – 3rd semester
Date of specification approval:	November 2017

A- Basic Information

Title: Environmental Control and Technical Installation (1) **Code: ARC 361**

Credit Hours: **2 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **1Hrs.**
Total: **3 Hrs.**
Prerequisite: N/A

B- Professional Information

1- Catalog Course Description:

This course starts with the definition of the environment (natural and man-made) and its components. Then, it focuses on the "Room Acoustics". Many related topics will be introduced such as: nature of acoustics, weighted pressure levels, sound analysis, comfort and noise indices, acoustic design and noise control

In addition, the course addresses the main mechanical systems that are used in buildings to achieve vertical and horizontal circulation. Also, this course includes the hydraulic services that serve the user needs such as: water supply, sewerage, sewer and rainwater drainage, sanitary installations, firefighting, solid waste disposal.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Investigate, evaluate and optimize the sound performance of simple architectural spaces.
2. Suggest proper mechanical systems to enhance and fulfill the needs of a moderate complex building regarding vertical and horizontal circulation, firefighting, and sanitary services.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

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

A08 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions.

B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.

B07 Incorporate different dimensions of economy, society, environment, technology applicability, safety, site constraints, urban context and risk management in design.

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

C06 Use appropriate computer programs in engineering and architectural works

C17 Provide leadership and education to the client particularly with reference to sustainable design principles.

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

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define acoustics principles and theories.
a2. List some methods and techniques of sound control.
a3. List some digital software of acoustics analysis.
a4. Define the differences between one pipe, two pipes, and three pipes plumbing systems.
a5. List some techniques of firefighting systems.
a6. List some of vertical and horizontal circulation mechanical systems.

b- Intellectual skills:

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

b1. Analyze the impact of space shape and finishing of the acoustics performance.
b2. Choose the proper digital software of acoustics analysis.
b3. Choose the proper plumbing system of a building.
b4. Evaluate the results of the analytical studies and conclude with architectural solutions and design requirements.

c- Professional and practical skills:

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

c1. Design a plumbing system: cold and hot water supply, sewage, and storm water discharge, of a moderate complex building to achieve efficient resources usage.
c2. Apply digital software to analyze and evaluate the acoustics performance of a building.

d- General and transferable skills:

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

d1. Search for relevant information.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Contents:

#	Topic	Lec.	Tut.	Total
1	Acoustics: definitions and theories	4	2	6
2	Acoustics: design faults and problems	4	2	6
3	Acoustics: how to control and manipulate the space	4	2	6
4	Mechanical systems: horizontal circulation	4	2	6
5	Mechanical systems: vertical circulation	4	2	6
6	Plumbing systems	6	3	9
7	Firefighting systems	4	2	6
TOTAL		30	15	45

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%
- Year work: 50%
  - In Class Quizzes 10%
  - Assignments/Studio work 25%
  - Project 15%
- Performance & Participation 10%

9- List of references:

1. **Text Book:**

   Introduction to Architectural Science, The Basis of Sustainable Design

2. **Handouts**

3. **References/ Recommended Readings:**
   a. Sassi, Paola. Strategies for sustainable architecture. Taylor & Francis, 2006.
   b. Descottes, Hervé, and Cecilia E. Ramos.Architectural lighting: designing with light and space. Princeton Architectural Press, 2013.
   c. Bauer, Michael, Peter Mösle, and Michael Schwarz. Green building: guidebook for sustainable architecture. Springer Science & Business Media, 2009.
   d. International Plumbing Code
   e. NFPA
   f. SMACNA

10- Facilities required for teaching and learning:

- Lecture hall
- White board
- Computer & Data show for presentations
- Internet web connection
- Library
- Computer lab with preinstalled environmental control software such as Ecotect (student version).
- Environmental control field measuring tools such as Lux meter, Sound meter, Thermometer, and Anemometer.

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafar**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs										
		Topic										
		A06	A07	A08	B02	B05	B06	B07	C01	C06	C17	D08
Course ILOs	a1.		●									
	a2.		●									
	a3.			●								
	a4.	●										
	a5.	●										
	a6.	●										
	b1.				●							
	b2.						●					
	b3.					●						
	b4.							●				
	c1.								●		●	
	c2.									●		
	d1.											●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	d1
Acoustics: definitions and theories	●						●						●
Acoustics: design faults and problems		●	●				●	●				●	
Acoustics: how to control and manipulate the space		●	●				●	●				●	
Mechanical systems: horizontal circulation						●							●
Mechanical systems: vertical circulation						●				●			●
Plumbing systems					●				●	●	●		●
Firefighting systems				●						●			●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	d1
Lecture	●	●	●	●	●	●	●	●	●		●	●	
Research and Assignments	●	●	●	●	●	●	●	●	●	●	●	●	●
Project			●				●	●		●		●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	d1
Assignment		●	●	●	●	●	●	●	●	●	●	●	
Research	●	●	●				●	●				●	●
Midterm & Final Exam	●	●	●	●	●	●	●		●	●	●		

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 362: Environmental Control and Technical Installations (2)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two - 4th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Environmental Control and Technical Installations (2) Code: ARC 362

Credit Hours: 2 Cr. Hrs.
Lectures: 2 Hrs.
Tutorial: 1 Hrs.
Total: 3 Hrs.

Prerequisite: N/A

B- Professional Information

1- Catalog Course Description:

The course focuses on the building energy consumption and thermal performance. It addresses thermal comfort and how to achieve it using architectural and mechanical manipulations. Many related topics are investigated: Heat transfer, Storage and insulation, Air conditioning and ventilation, Heating and cooling loads, Central distribution and package units, Mechanical ventilation, Heating appliances and systems.

In addition, the course also addresses topics of architectural spaces lighting either naturally or artificially. Other related topics are also investigated: Daylight quality, Artificial lighting mechanism, Light sources and luminance design.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Investigate, evaluate and optimize the thermal performance of simple architectural spaces.
2. Investigate, evaluate and optimize the luminance performance of simple architectural spaces.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

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

A08 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions.

B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.

B07 Incorporate different dimensions of economy, society, environment, technology applicability, safety, site constraints, urban context and risk management in design.

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

C06 Use appropriate computer programs in engineering and architectural works

C08 Use special field devices.

C17 Provide leadership and education to the client particularly with reference to sustainable design principles.

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

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. Define some of the environmental and bioclimatic architectural fundamental principles.
a2. Define the term "comfort zone" and its criteria.
a3. List some technologies for creating comfortable indoor environments in case of thermal and lighting performance.
a4. List some programs that are used in environmental control simulation.
a5. List differences between various A/C systems.
a6. List differences between various artificial lighting systems.

b- <u>Intellectual skills:</u>

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

b1. Propose certain environmental manipulation process or concept to enhance a project design.
b2. Analyze the impacts of some environmental issues such as climatic conditions, thermal performance, and lighting performance on the building design.
b3. Calculate the cooling load for air conditioning.
b4. Choose the proper lux according to the space function.
b5. Evaluate the results of the analytical studies and conclude with architectural solutions and design requirements
b6. Choose the proper digital software of Luminal and thermal analysis.

c- Professional and practical skills:

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

c1. Apply architectural environmental control techniques or methods to enhance the design of a building according to climatic requirements.

c2. Apply digital software to analyze and evaluate the lighting and thermal behavior of the building.

c3. Apply field measuring tools to indicate the sound and lighting performance of architectural spaces.

d- General and transferable skills:

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

d.1. Search for relevant information.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Developing the relationship between human, building and natural environment through ages	2	1	3
2	Lighting and Daylighting-introduction	2	1	3
3	Lighting and Daylighting-Methods of Analyzing Daylighting	2	1	3
4	Lighting and Daylighting- Glare	2	1	3
5	Artificial Lighting systems	2	1	3
6	Thermal Comfort - Human Factors	2	1	3
7	Thermal Envelope-Glazing	2	1	3
8	Thermal Envelope-Ventilation	2	1	3
9	Thermal Envelope-Insulation	2	1	3
10	Passive Solar Heating and Cooling	2	1	3
11	Air conditioning systems	4	2	6
12	Cooling load calculations	2	1	3
13	Final project Discussion	4	2	6
Total		30	15	45

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%
- Year's work: 50%
  - First midterm : 15 %
  - Second midterm : 15 %
  - Assignments 20%
- Performance & Participation : 10 %

9- List of references:

1. **Text Book:**
   Master Handbook of Acoustics, Sixth Edition 6th Edition by F. Alton Everest (Author), Ken Pohlmann (Author)
2. **Students Lecture Notes**
3. **Handouts**
4. **Recommended Readings:**
   a) Lechner, Norbert. Heating, cooling, lighting: Sustainable design methods for architects. John wiley & sons, 2014.Students Lecture Notes
   b) Tregenza, Peter, and Michael Wilson. Daylighting: architecture and lighting design. Routledge, 2013.
   c) Handbook, IESNA LIGHTING. "(2000)." New York: IESNA (2000).
   d) Goswami, D. Yogi. "Energy Efficiency and Renewable Energy Handbook."
   e) ASHRAE
   f) Carrier load estimation

10- Facilities required for teaching and learning:

- Lecture hall
- White board
- Computer & Data show for presentations
- Internet web connection
- Library
- Computer lab with preinstalled environmental control software such as Ecotect (student version).
- Environmental control field measuring tools such as Lux meter, Sound meter, Thermometer, and Anemometer

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafar**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs											
		A07	A08	A09	B02	B05	B06	B07	C01	C06	C08	C17	D08
Course ILOs	a1.	●											
	a2.	●											
	a3.	●											
	a4.		●										
	a5.	●		●									
	a6.	●		●									
	b1.					●							
	b2.				●								
	b3.							●					
	b4.							●					
	b5.					●							
	b6.						●						
	c1.								●			●	
	c2.									●			
	c3.										●		
	d1.												●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1
1. Developing the relationship between human, building and natural environment through ages	●	●					●									●
2. Lighting and Daylighting-introduction			●				●	●		●	●				●	●
3. Lighting and Daylighting-Methods of Analyzing Daylighting			●	●			●	●	●	●		●	●	●	●	●
4. Lighting and Daylighting- Glare			●	●			●	●	●	●			●			
5. Artificial Lighting systems			●	●		●	●	●	●	●			●			
6. Thermal Comfort - Human Factors			●				●	●			●	●	●	●	●	
7. Thermal Envelope-Glazing			●				●	●			●		●			
8. Thermal Envelope-Ventilation			●				●	●			●		●			
9. Thermal Envelope-Insulation			●				●	●					●			
10. Passive Solar Heating and Cooling			●	●	●		●	●			●		●		●	●
11. Air conditioning systems			●		●		●	●	●		●		●			●
12. Cooling load calculations			●	●	●		●	●	●			●	●	●		
13. Final project Discussion			●	●			●				●	●	●	●		●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1
Lecture	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Research and Assignments	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Project							●			●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix																
Assessment Method	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1
Assignment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Research	●	●	●	●				●							●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●		●			

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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 – 7th 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: **6 Hrs.**
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 technicalinstallations 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- <u>Knowledge and understanding:</u>
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- <u>Intellectual skills:</u>
By the end of this course the student should 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)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 412: Architectural Design (6)
"*Futuristic Architecture*"

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 – 8th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Architectural Design (6) **Code: ARC 412**

Credit Hours: **4Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **6 Hrs.**
Total: **8 Hrs.**

Prerequisite: ARC 412: Architectural Design (5)

B- Professional Information

1- Catalog Course Description:

The main concern and focus of this course will be about the "Future of Architecture". Students will be asked to think and imagine how the architecture works will be at the future. Concepts of "Hyper Architecture", Designing in severe Environments", "Vertical Cities", "Biomimicry in Architecture", "Responsive Architecture", and "Virtual Architecture" may be experienced. The course projects may be such as: Virtual Museum, Floating City, Intelligent Responsive House, and other similar ones.

2- Overall aims of the course:

The main aims of this course are to:

a1. Enhance student's awareness of the futuristic visions of architecture and its various impacts on the society.
a2. Enhance student's awareness of the state of the art technologies, materials, and systems.
a3. Train student to develop limitless visions.

3- Intended learning outcomes of course (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
A14 Demonstrate knowledge and understanding of contemporary engineering topics.
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
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
C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.
C15 Display imagination and creativity.
D02 Discuss and defend ideas
D05 Manage tasks and resources

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>
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.

b- <u>Intellectual skills:</u>
By the end of this course the student should be able to:
b.1. Breakdown multipurpose complex design projects into manageable inter-relatable partial components
b.2. Compare different design objectives and sort them in terms of priorities in the design process.
b.3. Analyze circulation patterns in accordance with architectural projects' elements.
b.4. Analyze site and environmental contexts and features.
b.5. Relate three-dimensional design with images of real sites and places

c- <u>Professional and practical skills:</u>
By the end of this course the student should 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. Produce and present architectural design projects using an appropriate range of media and design-based software.
c.4. Review and criticize similar and existing projects.

d- General and transferable skills:
By the end of this course the student should student should be able to:
d.1. Develop team work co-operative skills
d.2. Communicate effectively
d.3. Manage tasks and resources within constrained time

4- Course ILOs versus Program ILOs relation
See table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Research work for the related topic. Introduction to project	4	13	17
2	Selecting and Discussing the topic per student	6	8	14
3	Alternative Schematic Designs	2	8	10
4	Developing Conceptual Design	2	13	15
5	Implementing and Developing Volumetric Studies	4	13	17
6	Implementing Spatial Organizations	4	15	19
7	Implementing Electronic Models	2	8	10
8	Developing in depth architectural parts of the project	4	8	12
9	Project Presentations	2	4	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%
- Year's Work: 50%
  - Final project: 20%
  - Assignments(research +sketch designs) 30%
- Performance & Participation 10%

9- List of references:
1- Text Books :
Kushner; Marc. **The Future of Architecture in 100 Buildings**, Simon & Schuster UK, 2015

2- Course Notes N/A

3- Recommended Readings:

- (Data Books - Books of Architectural Theories - Selected references for famous buildings and Architects, Periodicals, Web sites, etc)
- 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
- Drawing Boards
- Presentation Board
- Architectural Library
- Computer & 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	A14	B02	B03	B04	C01	C03	C14	C15	D02	D05
Course ILOs	a1.	●	●	●	●									
	a2.	●												
	a3.	●		●	●									
	a4.		●	●	●									
	b1.					●								
	b2.						●							
	b3.					●								
	b4.						●							
	b5.							●						
	c1.								●					
	c2.										●			
	c3.									●				
	c4.											●		
	d1.												●	
	d2.													●
	d3.													●

Table [2]: Course Content/ILOs Matrix

Course Content	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2	d3
Research work for the related topic. Introduction to project and site analysis		●	●	●	●	●	●	●	●	●	●		●	●	●	●
Preparing and implementing base plans and structure systems		●	●		●	●	●	●	●	●	●	●	●			●
Preparing and implementing sections	●	●	●	●			●		●							
Preparing and implementing elevations		●	●	●				●	●							
Final drawings for sections	●	●	●	●								●				●
Final drawings for elevations		●	●	●					●			●				●
General layout and landscape details		●	●	●	●	●	●	●		●						
Sketch design (Spatial Problem)		●	●	●	●	●	●	●	●	●	●	●				●
Exteriors and interiors' circulation patterns.		●	●		●		●	●								
Sketch design (Structural Problem)		●	●	●							●	●				●
Final project presentations & final model preparation.	●	●	●	●	●	●	●	●	●			●				●

Table [3]: Learning Method/ILOs Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2	d3
Practical (Studio work)	●	●		●	●	●	●	●	●	●	●	●	●		●	●
Research	●	●	●	●		●	●	●	●	●			●	●	●	●

Table [4]: Assessment Method/ ILOs Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2	d3
Final examination	●	●	●	●	●	●	●	●	●		●	●				●
Final Project	●	●	●	●			●		●			●				●
(Research + Sketch Designs)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 421: History &Theories of Architecture (5)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level 4 – 7th semester
Date of specification approval:	November 2017

A- Basic Information

Title: History &Theories of Architecture (5) **Code: ARC 421**

Credit Hours:	**3 Cr. Hrs.**
Lectures:	**3 Hrs.**
Total:	**3 Hrs.**
Prerequisite:	**-**

B- Professional Information

1- Catalog Course Description:

An introduction to the concept of space in architecture, demonstrate organizations and relationships of space in an abstract way, regardless to their functions. Case studies (examples) are selected from different eras to exercise the methodologies of obtaining and extracting theories and philosophies from these examples. Basic principles of architectural design are studied in relation to other dimensions of design in visual arts and music, discovering the embedded scientific values and the philosophical background in iconic buildings such as Hagia Sofia an The Alhambra.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Develop awareness considering principles and theories of design in Architecture
2. Share ideas and work in a team or a group
3. Develop representation techniques
4. Develop and achieve the sense of order while dealing with different forms and shapes in design process and development
5. Establish criticism and evaluation criteria
6. Test different schools of design

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.
A04 Demonstrate knowledge and understanding of history of architecture, urban, and regional planning across different eras.
A09 Demonstrate understanding and appreciation to the social, environmental, ethical and economic considerations and human factors affecting the exercise of the architectural decisions.
A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information.
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.
B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.
B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform 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.
D08 Search for information and adopt life-long self-learning.
D11 Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

By the end of this course the student should be able to:
a.1. Demonstrate knowledge and understanding of scientific background (theories and history) of similar building types
a.2. Define design values and illustrate in drawings and sketches possible solutions
a.3. Define the principles of building formation, including the application of design principles, design methods and their relation to human sensations.

b- Intellectual skills:

By the end of this course the student should be able to:
b.1. Analyze existing projects using drawings and diagrams
b.2. Conceptualize, investigate the development of design process and space/form configurations through history
b.3. Recognize architectural designs aspects that integrate social, aesthetic and technical requirements
b.4. Criticize and evaluate different schools of design in architecture

c- Professional and practical skills:

By the end of this course the student should be able to:
c.1. Identify data and requirements for a certain building type and schools of design in architecture
c.2. Use appropriate graphic techniques for representation
c.3. Submit professional good looking complete data, information and drawings

d- General and transferable skills:

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

d.1. Communicate effectively with other people using visual, graphic, written and verbal means
d.2. Work in a self-directed manner
d.3. Work coherently and successfully as a part of a team in assignments
d.4. Manage time and meet deadlines
d.5. Use the Internet in searching for information about specific building types through history

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

Topic	No. of Hours	Lecture
Spatial Relationships and Organizations	3 weeks (3 hrs./week)= **9** hrs.	9 hrs.
Introduction to Islamic Arts and Architecture	2 weeks (3 hrs./week)= **6** hrs.	6 hrs.
Al Hambra Palace Case study	2 weeks (3 hrs./week)= **6** hrs.	6 hrs.
Hagia Sofia Case Study	2 weeks (3 hrs./week)= **6** hrs	6 hrs.
Islamic Architecture Syntax Rules	2 weeks (3 hrs./week)= **6** hrs.	6 hrs.
Mouldings and Patterns	2 weeks (3 hrs./week)= **6** hrs.	6 hrs.
Music in Architecture	2 weeks (3 hrs./week)= **6** hrs	6 hrs.
TOTAL	45 hrs.	45hrs.

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%
- Year work:
  - In Class Quizzes 10%
  - Assignments/Studio work 25%
  - Midterm 15%
  - Participation 10%

9- List of references:

1. **A-Text Book:**
   The Story of Post-Modernism: Five Decades of the Ironic, Iconic and Critical in Architecture, Charles Jenks, 2011, John Wiley &sons, United Kingdom.
   Architecture: Form, Space, and Order 3rd Edition, 2007, John Wiley &sons, Canada.
2. **Students Lecture Notes**
3. **Handouts**
4. **Recommended Readings:**
   Rapoport, Amos. (1977). Human Aspects of Urban Form, Pergamon Press, USA. Hillier, Bill. (1988). The Social Logic of Space. Cambridge University Press, UK.

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data Show for Presentations + Internet Connection.
- Architectural Library

Course coordinator: Prof. Dr.OsamaAlrawi
Head of Department: Prof. Dr. Samir Sadek
Date: November 2017

Course Instructor:

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs										
		A03	A04	A09	A10	B02	B03	B13	B15	C01	D08	D11
Course ILOs	a1		●		●							
	a2	●										
	a3			●								
	b1							●				
	b2					●						
	b3						●					
	b4								●			
	c1											●
	c2									●		
	c3										●	
	d1										●	
	d2											●
	d3										●	
	d4											●
	d5											●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	b1	b2	b3	b4	c1	c2	c3	d1	d2	d3	d4	d5
Spatial Relationships and Organizations				●		●	●	●							
Introduction to Islamic Arts and Architecture		●		●	●	●	●	●				●		●	
Al Hambra Palace Case study				●	●	●			●	●		●	●	●	
Hagia Sofia Case Study	●		●			●	●		●	●	●	●	●	●	
Islamic Architecture Syntax Rules	●	●	●			●			●	●	●	●	●	●	
Mouldings and Patterns		●				●	●		●	●		●	●	●	●
Music in Architecture		●	●			●	●		●	●	●	●		●	●

Table [3]: Learning Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3	d4	d5
Lecture	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Research							●			●	●	●						

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3	d4	d5
Assignment	●	●	●	●	●	●	●	●	●	●	●	●			●		●	
Report												●	●	●		●		●
Exam(s)	●	●	●	●	●	●	●	●	●	●	●	●			●			

جـــــامـــــعة المســـــتقبل

FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 422: History & Theories of Architecture (6)

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 – 8th semester
Date of specification approval:	November 2017

A- Basic Information

Title: History & Theories of Architecture (6) **Code: ARC 422**

Credit Hours: **3 Cr. Hrs.**
Lectures: **3 Hrs.**
Total: **3 Hrs.**

Prerequisite: ARC 421: History & Theories of Architecture (5)

B- Professional Information

1- Catalog Course Description:

The course traces the development of architectural thought in the 2nd half of the 20th century and its effect on architecture, post modernism, deconstructionism, and future trends in architecture. The course also discusses concepts and considerations of educational buildings, transportation buildings and tourist facilities.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Know the most popular pioneers of architecture in the 20th century.
- Know the different concepts and considerations of different types of Architecture.
- Know the new technology software and machines and define its effect on the development of architectural forms execution.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A03. Demonstrate knowledge and understanding of the principles of architectural design and planning, as process and product.
A04. Acquire knowledge and understanding of different histories and theories of architecture across different eras.
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 case studies, evaluate design alternatives and conclude results based on analytical thinking.
C02. Conduct research and collect data from different resources.
C03. Use appropriate techniques for representation.
D02. Present reports and projects, and deliver presentations demonstrating efficiency in IT capabilities.
D03. Discuss conclusions and results of researches or assignments.
D06 Lead and motivate individuals.
D07. Work coherently and communicate effectively as a part of a multidisciplinary team in researches and /or assignments and projects.
D08. Search for information and adopt life-long self-learning.
D09. Work under stressful environments and within constraints of time and budget.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Illustrate how different pioneers effected in the development of architecture through the 20th century.
a2. List different types of trends and styles of Architecture.
a3. List different types of architecture and their advantages and disadvantages.
a4. List different methods and technologies that helped in executing complicated forms in architecture.

b- Intellectual skills:

By the end of this course the student should maintain proficiency level at:

b1. Differentiate between different types of architecture.

c- Professional and practical skills:

By the end of this course the student should maintain proficiency level at:

c.1. Use freehand sketches and drafting to draw architectural sketches.

d- General and transferable skills:

By the end of this course the student should maintain proficiency level at:

d1. Present reports and projects, and deliver presentations demonstrating efficiency in IT capabilities.
d2. Discuss conclusions and results of researches or assignments.
d3. Work coherently and communicate effectively as a part of a multidisciplinary team in researches and /or assignments and projects.
d4. Search for information and adopt life-long self-learning.
d5. Work under stressful environments and within constraints of time.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Weeks	Hours
1	Bauhaus	2	6
2	Organic architecture	3	9
3	Intuitive modernism	2	6
4	The architecture of deconstruction	2	6
5	The high-tech architecture	2	6
6	Digital design	4	12
Total		**15**	**45**

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%
- Year work:
  - In Class Quizzes 5%
  - Researches and assignments 35%
  - Attendance & Participation 10%
  - Mid-term examination(s) 10%

9- List of references:

1. Text Book:

Meiss; Pierre von, **Elements of Architecture: From Form to Place,** 1990

2. Students Lecture Notes.
3. Handouts.
4. Recommended Readings:
   a) **Modern movements in Architecture**, Charles Jencks, 1973, Penguin Books Ltd, United Kingdom.
   b) **Late Modern Architecture**, Charles Jencks, 1980, Rizzoli; First American Edition.
   c) **The Language of Post-Modern Architecture,** Charles Jencks, 1991, Rizzoli; 4th Edition.

10- Facilities required for teaching and learning:

- Lecture Room.
- White board.
- Computer & Data Show for Presentations + Internet Connection.
- Architectural Library.

Course coordinator: **Prof. Dr. Osama Elrawi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs											
		A03	A04	A09	B02	C02	C03	D02	D03	D06	D07	D08	D09
Course ILOs	a1.	●											
	a2.			●									
	a3.		●										
	a4.		●	●									
	b1.				●	●							
	c1.						●	●			●		
	d1.							●					
	d2.								●				
	d3.									●	●		
	d4.											●	
	d5.												●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	c1	d1	d2
BAUHAUS	●	●	●		●	●	●	●
ORGANIC ARCHITECTURE			●	●		●		●
INTUITIVE MODERNISM	●				●	●		●
THE ARCITECTURE OF DECONSTRUCTION			●		●	●	●	●
THE HIGH-TECH ARCHITECTURE	●				●	●		●
DIGITAL DESIGN			●			●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	c1	d1	d2
Lecture	●	●	●	●				
Research	●	●					●	●
Homework	●	●	●	●	●	●		

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	c1	d1	d2
Assignment	●	●	●	●	●	●		
Research	●	●					●	●
Midterm & Final Exam	●	●	●	●	●	●		

جـــــامـــــعة المســـــتقبل

FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 451: Urban Planning I

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

A- Basic Information

Title: Urban Upgrading and Management **Code: ARC 451**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite:

None

B- Professional Information

1- Catalog Course Description:

This course provides the basic understanding knowledge for the urban planning discipline. It illustrates the core methodology of urban planning that is used in the different levels of planning. The students are given a real time project focusing mainly on the district level. The course illustrates how to analyze the present urban situation, formulates a proper development and upgrading vision, and finally formulates a strategic plan for the upgrading of the city.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Identify the different planning approaches used in the ancient civilizations, e.g. Egyptian, Mesopotamian and Greek civilizations.
2. Understand the different levels of urban planning, from region, to city to district.
3. Master the urban planning survey techniques.
4. Be capable of performing the different urban analysis and conducting the different urban studies.
5. Formulate appropriate upgrading techniques for the deteriorated city districts.
6. Come up with a professional master plan for the city district.

7. Become aware of the different upgrading techniques for both the deteriorated and informal districts.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A03 Demonstrate knowledge and understanding of the principles and theories of urban deterioration and, as process and product.

A04 Demonstrate knowledge and understanding of history of architecture, urban, and regional planning across different eras.

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

A15 Demonstrate knowledge and understanding of the processes of spatial change in the built and natural environments; patterns and problems of cities, and positive and negative impacts of urbanization.

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

B07 Incorporate different dimensions of economy, society, environment, technology, applicability, safety, site constraints, urban context and risk management in design.

B10 Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.

B12 Integrate community design parameters into design projects.

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.

C16 Respect all alternative solutions, changes in original plan of the project, differences in style, culture, experience and treat others with respect.

C18 Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.

D01 Communicate effectively.

D02 Discuss and defend ideas.

D06 Lead and motivate individuals.

D07 Work Coherently as a part of a multidisciplinary team.

D09 Work under stressful environments and within constraints of time and budget.

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. Classify the historical city planning approaches of the ancient civilizations.
a2. Identify the problems within the urban environment.
a3. Document the present situation of an urban context.
a4. Recognize the socio-economic and physical aspects of a given urban area.
a5. Know the conventional approaches of strategic urban planning
a6. Outline a proper Master Plan on the city level.

b- <u>Intellectual skills:</u>

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

b.1. Interpret the different urban fabrics within a city.
b.2. Apply the different physical and urban surveys.
b.3. Formulate planning alternatives that integrate social, economic and technical requirements.

b.4. Develop the right planning decision to solve the urban planning problems.

c- Professional and practical skills:

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

c1. Show proper presentation techniques to represent his/her final proposal.

c2. Propose realistic strategies for planning and upgrading existing areas.

c3. Identify the related stakeholders in the planning projects.

c4. Apply the learned methods on realistic projects.

d- General and transferable skills:

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

d1. Discuss and defend his/her ideas.

d2. Work in a team from the beginning of the project to its end.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

#	Topics	Tutorial	Hours	Total
1	Introduction to the Course	2	2	4
	Planning History : Egypt	2	2	4
2	A common language in planning / Urban planning methodology	2	2	4
3	The city and its components / Making the base map /designing urban surveys	2	2	4
4	Visual analysis studies /	2	2	4
5	1st Midterm Presentation / Planning History: Mesopotamia	2	2	4
6	Urban problems, limitations and potentials / Traffic and transportation	2	2	4
7	Making a city Vision / Setting an upgrading strategy	2	2	4
8	Setting Planning Alternatives	2	2	4
9	2nd Midterm presentations / Planning History: Roman and Greek	2	2	4
10	Socio-economic studies	2	2	4
11	Dealing with Informal and deteriorated settlements 1	2	2	4
12	Dealing with Informal and deteriorated settlements 2	2	2	4
13	The Master Plan	2	2	4
14	Final follow up and discussion.	2	2	4
15	Final presentation and end work	2	2	4
Total		30	30	60

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%
  - Written Exam 40 %
- Year work:
  - First Mid Term Exam 25%
    - 1st Submission 5 %
    - 2nd Submission 15 %
    - 3rd Submission 5 %

- Second Mid Term Exam 25%
  - 1st Submission 5 %
  - 2nd Submission 10 %
  - 3rd Submission 10 %
- Participation ..... 10 %

- **Total 100%**

9- List of references:

- Text book: Lynch, K., The image of the city, MIT, 1960.

التخطيط العمراني جزئين- 2007، أ.د/ شفق الوكيل

- Recommended books

- EL.Wakil, S., Urban Planning: Principles, Basics & Applications, Cairo, 2006.
- Levy, J. Contemporary urban planning , Routledge, 2016
- Weber, R. and Randal, C, The oxford handbook of urban planning, Oxford, 2015.

- Periodicals, Web sites, etc.

- Town planning review
- Journal of urban planning and development
- **http://www.planning.org/planning/**

10- Facilities required for teaching and learning:

- White board
- Computer and Data show for presentations
- Architectural Library
- Internet connection

Course coordinator: **Assoc. Prof. Dr. Yehya M. Serag**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Program ILOs/Course ILO Matrix

		Program ILOS															
		A03	A04	A09	A15	B02	B07	B10	B12	C14	C16	C18	D01	D06	D02	D07	D09
Course ILOs	a1.		●														
	a2.	●			●												
	a3.			●	●												
	a4.			●													
	a5.				●												
	a6.		●		●												
	b1.						●		●								
	b2.					●											
	b3.						●	●									
	b4.						●	●	●								
	c1.									●							
	c2.									●	●	●					
	c3.											●					
	c4.										●	●					
	d1.												●				●
	d2.													●	●	●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c3	c4	d1	d2
Introduction to the Course	●				●							
Planning History : Egypt				●								
A common language in planning / Urban planning methodology			●	●		●				●	●	●
The city and its components / Making the base map /designing urban surveys			●	●	●	●				●	●	●
Visual analysis studies /										●	●	●
1st Midterm Presentation / Planning History: Mesopotamia		●	●	●		●			●	●	●	●
Urban problems, limitations and potentials / Traffic and transportation							●	●	●	●	●	●
Making a city Vision / Setting an upgrading strategy							●	●	●	●	●	●
Setting Planning Alternatives										●	●	●
2nd Midterm presentations / Planning History: Roman and Greek				●					●	●		
Socio-economic studies		●		●						●		
Dealing with Informal and deteriorated settlements 1		●		●						●		
Dealing with Informal and deteriorated settlements 2							●	●		●	●	●
The Master Plan							●	●			●	●
Final follow up and discussion.											●	●

Table [3]: Teaching Method/ILO Matrix																
Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
Lecture	●	●	●	●	●	●	●	●	●	●			●			
Applied Project		●	●			●	●	●	●	●	●	●	●	●	●	●
Search for Data (Self-study)												●	●	●		
Project Presentations		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix																
Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
Intermediate project presentations		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Final project presentation & oral exam	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Final exam	●		●			●	●		●	●	●	●				

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 452: Urban Design & Housing 1

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 – 8th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Urban Design & Housing 1 **Code: ARC 452**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite:

B- Professional Information

1- Catalog Course Description:

Area of Study:

This course introduces the students to the approaches, techniques and tools of urban design necessary to structure the spatial and dimensional relationships of the built environment. The morphology of the city and the relationship of built form to circulation networks and open space configurations will be the primary subject of the class. This course concentrates on the design of urban spaces, housing clusters and residential neighborhoods, informed by (but independent of) the demands of quantitative analysis, decision-making frameworks, economic forecasting or the specifics of plan implementation.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Demonstrate the application of methods and techniques of urban design theories.
- Differentiate between the urban design and its area of work through the practical field of urban planning, urban design and architecture,
- Demonstrate the socio- cultural- economic aspects in housing projects through the new development level.
- Assist in developing skills and techniques in the fields of urban design and hosuing.

- Distinguish the skills of the research tools, and the tools of research methodology; data gathering, analysis, and documentation.
- Mange the determination of the problems, and create tools to solve the problems in the field of urban design, urban conservation and preservation.
- Assess the urban documentation by using the different methods; reports will supplementary material, which may include.
- Communicate effectively with others.
- Make a decision in accordance with the available resources.

3- Intended learning outcomes of course (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.
A09 Demonstrate understanding and appreciation to the social, environmental, ethical and economic considerations and human factors affecting the exercise of the architectural decisions

A15 Demonstrate knowledge and understanding of the processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.

A16 Demonstrate knowledge and understanding of the significance of urban spaces and the interaction between human behavior, built environment and natural environment.
A18 Demonstrate knowledge and understanding of Various dimensions of housing problem and the range of approaches, policies, and practices that could be carried out to solve this problem.

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

B12 Integrate community design parameters into design projects.

B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.

C16 Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.

C19 Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.

D01 Communicate effectively.

D02 Discuss and defend ideas.

D05 Manage tasks and resources

D10 Acquire entrepreneurial skills

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a.1. Identify the urban design and housing theories and movements.

a.2. Recognize urban design element for the new development projects.

a.3. Point different elements of the built environment and housing projects.

a.4. Outline the socio-cultural, socio-political, socio-economic issues to urbanism and new urbanism movements.

b- Intellectual skills:

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

b.1. Apply the design process in the project.

b.2. Analyze data on different levels

b.3. Assess existing urban design and housing projects, & elements of the built environment

b.4. Suggest and evaluate alternative urban design settings

c- Professional and practical skills:

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

c.1. Construct project out line.

c.2. Specify problems with great complexity.

c.3. Design alternative solutions to large scale urban design and housing projects that integrate different social and cultural variables and encompass all scales of environmental design.

c.4. Judge the applications of contemporary tools and approaches to urban design problems.

d- General and transferable skills:

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

d.1. Present projects and data using different techniques (computer, manual… etc.).

d.2. Communicate effectively with others.

d.3. Presenting the work using common techniques and tools

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

#	Course Content	Lec	Tut	Total
1	Introduction	2	2	4
2	The relationships between man and environment,	2	2	4
3	Method and Techniques, Urban Design physical components	2	2	4
4	Urban Form Generation; Spatial Form	2	2	4
5	Urban Control	2	2	4
6	1st submissions and follow up of all staff comments.	2	2	4
7	History of urban design as a field of practice.	2	2	4
8	Theory of urban design	2	2	4
9	Visual aspects in large urban design projects.	2	2	4
10	Elements of Open Spaces/Urban Spaces	2	2	4
11	Housing clusters/ Project follow up	2	2	4
12	2nd submissions and follow up of all staff comments	2	2	4
13	Housing: neighborhood unit	2	2	4
14	Landscape Architecture for large urban design and housing projects.	2	2	4
15	3rd submissions	2	2	4
Total		30	30	60

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%

- Year work:
  - In Class Quizzes 20%
  - Assignments/Studio work 30%
  - Participation……...10%

9- List of references:

1. **Text Book:**
   Carmona, Matthew, Taner Oc. Et all, Public Places - Urban Spaces: The Dimensions of Urban Design, Boston : Architectural Press, (2003).
2. **Students Lecture Notes**
3. **Handouts**
4. **Recommended Readings:**

[1] Bentley, Alcock, Murrain, Mcglynn, and Smith, Responsive Environments, A Manual for designer, Butterworth Architecture, (1985).
[2] Gosling, David, Gordon Cullen: Visions of Urban Design, Academy Editions, (1996)
[3] Llewelyn-Davies, Urban Design Compendium, English Partnerships, The Housing Corporation, First Published (2000).
[4] Moughtin. Cliff. ET, Urban Design; Method and Techniques, Architectural Press. (1999).
[5] Moughtin. Cliff. ET, Urban Design; Street and Square, Third Edition, , Architectural Press. (2003).
[6] Moughtin. Cliff. ET, Peter Shirley, Urban Design; Green Dimensions, Second Edition, Architectural Press. (2005).
[7] Fleming, John, ET. Al., the Penguin Dictionary of Architecture and Landscape Architecture, the Penguin Group, Fifth Edition, (1998)
[8] Alexander, Christopher, A. Neis, H. Anninou, A., and King, I., A New Theory of Urban Design, Oxford: Oxford University Press, (1987)
[8] Brolin, Brent. Architecture in Context. Fitting New Buildings with Old, Van Nostrand Reinhold Company. N.Y., USA. (1980).
[9] Gosling, David. Et. Al., Concepts of Urban Design, Academy Editions. Martin's Press. London. Britain. (1984)
[10] Krier, Robert, Urban Space, Academy edition, Rizzoli, New York, (1979).
[11] Jon Lang (2005), URBAN DESIGN :A TYPOLOGY OF PROCEDURES AND PRODUCTS, Illustrated with over 50 Case Studies, the Master in Urban Development

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer and Data show for presentations
- Architectural Library
- Internet connection

Course Coordinator: **Assoc. Prof. Dr. Yehya M. Serag**
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	A09	A15	A16	A18	B02	B12	B15	C14	C16	C19	D01	D02	D05	D10
Course ILOs	a1.	●	●													
	a2.	●		●												
	a3.			●	●											
	a4.				●	●										
	b1.															
	b2.						●	●								
	b3.						●									
	b4.								●							
	c1.									●						
	c2.									●						
	c3.										●					
	c4.											●				
	d1.												●			
	d2.														●	●
	d3.													●		

Table (2): Course content/ ILOS

Course Content	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Introduction	●	●		●											
The relationships between man and environment,		●	●	●		●			●	●				●	
Method and Techniques, Urban Design physical components		●	●	●		●			●	●				●	
Urban Form Generation; Spatial Form		●	●			●			●	●	●		●		●
Urban Control		●	●			●				●	●		●		●
1st submissions and follow up of staff comments.		●	●	●	●	●	●		●	●	●	●	●	●	●
History of urban design as a field of practice.	●			●	●		●	●				●			●
Theory of urban design	●		●		●			●		●		●			●
Visual aspects in large urban design projects.	●		●		●			●				●			●
Elements of Open Spaces/Urban Spaces	●			●	●	●	●	●		●	●	●	●		
Housing clusters/ Project follow up	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2nd submissions and follow up of staff comments	●	●	●		●			●		●	●				
Housing: neighborhood unit		●	●		●		●	●		●		●			●
Landscape Architecture for large urban design and housing projects.		●	●		●		●	●				●	●		●
3rd submissions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [3]: Learning method/ ILOs

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Lecture	●	●	●	●											
Research	●	●	●	●							●	●	●	●	●
Class Work					●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Course Assessment	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Presentations	●	●										●	●	●	●
Final and Pre Final Project			●						●	●	●	●			
Sketch Design			●		●	●	●	●	●	●	●	●			

Final Term Examination			●		●			●		●	●				

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 453: Landscape Architecture

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 – 8th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Landscape Architecture **Code: ARC 453**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: Architectural Design 4

B- Professional Information

1- Catalog Course Description:

This course introduces the approaches, techniques and tools of Landscape Architecture. This is to understand the different five elements of the landscape; landform, water, vegetation, site furniture and paths. The students will be able to apply the design process of the landscape architecture in projects of different scales.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Develop landscape design process awareness (including data gathering and analysis).
2. Develop the ability to study, analyses and solve a complex of design problems that relate to the outdoor environment.
3. Develop drawing and representation techniques.
4. Present the vocabulary, significance, characteristics, potential uses and design guidelines for landform, pavements, site structures and water-features in landscape architecture design.
5. Gain a basic understanding of the significance and use of the major physical components of the outdoor environment.
6. Establish solid links between different disciplines of landscape architecture, architecture design and urban design.

7. Test different design alternatives.

3- Intended learning outcomes of course (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

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information

A16 Demonstrate knowledge and understanding of the significance of urban spaces and the interaction between human behavior, built environment and natural environment.

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

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

B07 Incorporate different dimensions of economy, society, environment, technology applicability, safety, site constraints, urban context and risk management in design.

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

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.

C15 Display imagination and creativity.

D01 Communicate effectively.

D02 Discuss and defend ideas.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

By the end of this course the student should be able to:
a1 Interpret elements of landscape design.
a2 Identify historical background of the world's landscape.
a3 List different landscape architecture ideas and their applications in different projects.

b- Intellectual skills:

By the end of this course the student should be able to:
b1 Evaluate different landscape projects
b2 Generate alternative solutions according to different environmental conditions

c- Professional and practical skills:

By the end of this course the student should be able to:
c1 Design different landscape solutions and projects that integrate program, materials and Structure
c2 Prepare detailed drawings of landscape architecture applications and site design
c3 Express the ideas and concepts by 3d models

d- General and transferable skills:

By the end of this course the student should be able to:
d1 Work in teams.
d2 Use different techniques and photography with focusing on manual techniques to present concept and ideas.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

Week No.	Course Content	Lecture	Design Studio	Total
1	Lecture: introduction to the Scope of specialization in LA and interdisciplinary professional practice Introduction to the Elements of LA 1st exercise: Identifying the 5 elements of LA in the FUE campus Class work: Class Organization	2	2	4
2	Lecture: The Land form / Design Process: (Inventory and Site Analysis) Classwork: follow up and correction of the 1st exercise	2	2	4
3	Lecture: Water elements / Design Process: Zoning and conceptual plan Classwork: 1st project brief	2	2	4
4	Lecture: Vegetation / Design process: Structural Plan Classwork: Site analysis and site inventory of the project	2	2	4
5	Lecture: Paths/ Design Process: The master plan Classwork: Zoning and concept of the project	2	2	4
6	Lecture: Site furniture Classwork: Follow up on the conceptual plan	2	2	4
7	Lecture: Discussion of student researches (1) Classwork: discussion of the Draft master plan	2	2	4
8	Submission of the first project	2	2	4
9	Lecture: Discussion of student researches (2) Classwork: Introduction to the second project	2	2	4
10	Follow up on the site inventory and analysis	0	4	4
11	Follow up and discussion of the conceptual plan and zoning	0	4	4
12	Pin up of the structural plan + Discussion	0	4	4
13	Pre-final assessment of the Master plan + Discussion	0	4	4
14	Final follow up	0	4	4
15	Final Submission for the 2nd Project	0	4	4
Total		20	40	60

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%
- Year work: 50%
  - 1st Exercise ……...5%
  - First project 20%
  - Second project 25%
- Performance & Participation 10%

9- List of references:

1. **Text Book:**

   Norman K. Booth, Basic Elements of Landscape Architectural Design", Ohio State University, Waveland Press, INC, Illinois, 1990.

2. **Students Lecture Notes**

3. Periodical

- "Total Landscape Care Magazine".
- "Landscape Magazine"
- "Lawn & Landscape", UK.
- "Landscape Architecture", magazine of the American Society of Landscape Architects
- "Fine Gardening" American magazine
- "Canadian Gardening", Canadian magazine.
- "Horticulture" The Art & Design of smart gardening magazine, UK.
- "The English Garden", UK.
- "Contractor Landscape + Landscape Manager Magazine", Australia.
- "Easy Container gardens" magazine.
- "Luxury Landscapes", America.
- "The Essential Guide to Landscape Photography" is produced by the experts at Digital SLR Magazine.
- "JOLA" Journal (International Journal of Landscape Architecture)
- http://www.gardendesign.com/
- http://www.informationvine.com/home-garden/outdoor-living/landscaping/best-magazines-landscape-design-ideas
- http://www.thebutterflysite.com/gardening.shtml
- http://www.freeconstructionmagazines.com/landscape-magazines/

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Data show for presentations
- Architectural Library

Course coordinator: **Associate Prof. Dr. Yehya Serag**
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	A10	A16	B02	B04	B07	C03	C14	C15	D01	D02
Course ILOs	a1	●	●									
	a2	●		●								
	a3			●								
	b1				●							
	b2					●	●					
	c1							●				
	c2								●			
	c3									●		
	d1										●	
	d2											●

Table [2]: Course Content/ILO Matrix

Course Content	a1	a2	a3	b1	b2	c1	c2	c3	d1	d2
week 1	●	●								
week 2		●				●				●
week 3		●				●				●
week 4	●		●		●	●			●	
week 5	●		●						●	
Week 6				●		●				
week 7	●		●				●			
week 8	●		●				●			
week 9	●		●				●			
week 10				●	●			●	●	
week 11					●	●		●	●	●
week 12							●	●		
week 13					●		●	●		
week 14			●	●		●	●	●	●	
week 15			●	●		●	●	●	●	●

Table [3]: Learning method/ ILOs

Learning method	a1	a2	a3	b1	b2	c1	c2	c3	d1	d2
Lecture	●	●	●							
Research	●	●	●					●	●	●
Class Work				●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	c1	c2	c3	d1	d2
Presentations	●	●			●	●	●			●	●
Final and Pre Final Report			●				●	●	●		
Final Term Examination	●	●	●	●	●	●					

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 471: Execution Designs (1)

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

A- Basic Information

Title: Execution Designs (2) **Code: ARC 471**

Credit Hours: **4 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **4 Hrs.**
Total: **6 Hrs.**
Prerequisite: ARC 342 , ARC 361 , & ARC 362

B- Professional Information

1- Catalog Course Description:

The students will know about the basics of drafting working drawings. They will learn how to follow dimensioning and coding systems. In addition, they will learn how to use the different coding systems. They will also practice coordinating between architectural, structural, and electromechanical needs. Their practice will be on a small to moderate scale project.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Demonstrate an entire set of working drawings presenting a complete set of documents for an architectural project with weight on structural, construction and technical working details.
- Address areas like materials and various finishing
- Produce preliminary technical mechanical and electrical documents for a chosen architectural project.

3- Intended learning outcomes of course (ILOs):

3-1 Program ILOs that are achieved by the course:

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques;
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
B03 Solve architectural problems often on the basis of limited and possibly contradicting information
B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions
B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.
C05 Prepare and present technical reports, working drawings, and construction documents for design projects
C11 Apply quality assurance procedures and follow codes and standards.
C12 Exchange knowledge and skills with engineering community and industry.
C13 Use appropriate construction techniques and materials to specify and implement different designs;
D05 Manage tasks and resources.
D06 Lead and motivate individuals.
D07 Work coherently as a part of a multidisciplinary team.
D08 Search for information and adopt life-long self-learning**.**
D09 Work under stressful environments and within constraints of time and budget
D11 Refer to relevant literatures

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. List some of the structural systems that are suitable to moderate and wide spans.
a2. List the main complementary systems _structural and electromechanical systems_ that are integrated within the architectural design.
a3. Define the annotating and dimensioning principals for construction drawings.
a4. Explain the CSI coding system for construction sheets and digital files.

b- <u>Intellectual skills:</u>

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

b1. Modify the schematic design of moderate projects to suit the execution process.
b2. Drive different solutions to coordinate between multidisciplinary systems.
b3. Code construction drawings sheets according to the CSI coding system.

c- <u>Professional and practical skills:</u>

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

c1. Prepare construction drawings.
c2. Apply annotation and dimensioning standards.
c3. Remark, graphically, complementary structural and electromechanical systems designs.
c4. Coordinate between multidisciplinary designs.

d- <u>General and transferable skills:</u>

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

d1. Manage time to meet deadlines.
d2. Share ideas via communicating with others.
d3. Search for relevant information.
d4. Work within constraints of time.

d5. Refer to data sources.
d6. Listen to other's thoughts.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Tot.
1	Introduction to Preparation of execution drawings for projects	2	4	6
2	Fundamentals of working drawings of a pre-designed project	2	4	6
3	Preliminary stage: site drawings	2	4	6
4	Preliminary stage: plans	2	4	6
5	Preliminary stage: sections	2	4	6
6	Research: finishing materials	2	4	6
7	Preliminary stage: elevations	2	4	6
8	Mid Term Exam , Revision	2	4	6
9	Research: Coordination between multidisciplinary systems.	2	4	6
10	Sanitary drawings	2	4	6
11	Electrical drawings : Lighting & Sockets	2	4	6
12	Electrical drawings : Light Current; Fire Alarm, CCTV, Access control, … etc.	2	4	6
13	HVAC drawings	2	4	6
14	Final project (Full drawings of preliminary stage)	4	8	12
Total		30	60	90

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%
- Year's work: 50%
  - Midterm 1 15%
  - Midterm 2 15%
  - Assignments/Lab work 20%
- Participation 10%

9- List of references:

1. **Text Book:**
   Working Drawing manual by Fred Slitt, 1998, McGraw Hill
2. **Lecture Notes.**
3. **Presentations.**

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data show for presentations

- Internet Connection
- Architectural Library

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafar**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs														
		A06	A07	B03	B05	B06	C05	C11	C12	C13	D05	D06	D07	D08	D09	D11
Course ILOs	a1.	●														
	a2.		●													
	a3.	●														
	a4.	●														
	b1.			●												
	b2.				●											
	b3.					●										
	c1.						●									
	c2.							●								
	c3.								●							
	c4.									●						
	d1.										●					
	d2.												●			
	d3.													●		
	d4.														●	
	d5.															●
	d6.											●				

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3	d4	d5	d6
Introduction to Preparation of execution drawings for projects	●	●			●			●			●						
Fundamentals of working drawings of a pre-designed project	●	●		●	●			●			●						
Preliminary stage: site drawings		●	●		●	●		●			●				●		
Preliminary stage: plans	●	●	●		●	●		●	●		●				●		
Preliminary stage: sections	●	●	●		●	●		●	●		●				●		
finishing materials								●	●						●		
Preliminary stage: elevations	●		●		●	●		●	●		●				●		
Research: Coordination between Architectural, Structural & Electromech.drawings.	●	●	●		●	●	●	●			●	●	●	●	●	●	●
Sanitary drawings		●	●	●			●	●	●	●	●				●		
Electrical drawings		●	●	●			●	●	●	●	●				●		
HVAC drawings		●	●	●			●	●	●	●	●				●		
Introduction to Preparation of execution drawings for projects			●	●			●	●	●		●	●	●	●	●	●	●

Table [3]: Teaching Method/ILO Matrix																	
Teaching Method	a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3	d4	d5	d6
Lecture	●	●	●	●	●											●	
One to One Discussion					●	●	●	●				●	●				
Project based teaching			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Research	●	●										●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix																	
Assessment Method	a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	c4	d1	d2	d3	d4	d5	d6
Project drawings submittal			●	●	●	●	●	●	●	●	●	●	●		●		
Project portfolio	●	●				●					●			●		●	●
Research presentation	●	●					●		●	●		●	●	●	●	●	●
Written exams	●	●	●	●	●	●	●	●		●	●	●			●		

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 472: Execution Designs (2)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic Level:	Level Four – 8th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Execution Designs (2) **Code: ARC 472**

Credit Hours: **4 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **4 Hrs.**
Total: **6 Hrs.**

Prerequisite: ARC 471: Execution Designs (1)

B- Professional Information

1- Catalog Course Description:

The main concern of this course will be on detailing the execution and construction issues. Sketches and diagrams needed to clarify in all main stages of design and execution, the way in which building industry is becoming a main tool in building construction. The research and understanding of the function of material in design, the ability to design with material, and the techniques of manipulating representations of material structures through digital tectonics that has become a burgeoning part of the architectural knowledge. In addition, the student will know how to follow rules while writing the technical specifications of building/construction items. Their practice will be on a moderate scale project.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Make detailed design for architectural spaces.
- Writing the technical specifications of various elements, finishes, furniture, installations and other similar things that is used in the designed space.
- Merging architectural design with fixation systems, tools and equipment that are supplied from manufactures.
- Utilize the latest technology of CNC into building construction.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques;

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline;

A17 Demonstrate knowledge and understanding of the role of the architecture profession relative to the construction industry and the overlapping interests of organizations representing the built environment;

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions

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

C05 Prepare and present technical reports, working drawings, and construction documents for design projects

C11 Apply quality assurance procedures and follow codes and standards.

C12 Exchange knowledge and skills with engineering community and industry.

C13 Use appropriate construction techniques and materials to specify and implement different designs;

D05 Manage tasks and resources

D09 Work under stressful environments and within constraints of time and budget

D11 Refer to relevant literatures

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. Identify the objectives of the detailing and blowups construction drawings.

a2. Outline the characteristics of finishing materials and fixation systems and techniques in relation to the function of buildings.

a3. List the advantages and the disadvantages of utilizing CNC technology into building construction industry.

a4. Distinguish the rules of writing technical specifications of building/construction items.

b- <u>Intellectual skills:</u>

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

b1. Analyze solution problems related to building constructions.

b2. Derive different solutions in solving architectural problems related to building constructions with emphasis on working details.

b3. Appraise alternative architectural and structural systems with reference to building constructions.

b4. Design assembly details of multi construction components of multi manufacturers.

c- <u>Professional and practical skills:</u>

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

c1. Draw construction detailing drawings.

c2. Write detailed and professional item specifications.

c3. Apply CAD standards in construction drawings.

c4. Utilize new techniques used in materials and working details.

d- General and transferable skills:

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

d1. Managing time to meet deadlines.
d2. Work within constraints of time.
d3. Refer to data sources.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Tot.
1	Introduction to Preparation of integrated execution drawings for projects	2	4	6
2	Preparation of working drawings of a pre-designed project	2	4	6
3	Integration between Architectural, Civil, & Electromechanical drawings.	4	8	12
4	Introduction to technical specifications	2	4	6
5	Detailing the execution and construction drawings	4	8	12
6	Midterm Exam, Revision	2	4	6
7	Introduction to Detailing concepts	2	4	6
8	Introduction to function of materials in design	2	4	6
9	Rules of writing the technical specifications	4	8	12
10	Integration between Architectural, Civil, & Electromechanical technical specifications.	2	4	6
11	Coordination Skills & techniques to manage Architectural, Civil, & Electromechanical drawings.	2	4	6
12	Final project	4	8	12
Total		30	60	90

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%
- Year's work: 50%
  - Midterm 1 15%
  - Midterm 2 15%
  - Assignments/Lab work 20%
- Participation 10%

9- List of references:

1. **Text Book:**
   Fundamentals of Building Construction: Materials and Methods, 5th Edition by Edward Allen (Author), Joseph Iano (Author), 2013
2. **Lecture Notes.**
3. **Presentations.**

4. **Handouts (Moodle)**

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data show for presentations
- Internet Connection
- Architectural Library

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafar**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs												
		A06	A12	A17	B03	B05	B11	C05	C11	C12	C13	D05	D09	D11
Course ILOs	a1.	●												
	a2.		●											
	a3.			●										
	a4.			●										
	b1.				●									
	b2.					●								
	b3.						●							
	b4.						●							
	c1.							●						
	c2.									●				
	c3.								●					
	c4.										●			
	d1.											●		
	d2.												●	
	d3.													●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Introduction to Preparation of integrated execution drawings for projects	●			●	●		●	●	●		●				
Preparation of working drawings of a pre-designed project	●	●		●	●	●	●	●	●		●		●	●	
Integration between Architectural, Civil, & Electromechanical drawings.	●				●	●	●	●	●		●	●			
Introduction to technical specifications	●	●		●					●	●		●			
Detailing the execution and construction drawings		●		●	●	●	●		●	●	●	●	●		
Introduction to CNC technology			●	●	●	●	●	●	●	●		●		●	●
Introduction to function of materials in design	●	●	●	●	●	●			●	●					
Rules of writing the technical specifications		●	●	●						●					
Integration between Architectural, Civil, & Electromechanical technical specifications.		●		●	●	●			●	●		●			
Coordination Skills & techniques to manage Architectural, Civil, & Electromechanical drawings.	●	●	●		●	●		●							
Final project	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [3]: Teaching Method/ILO Matrix															
Teaching Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Lecture	●	●	●	●	●	●	●	●					●		
One to One Discussion					●	●	●	●	●	●	●	●			●
Project based teaching		●	●	●	●	●	●	●	●	●	●	●	●	●	
Research		●	●	●				●				●	●		●

Table [4]: Assessment Method/ILO Matrix															
Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Project drawings submittal		●	●	●	●	●	●	●	●	●	●	●	●	●	
Project portfolio	●	●	●	●	●			●		●		●			●
Research presentation	●		●		●								●	●	●
Written exams	●		●	●	●	●	●	●	●	●	●	●	●	●	

جـــــامـــــعة المســـــتقبل

FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 501: Graduation Project Studies

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic Level/Semester:	Level Five - 9th Semester
Date of specification approval:	November 2017

A. Basic Information

Title: Graduation Project Studies **Code: ARC 501**

Credit Hours: 2 Cr. Hrs. **Prerequisites: ARC 412**

Lectures: 2 Hrs.

Tutorial: 1 Hrs.

Total: 3 Hrs.

B. Professional Information

1- Catalog Course Description:

The course aims at preparing the preliminary studies to the final design studio (the Graduation Project) that includes the basic criteria of design, the formulation and development of the program, site evaluation, collecting necessary data and analytical studies of program and site. Precedents and similar architectural projects are also studied, analyzed, argued and compared. This is an integrated study that combines the collective outputs of previous architectural, technical, environmental, urban design and planning studies and knowledge acquired through the years of study that finally leads to the required architectural and urban program.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Develop different techniques of information gathering and data analysis in relation to a specific design theme
- Develop knowledge and skills in the different processes of site selection and analysis, collecting necessary data and information,

design standards and criteria, and performing analytical studies of program and site for the project and other similar projects
- Analyze and criticize architectural projects through different case studies
- Prepare the preliminary studies to the Graduation Project that includes the basic criteria of design in addition to a fully developed architectural program

3- Intended learning outcomes of course (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

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

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information.

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

B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment

C05 Prepare and present technical reports, working drawings, and construction documents for design projects

D01 Communicate effectively

D02 Discuss and defend ideas

D09 Work under stressful environments and within constraints of time and budget

D11 Refer to relevant literatures

3.2. Course Detailed ILOs:

a. Knowledge and understanding:

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

a.1. Identify contemporary engineering, architectural and urban topics
a.2. List clients' needs/requirements for designing a certain building type
a.3. Interpret different methods of data collection and analysis
a.4. Illustrate a structure for the graduation project's technical report

b. Intellectual skills:

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

b.1. Compare different case studies
b.2. Formulate different alternatives based on analytical thinking
b.3. Assess data collected from different resources

c. Professional and practical skills:

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

c.1. Prepare the Architectural Program using appropriate techniques for representation utilizing a mix of different media

d. General and transferable skills:

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

d.1. Communicate effectively with others using visual, graphic, written and verbal means

d.2. Discuss ideas

d.3. Manage time under stressful environments and budget constraints

4- Course ILOs versus Program ILOs relation

See Appendix, Table [1]

5- Course Contents:

Topic	No. of Hours	Lecture	Tutorial/ practical	Total
Project Selection	2weeks (3 hrs./week)	4 hrs.	2 hrs.	6 hrs.
Project Brief	3 week (3 hrs./week)	6 hrs.	3 hrs.	9 hrs.
Site Selection and Analysis	3 weeks (3 hrs./ week)	6 hrs.	3 hrs.	9 hrs.
Examples and Use of Precedents	3 weeks (3 hrs./week)	6 hrs.	3 hrs.	9 hrs.
Program Development and Analysis	3 weeks (3 hrs./week)	6 hrs.	3 hrs.	9 hrs.
Final Submission: Program; Report & Poster	1 weeks (3 hrs./week)	2 hrs.	1 hrs.	3 hrs.
TOTAL	45 hrs.	30 hrs.	15 hrs.	45 hrs.

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 Research Submission: 40%
- Year's work: 50%
  - First preliminary research submission 10%
  - Second preliminary research submission 15%
  - Final research submission 25%
- Participation 10%

9- List of References:

Text Book:

- Pena, W., Parshall, S. and Kelly, K., Problem Seeking; An Architectural Programming Primer, AIA Press, Washington, USA, 2012

Reading List:

- Course notes and lectures are available on the “Moodle” for all participants
- Recommended Readings:
- Any books related to the student's chosen building type

- Architectural Magazines and Projects
- Periodicals, Web sites, … etc

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computers and data show for presentations
- Architectural Library
- Internet Connection

Course coordinator: Prof. Dr. Samir Sadek Hosny
Head of Department: Prof. Dr. Samir Sadek Hosny
Date: November 2017

Course Instructor:

Appendix

Table [1]: Course ILOs/Program ILOs Matrix

		Program ILOs											
		A03	A09	A10	A13	A14	B02	B05	B13	C05	D01	D02	D09	D11
Course ILOs	a1	●	●			●								
	a2		●	●										
	a3			●										
	a4				●									
	b1						●							
	b2							●						
	b3								●					
	c1									●				
	d1										●			
	d2											●		●
	d4												●	

Table [2]: Course Content/ILOs Matrix

Course Content	a1	a2	a3	a4	b1	b2	b3	c1	d1	d2	d4
Project Selection	●	●	●		●						
Project Brief				●		●			●		
Site Selection and Analysis	●	●			●	●	●				
Examples and Use of Precedents			●		●	●	●				
Program Development and Analysis				●				●			
Final Submission; Report & Poster	●	●	●	●	●	●	●	●	●	●	●

Table [3]: Learning Method/ILOs Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	c1	d1	d2	d4
Lectures and Presentations on Different Aspects of the Design Problem	●			●				●			
Information Collection from Different Sources	●	●	●				●				
Research Presentation				●		●		●	●	●	●
Class Discussions, Sessions and Research Critiques	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILOs Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	c1	d1	d2	d4
Report / Poster	●	●	●								
To assess ability to gather suitable data and process information"					●				●	●	
Oral presentations						●	●		●	●	
Preliminary Presentations	●	●	●		●	●	●	●	●	●	
Research-based work	●	●	●	●	●	●	●	●	●		●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 502: Graduation Project
"*Realistic Projects*"

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 Five – 10th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Graduation Project **Code: ARC 502**
Credit Hours: **5 Cr. Hrs.**
Tutorial: **11 Hrs./Week**

Prerequisite: ARC 501: Graduation Project Studies

B- Professional Information

1- Catalog Course Description:

The final design studio deals with a complex design problem to reflect the student's understanding and skills in handling and integrating all knowledge gained through the years of study. The goal is to achieve project's objectives on both architectural and urban levels as well as details.

2- Overall aims of the course:

The main aims of this course are to:

- Enhance student's awareness of the importance of fulfilling the urgent real needs of the country and to follow the strategic plans of the government.
- Train student to deal with real life situations and to manipulate conflicting requirements and needs in case of complex and mega scale projects.

3- Intended learning outcomes of course (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.
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.
B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions.
C03 Use different expression techniques to visualize ideas verbally and graphically, either manually or digitally
C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.
C16 Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.
C19 Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.
D01 Communicate effectively.
D02 Discuss and defend ideas.
D08 Search for information and adopt life-long self-learning.
D09 Work under stressful environments and within constraints of time and budget.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Explain scientific background (theories and history) of similar building types.

a2. Define highly complicated design problems and illustrating in drawings and sketches the possible solutions.

a3. Define the principles of building technologies, including the application of structures, construction methods, materials and environmental design in relation to human needs.

a4. Identify data and requirements for designing complex mega projects which are similar to his/her own building type.

b- Intellectual skills:

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

b1. Solve design problems using models, drawings and diagrams.

b2. Conceptualize ideas in the form of three dimensional objects and spaces.

b3. Criticize alternatives.

b4. Choose among different design alternatives.

c- Professional and practical skills:

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

c1. Create architectural designs that integrate social, aesthetic and technical requirements.

c2. Use appropriate graphic and modeling techniques for representation.

c3. Submit professional good looking complete and integrated drawings.

d- General and transferable skills:

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

d1. Communicate effectively with other people using visual, graphic, written and verbal means.

d2. Work in a self-directed manner.

d3. Work coherently and successfully as a part of a team in projects and assignments.
d4. Manage time and meeting deadlines.
d5. Analyze problems and use innovative thinking in their solution.
d6. Use the Internet in searching for information about specific building types.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Content (Submission Schedule):

#	Items	Weeks	Lectures	Tutorials	Total
1	First sketch design	4th week	-	44	44
2	Second sketch design	6th week	-	22	22
3	Third sketch design	9th week	-	33	33
4	Fourth & Final sketch design	12th week	-	33	33
5	Final Submission & Jury	After the 15th week	-	33	33
Total			-	165	165

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

- Year work: **50%**
  - First Submission: 05%
  - Second Submission: 10%
  - Third Submission: 10%
  - Fourth Submission: 15%
  - Design process progress (Participation) 10%
- Participation & Performance **10%**
- Final Jury: **40%**
  - External Jury 25%
  - Internal Jury 15%

9- List of references:

Recommended Readings:

a) Neufert, Architects' Data.
b) Time Saver Standards, Handbook.
c) Architectural Magazines and Projects.
d) Internet Resources that highlight design concepts of similar projects.

10- Facilities required for teaching and learning:

- Lectures and presentations on different elements and aspects of the design problem, focus is on selected projects of similar building types.
- Discussions of data collected and similar project concepts and analysis.
- Students' suggested site visits to selected projects as well as to similar building types.

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													
		A3	A7	A9	B3	B4	B5	C03	C14	C16	C19	D1	D2	D8	D9
Course ILOs	a1.	●		●											
	a2.	●													
	a3.		●												
	a4.	●		●											
	b1.					●	●								
	b2.					●									
	b3.				●		●								
	b4.				●		●								
	c1.									●	●				
	c2.							●							
	c3.								●						
	d1.											●	●		●
	d2.												●	●	●
	d3.											●	●		●
	d4.														●
	d5.												●	●	
	d6.													●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	d1	d2	d3	d4	d5	d6
First sketch design	●	●		●	●				●	●		●	●	●	●	●	●
Second sketch design	●	●		●	●	●		●	●	●		●	●		●	●	●
Third sketch design	●	●		●	●	●	●	●	●	●		●	●		●	●	●
Fourth & Final sketch design	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	
Final Submission & Jury	●	●	●		●	●	●	●	●	●	●	●	●		●	●	

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	d1	d2	d3	d4	d5	d6
Lectures & presentations	●		●	●	●	●	●		●	●	●				●	●	
Discussions of collected data	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Students' suggested site visits	●		●						●			●		●	●		

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	d1	d2	d3	d4	d5	d6
Research	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
Presentation	●	●	●	●	●	●	●	●		●	●	●		●	●		
Design Sketches	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●
Final Submission & Jury	●	●	●		●	●	●	●	●	●	●	●	●		●	●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 511: Architecture Design (7)
"*Contextual Design*"

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Five –9th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Architecture Design (7) **Code: ARC 511**

Credit Hours:	**4Cr. Hrs.**
Lectures:	**2 Hrs.**
Tutorial:	**6 Hrs.**
Total:	**8 Hrs.**

Prerequisite: Architectural Design 6 (ARC- 412)

B- Professional Information

1- Catalog Course Description:

Visual relations of the group of buildings and their conformity with the general layout and context. The design should comprise major elements having wide structural spans. Provision for natural lighting and ventilation. Application of new technologies to enhance design concepts.

2- Overall aims of the course:

The main aims of this course are to:

- Enhance student's awareness of creative design process within a thematic context that is rich of identity, heritage, social characteristics and traditions.
- Train student to apply architectural strategies for integrating new designs into existing contexts.

3- Intended learning outcomes of course (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.

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information.

A16 Demonstrate knowledge and understanding of the significance of urban spaces and the interaction between human behavior, built environment and natural environment.

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.

B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.

B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.

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

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.

C15 Display imagination and creativity.

C16 Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.

C19 Contribute positively to the aesthetic , architecture and urban identity and cultural life of the community .

D01 Communicate effectively.

D02 Discuss and defend ideas.

D05 Manage tasks and resources

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

D09 Work under stressful environments and within constraints of time and Budget.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define the design process as a particular set of sequential operations.
a2. Define what is meant by design problem.
a3. Distinguish different architectural rendering techniques.

b- Intellectual skills:

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

b1. Use analytical thinking methods to define design problems.
b2. Use creative thinking methods to propose different design alternatives.
b3. Evaluate design alternatives.

c- Professional and practical skills:

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

c1. Design architectural projects in light of spatial and aesthetic requirements.
c2. Apply creative concepts and methods to develop his/her design.
c3. Create 3D sketches to express and develop his/her design.
c4. Use proper presentation techniques to represent his/her final design proposal.

c5. Build simple physical study models.

d- General and transferable skills:

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

d1. Express his/her ideas by visual, graphic, written and verbal means

d2. Discuss and defend his/her ideas.

d3. Manage time and meet deadlines.

d4. Search for relevant information.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

#	Topics	Lec.	Tut.	Tot.
1	Projects data collection, site visits and data review	6 hrs.	18 hrs.	24 hrs.
2	Projects data collection, site visits and data review			
3	Projects data collection, site visits and data review			
4	Data Analysis	4 hrs.	12 hrs.	16 hrs.
5	Data Analysis			
6	Two pre-presentations of research work	8 hrs	24 hrs	32 hrs.
7	Two pre-presentations of research work			
8	Two pre-presentations of research work			
9	Two pre-presentations of research work			
10	Development and follow up	2 hrs.	6 hrs.	8 hrs.
11	Development and follow up	2 hrs.	6 hrs.	8 hrs.
12	Development and Follow up	2 hrs.	6 hrs.	8 hrs.
13	Final presentation, finishing and representation of researches	2 hrs.	6 hrs.	8 hrs.
14	Final presentation, finishing and representation of researches	2 hrs.	6 hrs.	8 hrs.
15	Final presentation, finishing and representation of researches	2 hrs.	6 hrs.	8 hrs.
Total		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%
- Work year :
  - Mid-term submission(s) : 20%
  - Homework assignments : 20%
  - Sketch design : 10%
- Participation : 10%
- **Total 100%**

9- List of references:

1. Text Book:

Author	Title	Year/ Edition	Publisher
Reid Ewing and Otto Clemente	**Measuring Urban Design Metrics for Livable Places**	Second edition,Arthur C. Nelson and Reid Ewing,2013	Island Press, 2000 M St. NW Suite 650, Washington, DC 20036

2. Reference:

Author	Title	Year/ Edition	Publisher
Ramsey, C.; Ray, J. & Hoke, Jr.	**Architectural Graphic Standards**	Tenth Edition, AIA. John Wiley & Sons Inc., 2000, NJ. USA	AIA. John Wiley & Sons Inc.
Francis D.K. Ching	**Form – Space and Order**	Third Edition , John Wiley & Sons Inc., 2007 , NJ. USA	John Wiley & Sons Inc.
The Alden Group Ltd.	**Neufert, E.: Architects' Data; The Handbook of Building Types**	2002 Third Edition	Blackwell Publishing
Chiara, J.	**Time Saver Standards for Architectural Design**	Seventh Edition , Donald Watson ,Michael J.Crosbie . John Hancod ,1997,USA.	Donald Watson ,Michael J.Crosbie John Hancod

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data show for presentations
- Architectural Library
- Internet connection

Course coordinator: **Prof. Dr. Osama Mohamed El-Rawi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November / 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILO Matrix

Course ILOs	Program ILOs: A 03	A 07	A 09	A 10	A 16	B 02	B 03	B 04	B 13	B 15	C 03	C 14	C 15	C 16	C19	D 01	D 02	D 05	D 08	D 09
a1.	●	●	●																	
a2.				●	●															
a3.	●				●															
b1.						●			●	●										
b2.						●	●	●												
b3.						●			●	●										
c1.											●		●	●	●					
c2.											●	●	●	●						
c3.											●	●		●						
c4.											●		●							
c5.											●		●							
d1.																●				
d2.																	●			
d3.																		●		●
d4.																			●	

Table [2]: Course Context/ILO Matrix

Topic	a1	a2	a3	b1	b2	b3	c1	c2	c3	c4	c5	d1	d2	d3	d4
Projects data collection, site visits	●	●		●				●						●	●
Data Analysis	●	●		●			●	●						●	●
pre-presentations of research work		●	●	●	●	●	●	●	●	●		●	●	●	●
Development and follow up	●	●	●	●	●	●	●	●	●	●		●	●		●
Representation of researches										●	●				
Review, presentations	●			●		●								●	●

Table [3]: Teaching Method/ILO Matrix

Teaching Method	a1	a2	a3	b1	b2	b3	c1	c2	c3	c4	c5	d1	d2	d3	d4
Lecture	●	●	●	●	●										
One to One Discussion	●	●	●	●	●	●	●	●	●	●	●	●	●		
Small Groups Discussion		●	●	●	●	●	●	●	●	●		●	●		
Public Group Discussion	●	●	●	●	●	●	●	●	●	●		●	●		
Physical Maquette										●	●				
Search for Data (Self-study)	●			●		●								●	●
Research Presentation										●		●	●	●	
Sketch Designs			●	●	●	●	●	●	●	●		●		●	

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	b1	b2	b3	c1	c2	c3	c4	c5	d1	d2	d3	d4
Research Document		●		●		●									●
participation	●	●	●	●	●	●						●	●	●	●
Sketch Designs			●			●			●	●		●		●	
Physical Maquette											●				
Final project			●			●	●	●	●	●		●		●	
Final exam	●		●		●		●	●	●	●		●		●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 551: Urban Planning (2)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Five - 9th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Urban Planning 2 **Code: ARC 551**
Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: ARC 451 Urban Planning I

B- Professional Information

1- Catalog Course Description:

The course introduces the concepts of regional development and planning as the largest scale of planning practice. The students also get to know the principles of urban transformation and the causes for such transformations. The students are invited to apply the gained knowledge through actual project(s) within the Egyptian context, with the aim of formulating a strategic regional plan for a selected region in Egypt. This is to be followed by learning how to make a structural plan for a medium sized city within the scope of the regional plan.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1- Understand the meaning and causes of urban transformation.
2- Understand the concepts of regional development.
3- Learn the process of strategic regional planning.
4- Identify urban, social, political, economic and environmental problems
5- Relate and connect socio-cultural, socio-political, socio-economic issues to urbanism
6- Use computer applications and contemporary software in data presentation
7- Work in teams (team work)
8- Share ideas and communicate with others

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A03 Demonstrate knowledge and understanding of the principles and theories of urban deterioration and, as process and product.
A04 Demonstrate knowledge and understanding of history of architecture, urban, and regional planning across different eras.
A09 Demonstrate understanding and appreciation to the social, environmental, ethical, and economic consideration and human factors affecting the exercise of the architectural decisions. .
A15 Demonstrate knowledge and understanding of the processes of spatial change in the built and natural environments; patterns and problems of cities, and positive and negative impacts of urbanization.
B02 Compare, analyze and criticize different engineering problems and case studies, evaluate design alternatives and conclude results based on analytical thinking
B07 Incorporate different dimensions of economy, society, environment, technology, applicability, safety, site constraints, urban context and risk management in design.
B10 Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.
B12 Integrate community design parameters into design projects.

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.
C16 Respect all alternative solutions, changes in original plan of the project, differences in style, culture, experience and treat others with respect.
C18 Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.

D01 Communicate effectively.
D02 Discuss and defend ideas.
D05 Manage tasks and resources
D07 Work Coherently as a part of a multidisciplinary team.

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. Review the basic principles of Regional Planning and its methodology
a2. Differentiate between the different levels of planning
a3. Illustrate the concept of urban transformation and its relation to planning
a4. Interpret the concepts, and location of new settlements

b- <u>Intellectual skills:</u>

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

b1. Analyze the region in existing and new developments, assess and evaluate its elements and components
b2. Suggest alternative solution and locations for new developments on the regional level
b3. Analyze urban, social, political, economic assets and problems in the region and relate them to regional planning
b4. Propose designs for new cities and settlements

c- <u>Professional and practical skills:</u>

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

c1. Originate the causes of urban transformation
c2. Indicate the level of development within a specific region through given data

c3. Integrate the different spatial and environmental issues in a region to produce a good plan.
c4. Plan new cities and strategies

d- General and transferable skills:

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

d1. Discuss and defend his/her ideas.
d2. Work in a team from the beginning of the project to its end.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

#	Topics	Lectures	Tutorial	Total
1	Introduction to Urban Transformation	2	2	4
2	Mini project announcement: Urban transformation of Downtown Cairo	2	2	4
3	Regional Development Strategies	2	2	4
4	Planning of the Halayeb triangle in Egypt/ impacts of politics on the development of non-core regions in Egypt	2	2	4
5	1st Midterm Presentation: Submission of the Mini Project	2	2	4
6	Introduction to the regional planning project	2	2	4
7	Analyzing the present situation of the region / case study : Nubia Region	2	2	4
8	Identifying the Problems / Constraints and potentials – SWOT analysis	2	2	4
9	2nd Midterm presentations	2	2	4
10	Developing the regional upgrading strategy	2	2	4
11	Developing different planning proposals	2	2	4
12	The Regional Master Plan	2	2	4
13	Structural Planning of a new Settlement (1)	2	2	4
14	Structural Planning of a new Settlement (2)	2	2	4
15	Final presentation and end work	2	2	4
Total		30	30	60

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%
  - Written Exam 40 %
- Year work:
  - First Mid Term Exam 25%
    - Quizzes 5 %
    - 1st Submissions 10%
    - 2nd Submissions 10 %
  - Second Mid Term Exam 25%

- 1st Submissions 10 %
- 2nd Submissions 10 %
- Quiz 5 %

o Participation ..... 10 %

Total **100%**

9- List of references:

- American planning Association, Planning and urban design standards, Wiley, 2006.

- Recommended books

- EL.Wakil, S., Urban Planning: Principle, Basics & Applications, Cairo, 2006.
- Hall, P. Urban and Regional planning, Routledge , 2010
- Weber, R. and Randal, C, The oxford handbook of urban planning, Oxford, 2015.

- Periodicals, Web sites, etc.

- Town planning review
- Journal of urban planning and development
- **http://www.planning.org/planning/**

10- Facilities required for teaching and learning:

- White board
- Computer and Data show for presentations
- Architectural Library
- Internet connection

Course coordinator: **Assoc. Prof. Dr. Yehya M. Serag**
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	A04	A09	A15	B02	B07	B10	B12	C14	C16	C18	D01	D02	D05	D07
Course ILOs	a1.	●	●													
	a2.	●	●		●											
	a3.			●	●											
	a4.		●		●											
	b1.					●	●									
	b2.					●	●	●								
	b3.						●									
	b4.						●	●	●							
	c1.										●					
	c2.									●						
	c3.									●		●				
	c4.									●	●	●				
	d1.														●	
	d2.												●	●		●

Table [2]: Course Content/ILO Matrix

Course Content	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
Introduction to Urban Transformation			●				●		●		●			
Urban transformation of Downtown Cairo			●				●		●		●		●	●
Regional Development Strategies	●	●		●	●	●	●			●	●			
Planning of the Halayeb triangle in Egypt/ impacts of politics on the development of non-core regions in Egypt		●		●	●		●			●	●	●		
1st Midterm Presentation: Submission of the Mini Project													●	
Introduction to the regional planning project		●								●	●			
Nubia Region					●			●		●	●		●	●
Identifying the Problems SWOT analysis					●			●		●			●	●
2nd Midterm presentations													●	
Developing the regional upgrading strategy	●			●		●				●		●	●	
Developing different planning proposals		●			●			●			●	●	●	
The Regional Master Plan	●	●		●		●		●			●		●	
Structural Planning of a new Settlement (1)				●				●				●	●	
Structural Planning of a new Settlement (2)				●				●				●	●	
Final presentation and end work													●	

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
Lecture	●	●	●	●	●		●				●	●		
Applied Projects			●		●	●	●	●	●	●	●	●	●	●
Search for Data (Self-study)			●						●	●				
Project Presentations													●	

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
Intermediate projects presentations	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Final project presentation & oral exam	●	●		●	●	●		●		●	●	●	●	
Quiz	●						●							
Final exam	●	●		●	●	●								

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 552: Urban Design & Housing (2)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Five – 9th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Urban Design & Housing (2) **Code: ARC 552**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite: ARC 452 Urban Design & housing (1)

B- Professional Information

1- Catalog Course Description:

This course introduces the students to working with complex and large scale urban design projects, while taking into consideration the socio-economic contextual factors. In connection to this the course also introduces the students to different types of housing types (public housing, incremental housing, sites and services, etc..) and the how they can be de developed through a given methodology that starts with site analysis, site planning to the development of the housing cluster and housing typologies.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Develop a proper site analysis and planning.
- Identify the role of the socio-economic and contextual aspects in the project design.
- Differentiate between the different types of housing projects and typologies.
- Enumerate the reasons for contemporary urban design problems.
- Develop an appreciation of the importance of open design in city design.
- Develop a program for a specific project given certain variables.
- Devise plans for projects in new locations or in old existing ones.
- Analyze the urban fabric in existing developments.
- Design and evaluate alternative solutions.

3- Intended learning outcomes of course (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.
A09 Demonstrate understanding and appreciation to the social, environmental, ethical and economic considerations and human factors affecting the exercise of the architectural decisions
A15 Demonstrate knowledge and understanding of the processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.
A16 Demonstrate knowledge and understanding of the significance of urban spaces and the interaction between human behavior, built environment and natural environment.
A18 Demonstrate knowledge and understanding of various dimensions of housing problem and the range of approaches, policies, and practices that could be carried out to solve this problem.
B02 Compare, analyze and criticize different engineering problems and case studies, evaluate design alternatives and conclude results based on analytical thinking
B04 Explore and think of design forms in two and three dimensions engaging images of places and time with innovation and creativity
B10 Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.
B12 Integrate community design parameters into design projects.
B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.
C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.
C15 Display imagination and creativity
C16 Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.
C19 Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.
D01 Communicate effectively.
D02 Discuss and defend ideas.
D05 Manage tasks and resources

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

By the end of this course the student should maintain proficiency level at:
a1 Identifying the impacts of the socio-economic aspects on urban design and housing projects.
a2 Recognizing urban design element for the new development projects.
a3 Pointing different elements of the built environment.
a4 Outlining different housing principles, levels and prototypes.

b- <u>Intellectual skills:</u>

By the end of this course the student should maintain of proficiency level at:
b1 Applying the design process throughout the project.
b2 Analyzing data on different levels
b3 Assessing existing urban design projects and elements of the built environment
b4 Suggesting and evaluating alternative urban design and housing settings

c- <u>Professional and practical skills:</u>

By the end of this course the student should maintain proficiency level at:

C1 Constructing project out line.
C2 Specifying problems with great complexity.
C3 Designing alternative solutions to large scale urban design and housing projects that integrate different social and cultural variables and encompass all scales of environmental design.
C4 Judging the applications of contemporary tools and approaches to urban design and housing problems.

d- General and transferable skills:

By the end of this course the student should maintain proficiency level at:
d1 Presenting projects and data using different techniques (computer, manual… etc.).
d2 communicating effectively with others.
d3 Representing the work using common techniques and tools.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

#	Course Content	Lec.	Tut.	Total
1	Cases of large scale urban design projects	2	2	4
2	Urban spaces and enclosure	2	2	4
3	Urban accessibility and road networks	2	2	4
4	Urban Character & Visual aspects in large urban design and housing projects.	2	2	4
5	The housing problem in Egypt. / Housing typologies	2	2	4
6	Mid-term (1) and 1st submission and follow up	2	2	4
7	Housing : Types of Housing ; clustering and grouping	2	2	4
8	Housing Regulations	2	2	4
9	Project Master Plan and Study Model (follow up)+ details and urban sections & elevations (follow up)	2	2	4
10	Landscape Architecture for large urban design projects.	2	2	4
11	Mid-term (2) / 2nd submissions and follow up of all staff comments	2	2	4
12	Examples on public housing	2	2	4
13	Examples on incremental housing	2	2	4
14	Project: Master Plan and Study Model(follow up)+ details and elevations (follow up)	2	2	4
15	Project Final submission and discussion	2	2	4
Total		30	30	60

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%
- Year work: 50%
  - In Class Quizzes 20%
  - Assignments/Studio work 30%
- Participation 10%

9- List of references:

1. Text Book:

Carmona, Matthew, Taner Oc. Et all, Public Places - Urban Spaces: The Dimensions of Urban Design, Boston : Architectural Press, (2003).

2. Students Lecture Notes

3. Handouts

4. Recommended Readings:

[1] Bentley, Alcock, Murrain, Mcglynn, and Smith, Responsive Environments, A Manual for designer, Butterworth Architecture, (1985).
[2] Gosling, David, Gordon Cullen: Visions of Urban Design, Academy Editions, (1996)
[3] Llewelyn-Davies, Urban Design Compendium, English Partnerships, The Housing Corporation, First Published (2000).
[4] Moughtin. Cliff. ET, Urban Design; Method and Techniques, Architectural Press. (1999).
[5] Moughtin. Cliff. ET, Urban Design; Street and Square, Third Edition, , Architectural Press. (2003).
[6] Moughtin. Cliff. ET, Peter Shirley, Urban Design; Green Dimensions, Second Edition, Architectural Press. (2005).
[7] Fleming, John, ET. Al., the Penguin Dictionary of Architecture and Landscape Architecture, the Penguin Group, Fifth Edition, (1998)
[8] Alexander, Christopher, A. Neis, H. Anninou, A., and King, I., A New Theory of Urban Design, Oxford: Oxford University Press, (1987)
[8] Brolin, Brent. Architecture in Context. Fitting New Buildings with Old, Van Nostrand Reinhold Company. N.Y., USA. (1980).
[9] Gosling, David. Et. Al., Concepts of Urban Design, Academy Editions. Martin's Press. London. Britain. (1984)
[10] Krier, Robert, Urban Space, Academy edition, Rizzoli, New York, (1979).
[11] Jon Lang (2005), URBAN DESIGN :A TYPOLOGY OF PROCEDURES AND PRODUCTS, Illustrated with over 50 Case Studies, the Master in Urban Development

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Data show for presentations
- Architectural Library

Course coordinator: **Assoc. Prof. Dr. Yehya M. Serag**
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	A09	A15	A16	A18	B02	B04	B10	B12	B15	C14	C15	C16	C19	D01	D02	D05
Course ILOs	a1.	●	●															
	a2.	●		●														
	a3.			●	●													
	a4.				●	●												
	b1.																	
	b2.						●			●								
	b3.						●		●									
	b4.							●			●							
	c1.											●						
	c2.											●						
	c3.												●	●				
	c4.														●			
	d1.															●		
	d2.																●	●
	d3.																●	●

Table [2]: Course Content/ILO Matrix

Course Content	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Cases of large scale urban design projects	●	●													
Urban spaces and enclosure		●	●			●			●	●				●	●
Urban accessibility and road networks		●	●			●			●	●				●	
Urban Character and Visual aspects in large urban design and housing projects.		●	●			●			●	●	●		●		●
The housing problem in Egypt. / Housing typologies		●	●			●				●	●		●		●
Mid-term (1) and 1st submission and follow up	●	●	●	●	●	●	●		●	●	●	●	●	●	●
Housing : Types of Housing ; clustering and grouping	●			●	●		●	●				●			●
Housing Regulations	●		●		●			●		●		●			●
Project Master Plan and Study Model (follow up)+ details and urban sections & elevations (follow up)	●		●		●			●				●			●
Landscape Architecture for large urban design projects.	●			●	●	●	●	●		●	●	●	●		
Mid-term (2) / 2nd submissions and follow up of all staff comments	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Examples on public housing	●	●	●		●			●		●	●				
Examples on incremental housing		●	●		●		●	●		●		●			●
Project: Master Plan and Study Model(follow up)+ details and elevations (follow up)		●	●		●		●	●				●	●		●
Project Final submission and discussion	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [3]: Learning method/ ILOs

Learning method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Lecture	●	●	●	●											
Research	●	●	●	●							●	●	●	●	●
Class Work					●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Presentations	●	●										●	●	●	●
Final and Pre Final Project			●						●	●	●	●			
Sketch Design			●		●	●	●	●	●	●	●	●			
Midterm & Final Examination			●		●			●		●	●				

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 571: Execution Designs (3)

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Five – 9th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Execution Design (3) **Code: ARC 571**

Credit Hours:	**4 Cr. Hrs.**
Lectures:	**2 Hrs.**
Tutorial:	**4 Hrs.**
Total:	**6 Hrs.**
Prerequisite:	ARC 472: Execution Designs (2)

B- Professional Information

1- Catalog Course Description:

The main concern of this course will be the integration of complex multi-disciplinary issues. In addition, students will practice how to survey different quantities of construction/building items. The practice will be on a moderate scale complex projects. In addition these topics will be discussed; Analysis of bids, Cost analysis, Shop and as built drawings.

Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Demonstrate an entire set of integrated execution documents for projects presenting a complete architectural project with emphasis on structural, construction and technical working details.
- Address areas like preparation of integrated execution documents for projects, Quantity surveying, Analysis of bids, Cost analysis, Shop and as built drawings .
- Produce advanced Quantity surveying documents for projects.

2- Intended Learning Outcomes (ILOs)

3.1. Program ILOs related to course:

A02 Demonstrate knowledge and understanding of the basics of information and communication technology (ICT).

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

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

A11 Demonstrate knowledge and understanding of building regulations and legislations in practicing architecture as well as administration and management principles relevant to engineering in general and architecture in particular.

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline

A17 Demonstrate knowledge and understanding of the role of the architecture profession relative to the construction industry and the overlapping interests of organizations representing the built environment

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

B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.

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

C05 Prepare and present technical reports, working drawings, and construction documents for design projects

C09 Demonstrate project construction administration and management skills.

C13 Use appropriate construction techniques and materials to specify and implement different designs.

D05 Manage tasks and resources.

D09 Work under stressful environments and within constraints of time and budget.

D11 Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. Identify the measuring units of each item of Quantity surveying.
a2. Identify the process of making; analysis of bids, and cost analysis.
a3. Identify the importance of shop drawings & as built drawings.

b- <u>Intellectual skills:</u>

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

b1. Formulate problem solutions related to integrated execution & Quantity surveying

documents.
b2. Choose optimum solutions for preparation of Quantity surveying of a pre-designed project.
b3. Choose optimum software of Quantity surveying according to different cases.

c- Professional and practical skills:

By the end of this course the student should be able to:
c1. Apply manual & digital techniques to conduct Quantity surveying documents for a project.
c2. Apply new techniques used in Cost analysis.

d- General and transferable skills:

By the end of this course the student should be able to:
d1. Work in team work research.
d2. Communicate effectively with others.

3- Course ILOs versus Program ILOs relation

See Appendix, table [1]

4- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Introduction to Preparation of integrated execution documents for projects	2	4	6
2	Preparation of working drawings of a pre-designed project	2	4	6
3	integration of complex multi-disciplinary issues	2	4	6
4	Introduction to Quantity surveying	2	4	6
5	Survey different quantities of construction/building items – Manual Method	4	8	12
6	Midterm Exam , Revision	2	4	6
7	Survey different quantities of construction/building items – Using AutoCad Software & Excel Sheets	2	4	6
8	Introduction to Quantity surveying in Revit software	2	4	6
9	Analysis of bids & Cost analysis	2	4	6
10	Shop drawings & As built drawings	2	4	6
11	Practical Quantity surveying	4	8	12
12	Final Quantity surveying project	4	8	12
Total		30	60	90

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

5- Learning / Teaching Methods:

See Appendix, Table (3)

6- ILOs Teaching & Assessment Method

See Appendix, Table (4)

7- Weighting of assessments

- Final exam: 40%
- Year's work: 50%
  - Midterm 1 15%
  - Midterm 2 15%
  - Assignments/Lab work 20%
- Participation 10%

8- List of references:

1. Text Book:
   - Slitt; Fred. **Working Drawing manual**, 1998, McGraw Hill
   - Allen; Edward, Iano; Joseph. **Fundamentals of Building Construction: Materials and Methods**, John Wiley & Sons, 2011
2. Students Lecture Notes
3. Handouts

9- Facilities required for teaching and learning:

- Lecture Hall
- White board
- Computer & Data show for presentations
- Internet Connection
- Computer Labs

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafar**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs																
		A02	A06	A07	A09	A11	A12	A17	B03	B06	B11	C01	C05	C09	C13	D05	D09	D11
Course ILOs	a1.					●	●											
	a2.	●			●	●	●											
	a3.		●	●				●										
	b1.								●		●							
	b2.								●									
	b3.									●								
	c1.											●		●				
	c2.												●		●			
	d1.															●		
	d2.																●	●

Table [2]: Course Content/ Course ILO Matrix

Topic	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Introduction to Preparation of integrated execution documents for projects	●	●								
Preparation of working drawings of a pre-designed project			●	●		●				●
integration of complex multi-disciplinary issues			●							
Introduction to Quantity surveying	●									
Survey different quantities of construction/building items – Manual Method				●	●		●		●	
Survey different quantities of construction/building items – Using AutoCad Software & Excel Sheets				●	●	●	●			
Introduction to Quantity surveying in Revit software	●		●			●	●			
Analysis of bids & Cost analysis		●		●		●		●		
Shop drawings & As built drawings			●							●
Practical Quantity surveying				●	●	●	●		●	●
Final Quantity surveying project				●	●	●	●			●

Table [3]: Learning Method/ILO Matrix

Teaching Method	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Lecture	●	●	●				●	●		●
Lap Work			●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Assignment	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC 581: Project Management and Feasibility Studies

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Five - 10th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Project Management and Feasibility Studies **Code: ARC 581**

Credit Hours:	**2 Cr. Hrs.**
Lectures:	**2 Hrs.**
Tutorial:	**1 Hrs.**
Total:	**3 Hrs.**

Prerequisite: As Advised

B- Professional Information

1- Catalog Course Description:

Introduction to project management and feasibility studies. Principles of project life cycle, role and activity of a manager, project breakdown structure, economic analysis of projects, interest and time value of money, discounted cash flow, evaluation of projects, Project time programming and control.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1- Prepare the economic analysis of the construction projects.
2- Prepare the time schedule for different projects.
3- Update the project schedule in different intervals.
4- Construct the resources allocations and leveling.
5- Construct the project cash flow.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information

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

C09 Demonstrate project construction administration and management skills.

D01 Communicate effectively

D04 Deal with others according to the rules of the professional ethics

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define the concept of "Project Management".
a2. Identify the meanings of project phases: Design, Construction Planning, execution.
a3. Identify different approaches of "construction planning".
a4. Identify different problem types that the project may face in its different phases.
a5. Explain the importance of project finance/profit analysis for the feasibility study of project construction.

b- Intellectual skills:

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

b1. Analyze the project financial problems.
b2. Criticize case studies.
b3. Evaluate the economic value in construction projects.
b4. Derive different methods of planning and scheduling techniques.

c- Professional and practical skills:

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

c1. Write updating reports during construction stages.
c2. Use appropriate techniques for planning construction schedules.
c3. Prepare W.B.S and network plan.

d- General and transferable skills:

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

d1. Write reports.
d2. Deal with colleagues according to professional ethics

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

#	Topic	Lec.	Tut.	Tot.
1	Introduction.	2	1	3
2	economic analysis	4	2	6
3	Planning and scheduling of construction projects using Bar chart	4	2	6
4	Planning and scheduling techniques	4	2	6
5	Principals of feasibility studies.	4	2	6
6	Programming of projects using network techniques	4	2	6
7	Project up-dating and control	6	3	9
8	Revision	2	1	3
Total				

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%
- Year's work: 50%
  - Midterms 30%
  - Assignments 20%
- Performance & Participation 10%

9- List of references:

1- Text Book:
Ronald Mccaffer , Frank Harris & Francis Edum-Fotwe, **Modern Construction Management**, Sixth Edition, Blackwell Publishing

10- Facilities required for teaching and learning:

- White board
- Computer & Data show for presentations
- Internet Connection
- Architectural Library

Course coordinator: **Assistant Prof. Dr. Tamer Samir**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs						
		A06	A10	B02	B03	C09	D01	D02
Course ILOs	a1.	●						
	a2.	●						
	a3.	●						
	a4.	●						
	a5.		●					
	b1.				●			
	b2.			●				
	b3.				●			
	b4.			●				
	c1.					●		
	c2.					●		
	c3.					●		
	d1.						●	
	d2.							●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	b1	b2	b3	b4	c1	c2	c3	d1	d2
economic analysis	●			●	●	●		●	●					
Planning and scheduling of construction projects	●	●	●				●	●	●		●	●		●
Planning and scheduling techniques	●	●	●				●	●	●		●	●	●	
Principals of feasibility studies.	●	●	●		●									
Programming of projects using network techniques	●	●	●				●			●	●	●		
Project up-dating and control							●	●		●		●	●	

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	a5	b1	b2	b3	b4	c1	c2	c3	d1	d2
Lecture	●	●	●	●	●	●		●	●	●				
Assignment					●	●	●	●		●	●	●	●	
Group discussion														●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	a5	b1	b2	b3	b4	c1	c2	c3	d1	d2
Assignment					●	●	●	●	●	●	●	●	●	
Observation checklist														●
Midterm & Final Exam	●	●	●	●	●	●		●	●	●				

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E01: Computer Applications for Architects (1)
Departmental Elective course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level three / 5th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Computer Applications for Architects (1) **Code: ARC E01**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite:
As Advised

B- Professional Information

1- Catalog Course Description:

Computer as a tool designed for change: Computer aided drafting, Creation and editing of primitives – Accuracy – Organization – 2D and 3D drawing.
Computer aided Design: Modeling, and Visualization. Architectural rendering: Scenes, Materials and mapping. Using Photo editing applications in Architectural rendering.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Use computer simple drafting software to visualize architecture projects in 2D digital forms, by the aid of programs such as “AutoCAD”.
- Use computer rendering programs to produce raster graphics by the aid of programs such as “Photoshop”.
- Use computer modeling software to visualize architecture projects in 3D digital forms, make 3D & 2D rendered graphics by the aid of programs such as “Revit”.

3- Intended Learning Outcomes (ILOs)

3.1. Program ILOs related to course:

A02 Demonstrate knowledge and understanding of the basics of information and communication technology (ICT).

A08 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques.

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

B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.

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

C06 Use appropriate computer programs in engineering and architectural works.

C07 Build architectural physical and computer models.

D03 Demonstrate efficient IT capabilities.

D05 Manage tasks and resources.

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

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Identify different architectural computer drafting, modeling, rendering, and presentation techniques.

a2. Define Characteristics of raster & vector graphics.

a3. Identify different types of textures and materials.

a4. Identify the different uses of 2D & 3D computer interfaces.

b- Intellectual skills:

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

b1. Visualize graphical forms in two and three dimensions.

b2. Differentiate between raster and vector graphics.

b3. Choose proper tools for modeling, rendering, and presenting architectural projects.

b4. Choose proper blocks, families, textures, and materials.

c- Professional and practical skills:

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

c1. Prepare 2D, 3D, and rendered drawings and presentations.

c2. Use Photoshop software in assigning materials and furniture layers into architectural plans & Elevations.

c3. Build architectural digital models using Revit software.

d- General and transferable skills:

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

d1. Do simple Search for information.

d2. Manage time to meet deadlines.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Introduction to Computer applications in Architecture.	2	2	4
2	Introduction to AutoCAD	2	2	4
3	Drawing & Editing Commands in AutoCad	8	8	16
4	Photoshop 2D Architectural Presentations.	4	4	8
5	Introduction to BIM, & Revit	2	2	4
6	3D Drawing & Editing Commands in Revit Software	8	8	16
7	3D Modelling for a Building (Final Project)	4	4	8
Total		30	30	60

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%
- Year's work:
  - Midterm 1 15%
  - Midterm 2 15%
  - Assignments/Lab work 20%
  - Participation 10%

9- List of references:

1. Text Book:
   Manual of AutoCAD 2014, PhotoShop, & Revit Software 2017.
   Help Menu of AutoCAD 2014, PhotoShop, & Revit Software 2017.
2. Students Lecture Notes
3. Handouts

10- Facilities required for teaching and learning:

- Lecture Hall
- White board
- Computer & Data show for presentations
- Internet Connection
- Computer Labs

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafer**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

Course ILOs	Program ILOs: A02	A08	B04	B06	C03	C06	C07	D03	D05	D08
a1.		●								
a2.	●									
a3.		●								
a4.		●								
b1.			●							
b2.				●						
b3.			●							
b4.			●							
c1.						●	●			
c2.						●				
c3.					●	●	●			
d1.								●	●	
d2.									●	●

Table [2]: Course Content/ Course ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	d1	d2
Introduction to Computer applications in Architecture.	●						●						
Introduction to AutoCAD	●	●			●	●							
Drawing & Editing Commands in AutoCad				●			●	●	●			●	●
Photoshop 2D Architectural Presentations.	●	●				●		●		●		●	●
Introduction to BIM, & Revit		●					●				●		
3D Drawing & Editing Commands in Revit Software	●		●	●			●	●	●		●	●	●
3D Modelling for a Building (Final Project)			●	●			●	●	●		●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	d1	d2
Lecture	●	●	●	●		●		●			●		
Lab Work	●		●	●	●		●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	d1	d2
Assignment	●	●	●	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●	●	●

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Department of Architectural Engineering

Course Specifications

ARC E02: Computer Applications for Architects (2)
Departmental Elective course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level three / 5th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Computer Applications for Architects (2) **Code: ARC E02**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite:
As Advised

B- Professional Information

1- Catalog Course Description:

3D Computer modeling using Sketchup, Assigning Sketcup materials to masses, Assigning Sketchup lighting properties, Adding components, Assigning shots and saving them, surface rendering in variable "styles", Animations & settings. Using Vray for materials and lighting, Using Vray renderer. Rendering, Animations, and Presentations using LUMION 5 Software.

Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Use computer simple modeling software to visualize architecture projects in 3D digital forms, make 3D animations & 2D rendered graphics by the aid of programs such as “Sketchup” & "Vray".
- Use computer rendering programs to produce professional Scenes, renderings, and professional animations by the aid of programs such as “LUMION 5”.

2- Intended Learning Outcomes (ILOs)

3.1. Program ILOs related to course:

A02 Demonstrate knowledge and understanding of the basics of information and communication technology (ICT).

A08 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques.

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

B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.

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

C06 Use appropriate computer programs in engineering and architectural works.

C07 Build architectural physical and computer models.

D03 Demonstrate efficient IT capabilities.

D05 Manage tasks and resources.

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

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Identify different architectural computer modeling, simulation, rendering, animation, and presentation techniques.

a2. Identify different types of lighting and materials.

a3. Identify the different uses of 2D & 3D computer interfaces.

b- Intellectual skills:

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

b1. Visualize graphical forms in three dimensions.

b2. Choose proper tool for modeling, simulation, rendering, animation, and presenting architectural projects.

b3. Choose proper components, lighting features, and materials.

c- Professional and practical skills:

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

c1. Build architectural digital models using Sketchup software.

c2. Prepare 2D, 3D, and rendered drawings and animations.

d- General and transferable skills:

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

d1. Do simple Search for information.

d2. Manage time to meet deadlines.

3- Course ILOs versus Program ILOs relation

See Appendix, table [1]

4- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Introduction to Sketchup.	2	2	4
2	Importing CAD to Sketchup.	2	2	4
3	Modeling using Sketchup.	8	8	16
4	Adding Components and Materials.	6	6	12
5	Animations using Sketchup.	2	2	4
6	Assign Lighting and Rendering via Vray.	2	2	4
7	Rendering, Animations, and Presentations using LUMION 5 Software.	8	8	16
Total		30	30	60

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

5- Learning / Teaching Methods:

See Appendix, Table (3)

6- ILOs Teaching & Assessment Method

See Appendix, Table (4)

7- Weighting of assessments

- Final exam: 40%
- Year's work:
  - Midterm 1 15%
  - Midterm 2 15%
  - Assignments/Lab work 20%
  - Participation 10%

8- List of references:

1. Text Book:
   Manual of Sketchup 2015, VRay, & Lumion5 Software 2015.
   Help Menu of Sketchup 2015, VRay, & Lumion5 Software 2015.
2. Students Lecture Notes
3. Handouts

9- Facilities required for teaching and learning:

- Lecture Hall
- White board
- Computer & Data show for presentations
- Internet Connection
- Computer Labs

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafer**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs									
		A02	A08	B04	B06	C03	C06	C07	D03	D05	D08
Course ILOs	a1.		●								
	a2.		●								
	a3.	●	●								
	b1.			●							
	b2.			●	●						
	b3.			●	●						
	c1.					●					
	c2.						●	●			
	d1.								●	●	
	d2.									●	●

Table [2]: Course Content/ Course ILO Matrix

Topic	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Introduction to Sketchup	●		●	●			●			
Importing CAD to Sketchup.										●
Modeling using Sketchup.			●	●	●		●	●		●
Adding Components and Materials.		●			●	●	●	●	●	●
Animations using Sketchup.	●				●					
Assign Lighting and Rendering via Vray.		●			●	●	●	●	●	●
Rendering & Animations using LUMION 5 Software.			●	●				●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Lecture	●	●	●			●				
Lab Work	●	●	●	●	●		●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Lab Work	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E03: Interior Design
Departmental Elective course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level three / 5th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Interior Design **Code: ARC E03**

Credit Hours:	**3 Cr. Hrs.**
Lectures:	**2 Hrs.**
Tutorial:	**2 Hrs.**
Total:	**4 Hrs.**

Prerequisite:
As Advised

B- Professional Information

1- Catalog Course Description:

Credit Hours: 3

The course presents creative and practical skills and covers both domestic and commercial interior design. Colors and materials, lighting, finishes details, furnishings and texture in spaces are important issue in the course.

2- Overall aims of the course:

By the end of the course the following overall aims should be achieved:

- Extending the knowledge about principles of interior design, and methodologies of solving interior design problems.
- Enriching the knowledge about building structures and construction methods, properties of materials and the way they may influence interior design decisions.
- Developing the ability to think innovatively considering the integration between different forms of knowledge and ideas from other disciplines in addition to humanitarian interests.

- Evolving proficiency in dealing with alternative solutions, changes in original plans, differences in styles and cultures.
- Enhancing the ability to think three dimensionally, displaying imagination and creativity.

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.

A10 Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information.

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.

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions.

B10 Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.

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.

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.

C15 Display imagination and creativity.

D01 Communicate effectively.

D02 Discuss and defend ideas.

D11 Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. Define the term "Interior Space".
a2. Identify the elements that shape interior space.
a3. Define the term "Interior Design".
a4. Select the suitable type of drawing.
a5. Identify kinds of lighting and acoustics.
a6. List building elements and finishing materials.
a7. Name elements of furnishings and accessories.

b- <u>Intellectual skills:</u>

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

b1. Analyze user activity and furnishing requirements to prepare an adequate interior design program.
b2. Plan interior spaces usage.
b3. Compare choices of interior design elements, finishing, furnishings and accessories.

b4. Justify decisions about choices of design elements.
b5. Manipulate conditions of outer space efficiently.

c- Professional and practical skills:

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

c1. Sketch space planning.
c2. Relate different elements of interior design to design a coherent interior space.

d- General and transferable skills:

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

d1. Use graphical means to communicate effectively.
d2. Use Internet and other data sources to search for information.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

#	Topic	Lecture	Tutorial	Total
1	Introduction: Interior design process	2 hrs.	2 hrs.	4 hrs.
2	Project Introduction	2 hrs.	2 hrs.	4 hrs.
3	Research: Spaces	4 hrs.	4 hrs.	8 hrs.
4	Mood Board	4 hrs.	4 hrs.	8 hrs.
5	Project Follow-up	8 hrs.	8 hrs.	16 hrs.
6	Styles Presentation	4 hrs.	4 hrs.	8 hrs.
7	Project Pre-Final	6 hrs.	6 hrs.	12 hrs.
	TOTAL	30 hrs.	30 hrs.	60 hrs.

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

- Year's work:
  - Spaces Research: 10%
  - Mood Board: 15%
  - Styles Presentations: 5%
  - Final Project: 20%
- Performance & Participation: 10%
- Final Exam 40%

9- List of references:

1. **Recommended Readings:**
   - Jonathan Poore –"Interior Color by Design"– Rockport Publishers.
   - Fielder, William J. (2001) –"The Lit Interior"- Oxford- England
   - Mitton, Maureen (2004) –"Interior Design Visual Presentation"– John Wiley & Sons, 2nd ed. USA
   - Ching, Francis D.K. and Corky Binggeli (2012) –"Interior Design Illustrated 3rd Edition" – John Wiley & Sons.

- Corky Binggeli (2011) –" Interior Graphic Standards: Student Edition 2nd Edition"– John Wiley & Sons.
- Carl Dellatore (2016) –"Interior Design Master Class: 100 Lessons from America's Finest Designers on the Art of Decoration"– Rizzoli.
- Tomris Tangaz (2006) –"Interior Design Course: Principles, Practices, and Techniques for the Aspiring Designer"– Barron's Educational Series.
- Linda O'Shea, Chris Grimley, Mimi Love (2013) –"The Interior Design Reference & Specification Book: Everything Interior Designers Need to Know Every Day"–Rockport Publishers.

10- Facilities required for teaching and learning:

- Design Studios.
- White board.
- Computer & Data show for presentations.
- Architectural Library.
- Internet Connection.

Course coordinator: **Dr. Mohamed El Adly**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix															
		Program ILOs													
		A03	A10	B03	B04	B05	B10	B11	C01	C03	C14	C15	D01	D02	D11
Course ILOs	a1.	●													
	a2.	●													
	a3.	●													
	a4.	●	●												
	a5.	●	●												
	a6.		●												
	a7.		●												
	b1.			●	●										
	b2.			●	●										
	b3.					●	●								
	b4.			●		●	●								
	b5.					●		●							
	c1.								●	●					
	c2.									●	●	●			
	d1.												●	●	
	d2.														●

Table [2]: Course Content/ILO Matrix																
Course Content	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	b5	c1	c2	d1	d2
Introduction: Interior design process	●	●	●													
Project Introduction		●	●													
Research: Spaces	●	●		●	●	●	●	●				●		●	●	●
Mood Board		●		●	●	●	●	●		●	●	●		●	●	●
Project Follow-up								●	●		●		●	●	●	
Styles Presentation				●	●	●	●							●	●	●
Project Pre-Final								●	●	●	●		●	●	●	

Table [3]: Learning Method/ILO Matrix																
Learning Method	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	b5	c1	c2	d1	d2
Lectures	●	●	●	●	●	●	●			●				●		
Design Sketches		●		●	●	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix																
Assessment Method	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	b5	c1	c2	d1	d2
Final Exam		●		●	●	●	●	●	●	●	●	●	●	●	●	
Final Project		●		●	●	●	●	●	●	●	●		●	●	●	
Design Sketches		●		●	●	●	●	●	●	●	●	●	●	●	●	
Assignments	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E04 : Community Development and Participatory Design

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic Level / semester:	Starting from level 3 – 5th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Community Development and Participatory Design **Code: ARC E04**

Credit Hours:	**3 Cr. Hrs.**
Lectures:	**2 Hrs.**
Tutorial:	**2 Hrs.**
Total:	**4 Hrs.**
Prerequisite:	**----------**

B- Professional Information

1- Catalog Course Description:

The course looks at the existence of privacy and territoriality in traditional Arab cities regarding the morphological analysis of the urban spatial pattern. Land utilization, population density, site and services projects for the low income groups. The districts closely integrated physical and social fabric and the way in which social, economic, and cultural factors could all together affect the development of that community.

2- Overall aims of the course:

By the end of the course overall aims should be achieved as follows:

1. Develop design process awareness (including data gathering and analysis).
2. Share ideas and work in a team or a group.
3. Develop drawing and representation techniques.
4. Develop awareness of circulation systems, structures, lighting and form as applied to small scale buildings.

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.
A09.Demonstrate understanding and appreciation to the social, environmental, ethical and economic considerations and human factors affecting the exercise of the architectural decisions
A10. Demonstrate knowledge and understanding of design problems, list clients' needs & requirements and gather relevant information
B07.Incorporate different dimensions of economy, society, environment, technology applicability, safety, site constraints, urban context and risk management in design
B12 Integrate community design parameters into design projects.
B13. Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.
B14 Discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession & practice.
B15. Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.
D08. Search for information and adopt life-long self-learning
D11. Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

By the end of the course successfully the student should be able to:
a1. Identify Human Sciences and Natural Sciences.
a2. Define Environmental Psychology as a relevant discipline of local dense communities.
a3. Summarize the physical common traits in human perception.
a4. Identifie the common psychological structures and responses of local dense communities.
a5. Explain individual differences and preferences.
a6. Explain the difference between the concepts of space and place.
a7. Outline people's psychological needs in open spaces of local dense communities.
a8. Extend space ideality and the narrative concept.

b- Intellectual skills:

By the end of this course the student should be able to:
b1. Compare the discussed concepts with other relevant concepts.
b2. Apply concepts on existing projects of local dense communities. .

c- Professional and practical skills:

Not Applicable

d- General and transferable skills:

By the end of this course the student should demonstrate high ability to:.
d1. To search effectively

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

Topic	Tutorials	Lecture	Total
Urban Rehabilitation	6 hrs.	6 hrs.	12 hrs.
Historic Cities	4 hrs.	4 hrs.	8 hrs.
Design Development of local dense communities	6 hrs.	6 hrs.	12 hrs.
Identity, Character and Urban Pattern	4 hrs.	4 hrs.	8 hrs.
The Morphology Of Spaces In Islamic Cities	4 hrs.	4 hrs.	8 hrs.
The Residential Unit Design Criteria	6 hrs.	6 hrs.	12 hrs.
TOTAL	30 hrs.	30 hrs.	60 hrs.

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%
- semester work:
  - Reports 10%
  - Assignments/submissions 40%
  - Participation 10%

9- List of references:

- **Textbook:**
  Applications of Environment-Behavior Research: Case Studies and Analysis (Environment and Behavior), Cambridge University Press 1993.
- **Handouts:**
  - Chermayeff, Serge. (1965), Community and Privacy. Anchor Books, USA.
  - Sanoff, Henry. (1991) Visual Research Methods in Design, Van Nostrand Reinhold, USA.
  - Smith, Peter. (1979). Architecture and the Human Dimension, The Pitman Press, UK.
- **Recommended books**
  - Rapoport, Amos. (1977). Human Aspects of Urban Form, Pergamon Press, USA.
  - Hillier, Bill. (1988). The Social Logic of Space. Cambridge University Press, UK.

10- Facilities required for teaching and learning:

- Lecture Hall
- White board
- Computer & Data Show for Presentations + Internet Connection.
- Architectural Library
- Field trip services

Course coordinator: **Prof. Osama Al-Rawy**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs									
		A03	A09	A10	B07	B12	B13	B14	B15	D08	D11
Course ILOs	a1.	●	●								
	a2.		●	●							
	a3.		●								
	a4.			●							
	a5.		●								
	a6	●									
	a7	●	●								
	a8	●	●								
	b1				●	●	●		●		
	b2						●	●	●		
	d1.									●	●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	d1
Urban Rehabilitation	●	●	●				●				●
Historic Cities		●	●						●		●
Design Development of local dense communities				●	●		●				
Identity, Character and Urban Pattern			●			●		●			●
The Morphology Of Spaces In Islamic Cities				●		●		●	●		●
The Residential Unit Design Criteria										●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	d1
Lecture	●	●	●	●	●	●	●	●			
Tutorial	●	●	●	●	●	●	●	●	●		
Group work									●	●	●
Seminar										●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	d1
Reports Individual or small Groups										●	●
Teamwork Research									●	●	●
Teamwork Project			●	●	●	●	●	●			●
Research Presentation									●	●	●
written exam : written exam at the end of semester	●	●	●	●	●	●	●	●	●	●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E05: Architectural Heritage
Departmental Elective course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level five / 5th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Architectural Heritage – Departmental Elective **Code: ARC E05**

Credit Hours: **4 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite:
As Advised

B- Professional Information

1- Catalog Course Description:

Criteria for the selection of heritage buildings - The concept of the common heritage and its common sections - International charters and norms to preserve heritage buildings - Problems facing the preservation of architectural heritage - The Authorities concerned with the preservation of heritage - Actions by the Egyptian state to preserve heritage - The use of nanotechnology in the field of restoration of heritage buildings - Prepare a draft restoration report of heritage building - Treatment of architectural and decorative elements of the heritage buildings - Method of preparing report of (the historical study of the building's heritage, photographic documentation, damage and cracks, architectural drawings, philosophy of preserving, restoration project and a plan of restoration).

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Know the concept and criteria of architectural heritage.
2. Identify the preservation and conservation of processes architectural heritage.
3. Learn the method of preparing reports of restoration of heritage buildings.
4. Study the charters and norms of preserving heritage buildings.

3- Intended learning outcomes (ILOs):

3.1. Program ILOs related to course:

A04 Demonstrate knowledge and understanding of history of architecture, urban, and regional planning across different eras.

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

B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.

C05 Prepare and present technical reports, working drawings, and construction documents for design projects.

C19 Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.

D11 Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a.1. Explain the criteria for selecting of heritage buildings.

a.2. Explain the international charters and norms of preserving heritage.

a.3. Explain problems facing the preservation of architectural heritage.

b- Intellectual skills:

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

b.1. Compare the different treatments of preserving heritage.

b.2. Differentiate the Impact between actions by authorities of preserving heritage

c- Professional and practical skills:

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

c.1. Apply the methods of restoration and renovation.

c.2. Apply the principles of treatment of architecture and decorative elements of heritage buildings.

d- General and transferable skills:

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

d.1. Develop the behavior in preservation skills and cooperation work group.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

Week	Topics	Lec.	Tut.	Total
1	Criteria for the selection of heritage buildings	2	2	2
2	The concept of the common heritage and its common sections	2	2	2
3&4	International charters and norms to preserve heritage buildings	4	4	4
5&6	Problems facing the preservation of architectural heritage	4	4	4
7	The Authorities concerned with the preservation of heritage	2	2	2
8	Actions by the Egyptian state to preserve heritage	2	2	2
9&10	The use of nanotechnology in the field of restoration of heritage buildings	4	4	4
11	Prepare a draft restoration of heritage building	2	2	2
12&13	Treatment of architectural and decorative elements of the heritage buildings	4	4	4
14&15	Method of preparing restoration reports	4	4	4
Total		30	30	60

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%
- Year work:
  - In Class Quizzes 20%
  - Assignments 30%
  - Participation 10%

9- List of references:

- Restoration & Preservation - Goethe Institute – 1989
- An Exhibition of Modern Techniques of Restoration
- The Preservation of Culture property

10- Facilities required for teaching and learning:

- Lecture Room
- White board
- Computer & data show for presentations
- Internet connection.
- Architectural Library

Course coordinator: **Prof. Dr. Yousef El Rafie**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs					
		A04	A09	B15	C05	C19	D11
Course ILOs	a1.	●					
	a2.	●					
	a3.		●				
	b1.			●			
	b2.			●			
	c1.				●		
	c2.					●	
	d1.						●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	b1	b2	c1	c2	d1
Criteria for selecting of heritage buildings	●	●	●	●	●	●	●	●
The concept of the common heritage and its common sections	●	●	●	●	●	●	●	●
International charters and norms to preserve heritage buildings	●	●	●	●	●	●	●	●
Problems facing the preservation of architectural heritage	●	●	●	●	●	●	●	●
The Authorities concerned with the preservation of heritage	●	●	●		●	●		
Actions by the Egyptian state to preserve heritage	●	●	●	●	●	●		●
The use of nanotechnology in the field of restoration of heritage buildings	●	●	●	●	●	●	●	●
Prepare a draft restoration of heritage building	●							
Treatment of architectural and decorative elements of the heritage buildings	●							
Method of preparing restoration reports						●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	b1	b2	c1	c2	d1
Lecture	●	●	●	●	●	●	●	●
Assignment	●			●	●	●	●	
Discussion					●			

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	b1	b2	c1	c2	d1
Assignment	●			●	●	●	●	
In class Quiz			●	●	●	●		●
Final Exam	●	●	●	●	●	●	●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E06: Urban Upgrading and Management
Departmental Elective course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level three / 5th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Urban Upgrading and Management **Code: ARC E06**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite:
As Advised

B- Professional Information

1- Catalog Course Description:

This course identifies the different challenges that might face cities and cause different symptoms of deterioration within. The course identifies diverse concepts that lead to deterioration and urban decay, as well as shrinkage of cities. The means of upgrading and revitalization of these cities are discussed explaining how the upgrading process is done in real life. An overview concerning how the city management is done in the administrative authorities in the cities of Egypt and how it should be done, is discussed as well.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Understand what is meant by ghost towns and urban ghosts and their causes
2. Understand the causes leading to shrinking of cities and how to deal with them
3. Learn the concept of urban gaps in terms of vacant housing and misused lands
4. Understand what is meant by urban decay and how to ameliorate it.
5. Learn the meaning of Urbicide and the different post conflict reconstruction strategies.
6. Learn the different strategies of inner city regeneration and upgrading.
7. Understand the city management mechanism in Egypt, its positive aspects and drawbacks.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A03 Demonstrate knowledge and understanding of the principles and theories of urban deterioration, as process and product.

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

A15 Demonstrate knowledge and understanding of the processes of spatial change in the built and natural environments; patterns and problems of cities, and positive and negative impacts of urbanization.

A16 Demonstrate knowledge and understanding of the processes of the significance of urban spaces and the interaction between human behavior, built environment and natural environment.

A18 Demonstrate knowledge and understanding of various dimensions of housing problem and the range of approaches, policies and practices that could be carried out to solve this problem.

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

B05 Derive different alternative solutions and assess their expected performance to reach architectural decisions.

B10 Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.

B12 Integrate community design parameters into design projects.

B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.

B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.

C16 Respect all alternative solutions, changes in original plan of the project, differences in style, culture, experience and treat others with respect.

C19 Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.

D05 Manage tasks and resources.

D10 Acquire entrepreneurial skills.

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. Identify the Ghost towns, shrinking cities and urban decay
a2. Illustrate the causes that led to the urban decay and decline.
a3. Propose the suitable intervention actions to resolve problems.
a4. Investigate conventional approaches of urban regeneration and upgrading.
a5. Define the meaning of Urbicide and post conflict reconstruction.
a6. Explain the city management mechanism in Egypt.

b- Intellectual skills:

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

b.1. Compare between a vibrant city and a decaying city

b.2. Propose solutions to the inner city decay problems.

b.3. Formulate possible scenarios for post conflict reconstruction

b.4. Deduce the drawbacks within the city management system.

c- Professional and practical skills:

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

c1. Use proper presentation techniques for his/her final proposal.

c2. Propose realistic strategies for upgrading and reconstruction of cities.

c3. Identify the related stakeholders in the upgrading projects.

c4. Apply the learned elements on realistic projects.

d- General and transferable skills:

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

d1. Express his/her ideas by visual, graphic, written and verbal means

d2. Discuss and defend his/her ideas.

d3. Manage time and meet deadlines.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

#	Topics	Lec	Tut	Tot.
1	Introduction to the Course Raison d'etre and Ghost Towns and Urban Ghosts	2	2	4
2	First assignment presentation: Examples on urban ghosts & Ghost towns	2	2	4
3	Shrinking cities and how to deal with them	2	2	4
4	Second assignment presentation: Examples on Shrinking cities	2	2	4
5	Urbicide and the deliberate destruction of cities	2	2	4
6	Post-conflict reconstruction strategies and their implementation	2	2	4
7	Urban Gaps in Egyptian cities	2	2	4
8	Urban Decay and core city deterioration	2	2	4
9	Midterm presentations: on related issues	2	2	4
10	How to deal with urban decay?	2	2	4
11	Gentrification and reverse gentrification Inner city regeneration strategies	2	2	4
12	Third assignment presentation: On regeneration strategies	2	2	4
13	City Management in Egypt, a critical review	2	2	4
14	Development projects in Egypt between planning & implementation.	2	2	4
15	Final presentation and end work	2	2	4
Total		30	30	60

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%
- Year's work: 50%
  - First Mid Term Exam 25%
    - 1st Assignment 7.5 %
    - 2nd Assignment 7.5 %
    - Group Research1 10 %
  - Second Mid Term Exam " Group Research 2" 25%
- Participation …… …… 10 %
- **Total 100%**

9- List of references:

1. Recommended Readings:

- Govia, A. , Abandoned Planet, Carpet bombing culture, 2014
- Roberts, P. & Sykes, H.: ***Urban Regeneration***, Sage publications, 2016.
- Yarwwod, J., **Urban Planning after war, disaster and disintegration: Case studies**, Cambridge scholars publishing, 2010.
- Abujidi, N., **Urbicide in Palestine: Space of oppression and resilience,** Taylor and Francis, 2014.
- Periodicals & Web sites:

  http://www.urbanghostsmedia.com

  http://www.shrinkingcities.com/

  http://urban-regeneration.worldbank.org/

10- Facilities required for teaching and learning:

- White board
- Computer and Data show for presentations
- Architectural Library
- Internet connection

Course coordinator: **Assoc. Prof. Dr. Yehya M. Serag**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOS																
		A03	A09	A15	A16	A18	B02	B03	B05	B10	B12	B13	B15	C14	C16	C19	D05	D10
Course ILOs	a1.	●		●	●													
	a2.	●	●	●		●												
	a3.		●	●														
	a4.		●		●													
	a5.	●				●												
	a6.		●			●												
	b1.						●						●					
	b2.							●		●		●						
	b3.								●		●		●					
	b4.						●			●								
	c1.													●				
	c2.														●	●		
	c3.														●	●		
	c4.													●	●			
	d1.																	●
	d2.																●	●
	d3.																●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Raison d'etre and Ghost Towns	●	●															
First presentation	●	●									●			●	●	●	●
Shrinking cities and how to deal with them	●	●	●				●	●				●	●	●		●	
Second presentation	●	●	●				●	●			●				●	●	●
Urbicide and the destruction of cities				●	●				●			●	●			●	
Post-conflict reconstruction strategies				●	●				●			●	●			●	
Urban Gaps in Egyptian cities - Gentrification		●					●						●			●	
Urban Decay, core city deterioration & upgrading	●	●		●			●	●				●	●			●	
Midterm presentations	●	●	●	●	●		●	●	●	●		●		●	●	●	●
Examples on upgrading projects.			●	●			●	●				●	●	●		●	●
City Management in Egypt, a critical review						●				●			●	●		●	
Development projects in Egypt						●				●			●			●	●
Final presentations	●	●	●	●	●		●	●	●	●		●		●	●	●	●

Table [3]: Teaching Method/ILO Matrix

Teaching Method	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Lecture	●	●	●	●	●	●	●	●		●			●	●			
Public Group Discussion			●	●	●		●	●	●		●	●	●	●	●	●	
Search for Data (Self-study)																●	●
Research Presentation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2	d3
Individual presentations	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●
Group Presentations	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●
Final exam	●	●	●	●	●	●	●			●							

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E07: Architectural Aesthetics & Criticism
Departmental Elective course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic Level/Semester:	Starting from level three / 5th Semester
Date of specification approval:	November 2017

A. Basic Information

Title: Architectural Aesthetics & Criticism **Code: ARC E07**
Credit Hours: 3 Cr. Hrs. **Prerequisites: As advised**
Lectures: 2 Hrs.
Tutorial: 2 Hrs.
Total: 4 Hrs.
Prerequisite: As Advised

B. Professional Information

1- Catalog Course Description:

The course emphasizes the multiplicity of architectural thinking.
Principles of architectural criticism – and techniques of evaluating projects are discussed, aesthetics in the arts, fine arts and concept of beauty and the sensual and spiritual – elements of aesthetic composition, case studies.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Develop different techniques of information gathering and data analysis in relation to architectural criticism theme
- Develop knowledge and skills in the different processes of site selection and analysis, & techniques of evaluating projects are discussed
- Analyze and criticize architectural projects through different case studies
- A monetary case study in the modern Egyptian reality, in order to benefit from it, to Prepare the preliminary studies that includes the basic critera of design.

3- Intended learning outcomes of course (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.
A09 Demonstrate understanding and appreciation to the social, environmental, ethical and economic considerations and human factors affecting the exercise of the architectural decisions.
A14 Demonstrate knowledge and understanding of contemporary engineering topics.
B02 Compare, analyze and criticize different engineering problems and case studies, evaluate design alternatives and conclude results based on analytical thinking.
B13 Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.
B14 Discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession & practice.
B15 Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.
C16 Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.
D01 Communicate effectively.
D02 Discuss and defend ideas.
D05 Manage tasks and resources

3.2. Course Detailed ILOs:

a. Knowledge and understanding:
Upon successful completion of the course, the student should be able to:
a.1. Identify contemporary engineering, architectural and urban topics
a.2. List clients' needs/requirements for designing a certain building type
a.3. Interpret different methods of data collection and analysis
a.4. Illustrate a structure for Architectural Aesthetics & technical criticism

b. Intellectual skills:
Upon successful completion of the course, the student should be able to:
b.1. Compare different case studies
b.2. Formulate different alternatives based on analytical thinking
b.3. Assess data collected from different resources

c. Professional and practical skills:
Upon successful completion of the course, the student should be able to:
c.1. Prepare the Architectural Program using appropriate techniques for representation utilizing a mix of different media

d. General and transferable skills:
Upon successful completion of the course, the student should be able to:
d.1. Communicate effectively with others using visual, graphic, written and verbal means
d.2. Discuss ideas
d.3. Manage time under stressful environments and budget constraints.

4- Course ILOs versus Program ILOs relation

See Appendix, Table [1]

5- Course Contents:

Topic	Lecture	Tutorial/ practical	Total
Introduction and presentation of the curriculum + exercise (picture and commentary) on the educational campus	2 hrs.	2 hrs.	4 hrs.
Knowledge structure of architecture + exercise (picture and comment) in the street	2 hrs.	2 hrs.	4 hrs.
Completion of the knowledge structure of architecture + Review a critical article	2 hrs.	2 hrs.	4 hrs.
View, comment, analyze and discuss exercises	4 hrs.	4 hrs.	8 hrs.
Background Theory of Architectural Criticism Select the general steps + Write a review	2 hrs.	2 hrs.	4 hrs.
Architectural criticism and its methods	2 hrs.	2 hrs.	4 hrs.
View and discuss critical articles	2 hrs.	2 hrs.	4 hrs.
criticism and construction in the framework of history + criticism poster exercise	2 hrs.	2 hrs.	4 hrs.
View and discuss individual posters	2 hrs.	2 hrs.	4 hrs.
View ideas and comments for examples of critical scientific research	2 hrs.	2 hrs.	4 hrs.
View a criticism search form + Collective criticism search exercise	4 hrs.	4 hrs.	8 hrs.
Presentation and discussion of collective monetary research + general discussion	4 hrs.	4 hrs.	8 hrs.
TOTAL	30 hrs.	30 hrs.	60 hrs.

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

6- Teaching and learning methods:

For the relation between the Teaching/Learning Methods and "Course Intended Learning Outcomes" (ILOs) see Appendix, Table [3]

7- Student assessment methods:

For the relation between the Student Assessment Methods and "Course Intended Learning Outcomes" (ILOs) see Appendix, Table [4]

8- Weighting of Assessments

- Final Research Submission: 40%
- Year's work: 50%
  - First preliminary research submission 10%
  - Second preliminary research submission 15%
  - Third preliminary research submission 25%
- Participation 10%

100%

9- List of References:

- Raghad Mufeed, 2004, Criticism of the University of Cairo
- Yannar Hassan Jeddou, 1993, Modern Thought and Architecture, Beirut, Dar al-Talibah for Printing
- Nabil Hadi, 2004, Criticism of the University of Cairo
- Recommended Readings:
- Architectural Magazines and Projects
- Periodicals, Web sites, … etc

10- Facilities required for teaching and learning:

- Design Studios
- White board & & papers for sketches

- Computers
- Computer & Data Show for Presentations + Internet Connection.
- Architectural Library
- Site visits

Course coordinator: **Prof. Dr. Osama Elrawi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/Program ILOs Matrix

		Program ILOs											
		A03	A09	A10	A14	B02	B13	B14	B15	C16	D01	D02	D05
Course ILOs	a1	●	●		●								
	a2		●	●									
	a3			●									
	a4	●											
	b1					●			●				
	b2							●					
	b3						●						
	c1									●			
	d1										●		
	d2											●	
	d4												●

Table [2]: Course Content/ILOs Matrix

Course Content	a1	a2	a3	a4	b1	b2	b3	c1	d1	d2	d3
Introduction	●	●	●		●						
Knowledge structure of architecture				●		●		●	●		
View, analyze & discuss exercises	●	●			●	●	●				
Architectural criticism and its methods			●		●	●	●				
Criticism in the framework of history				●							
Presentation and discussion of research	●	●	●	●	●	●	●	●	●	●	●

Table [3]: Learning Method/ILOs Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	c1	d1	d2	d3
Lectures and Presentations on Different Aspects of the Design Problem	●			●				●			
Information Collection from Different Sources	●	●	●				●				
Research Presentation-Collective & individual				●		●		●	●	●	●
Class Discussions, Sessions and Research Critiques	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILOs Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	c1	d1	d2	d3
Reports / Posters	●		●								
To assess ability to gather suitable data and process information"		●					●		●	●	
Oral presentations						●	●		●	●	
Preliminary Presentations	●	●	●		●	●	●	●	●	●	
Research-based work - Collective and individual	●	●	●	●	●	●	●	●	●		●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E08: Appropriate Architecture and Technologies

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level three / 5th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Building Construction and Materials (1) **Code: ARC E08**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite: As Advised

B- Professional Information

1- Catalog Course Description:

The course focuses on Appropriate Architecture and Technologies, Introduction, Properties, Elements and Language of Appropriate Architecture, Natural materials in site, Construction Practices, Architecture form, Materials, Interior Design, Traditional and Contemporary Technologies, Local and Global Architectural projects.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Identify the influence of Appropriate Architecture and Technologies.
2. Develop and achieve the sense of order while dealing with different materials, forms and shapes in designing process.
3. Recognize procedures and properties of appropriate architecture technologies materials and construction that give the building's form.
4. Knowledge of building nature and their sites relations, as well as their social, political. Legal and economic influences on design and construction.

3- Intended Learning Outcomes (ILOs)

3.1. Program ILOs related to course:

A06. Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

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

A12. Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline.

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

B07. Incorporate different dimensions of economy, society, environment, technology applicability, safety, site constraints, urban context and risk management in design.

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

C05. Prepare and present technical reports, working drawings, and construction documents for design projects

of the community.

D07. Work coherently as a part of a multidisciplinary team.

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

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define environmental and human aspects in architecture.
a2. Explain concept of design architecture form and materials.
a3. Identity different architectural natures and sites.
a4. Define properties of architecture technologies, materials and construction through which building are given form.
a5. Define the language of architecture from environmental and materials.
a6. Define the natural energy resources and contemporary vernacular architecture.

b- Intellectual skills:

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

b1. Analyze the relationship between materials properties and structural form.
b2. Conclude the potential applications of building materials.
b3. Explain the relation between technologies and economics.

c- Professional and practical skills:

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

c1. Write technical reports.

d- General and transferable skills:

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

d1. Work in a team effectively.
d2. Gather relevant data.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

Topic	Lecture	Tutorial	Total
Introduction	2 hrs.	2 hrs.	4 hrs.
Elements of Appropriate Architecture	4 hrs.	4 hrs.	8 hrs.
Human Values, Community and Technology	2 hrs.	2 hrs.	4 hrs.
Aesthetic Values and Architectural form Characteristics.	2 hrs.	2 hrs.	4 hrs.
Relationship Between Local materials, construction system and form	4 hrs.	4 hrs.	8 hrs.
Materials, Texture and Interior Design	2 hrs.	2 hrs.	4 hrs.
Time, space , site ,Originality and Modern Science Relationship	2 hrs.	2 hrs.	4 hrs.
Architecture Language	2 hrs.	2 hrs.	4 hrs.
Traditional and Contemporary Technologies and Expressionists Architecture	4 hrs.	4 hrs.	8 hrs.
Continuity Between Local Architecture & Contemporary Architecture	4 hrs.	4 hrs.	8 hrs.
TOTAL	28 hrs.	28 hrs.	56 hrs.

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%
- Year's work: 50%
  - In Class Quizzes 10%
  - Assignments/Studio work 40%
- Participation 10%

9- List of references:

- Hassan Fathy: 1973 Architecture for the poor, AUC Press
- Willaim Facey: 1997 Back To Earth, Al.Turath in Association with the Founden Center of Arab Studios
- HUGH Pearman: 1998 Contemporary World Architecture, Phaidon
- Kenneth Framption: 1996 Charles Correa T&H (Thames & Hudson)
- John V.Mutlow: 1997 The Architecture of RiCARDolegorreta T&H
- Attilio Petruccioli: 2007 After Amnesia Learning from the Islamic Mediterranean urban Fabric, ICAR
- James May: 2010 Handmade Houses & Other Buildings, The World of Vernacular Architecture, T&H
- Hassan Fathy: 1988 Natural Energy & Vernacular Architecture (UNU) The United Nations University

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Data show for presentations

Course coordinator: **Associate. Prof. Dr. Sahar Morsi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date:

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs									
		A06	A07	A09	A12	B04	B07	B11	C05	D07	D08
Course ILOs	a1.		●	●							
	a2.			●	●						
	a3.		●								
	a4.	●			●						
	a5.			●	●						
	a6.		●								
	b1.					●					
	b2.							●			
	b3.						●				
	c1.								●		
	d1.									●	
	d2.										●

Table [2]: Course Content/ILO Matrix

	Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	d1	d2
1	Introduction	●	●	●			●	●					
2	Elements of Appropriate Architecture	●	●					●		●		●	
3	Human Values, Community and Technology	●			●		●			●			
4	Aesthetic Values and Architectural form Characteristics.		●		●	●						●	
5	Relationship Between Local materials, construction system and form		●	●	●		●	●	●		●		●
6	Materials, Texture and Interior Design		●	●	●	●							
7	Time, space , site ,Originality and Modern Science Relationship			●				●					
8	Architecture Language		●		●	●				●			
9	Traditional & Contemporary Technologies and Expressionists Architecture			●			●				●		●
10	Continuity Between Local Architecture & Contemporary Architecture				●			●		●	●		●

Table [3]: Learning Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	d1	d2
Lecture	●	●	●	●	●	●	●	●	●	●		
Report										●	●	●
Class Work	●	●	●	●	●	●	●	●	●	●		

Table [4]: Assessment Method/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	d1	d2
Assignment	●	●	●	●	●	●	●	●	●	●		
Report											●	
Exam(s)	●	●	●	●	●	●	●	●	●	●		●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E09: Innovative Architecture and Technologies
Departmental Elective course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of program:	(Not Applicable)
Department offering the program:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level three / 5th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Elective 9: Innovative/ Architecture and Technologies Code: ARC E09

Credit Hours: 3 Cr. Hrs.
Lectures: 2 Hrs.
Tutorial: 2 Hrs.
Total: 4 Hrs.

Prerequisite:
As Advised

B- Professional Information

1- Catalog Course Description:

Energy efficiency in buildings, New & renewable energy, Air / water / solar energy in architecture, Sustainable Architecture, Green Architecture. New materials and technologies. Case studies.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Gain knowledge related to innovative approaches in environmental design and sustainability applications while still considering local climates, and social, and cultural environments.
- Demonstrate understanding of the wider sustainability concepts (Environment is not only subject to buildings)
- Use gained knowledge to support environmental design concepts.

3- Intended learning outcomes of course (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.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques.

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.

A14 Demonstrate knowledge and understanding of contemporary engineering topics.

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

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

B14 Discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession & practice.

C02 Apply numerical modelling methods to engineering problems.

C14 Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.

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

D11 Refer to relevant literatures.

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a.1. Define the principles of sustainability in architecture and landscape, as process and product.

a.2. List some of building construction systems which relate to building's climatic adaptation such as kinetic architecture.

a.3. Define special technologies and detailing of adaptation methods, such as, double skin buildings, Energy Efficiency technologies, green roofs and walls, etc.

a.4. Explain sustainable design and climatic considerations in relation to the different elements of the natural environment, different energy types, appropriate environmental control techniques and different technical installations in buildings

a.5. Explain the social environmental considerations and human factors affecting the exercise of the architectural and landscape design decisions.

a.6. Explain contemporary environmental approaches such as biomimicry, biophilic, ecological design etc.

b- <u>Intellectual skills:</u>

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

b.1. Differentiate environmental architectural problems often on the basis of limited and possibly contradicting climatic information

b.2. Use creative thinking methods to integrate passive design solutions and zero energy concepts in relationship to building materials, and construction elements into design process.

b.3. Evaluate possible energy efficiency alternatives to propose design solutions.

b.4. Criticize informed innovative opinions.

c- Professional and practical skills:

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

c.1. Design architectural projects that present solutions to climatic and environmental problems.

c.2. Create 2D and 3D sketches to analyze possible case studies

c.3. Use presentation techniques to present case study analysis and design proposals

c.4. Build simple physical models that show innovative environmental solutions

c.5. Provide academic research techniques in terms of searching and analyzing academic references

d- General and transferable skills:

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

d1. Express ideas by visual, graphic, written and verbal means

d2. Discuss and defend ideas

d3. Manage time and meet deadline

d4. Search for relevant information

d5. Communicate effectively with peers and teamwork management

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Contents:

Topic	Lecture	Tutorial	Total
Introduction	2 hrs.	2 hrs.	4 hrs.
Innovative Environmental Architecture Approaches	4 hrs.	4 hrs.	8 hrs.
Sustainability in Egypt	2 hrs.	2 hrs.	4 hrs.
Kinetic Architecture	4 hrs.	4 hrs.	12 hrs.
Sustainable Landscape Design	4 hrs.	4 hrs.	8 hrs.
Green Roofs	4 hrs.	4 hrs.	8 hrs.
Towards Zero Energy Architecture	4 hrs.	4 hrs.	8 hrs.
Re-design Project	6 hrs.	6 hrs.	12 hrs.
TOTAL	30 hrs.	30 hrs.	60 hrs.

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%
- Year work: 50%
  - In Class Quizzes 15%
  - Assignments/Studio work 35%
- Participation 10%

9- List of references:

1. Students Lecture Notes
2. Handouts

3. **Text Book:**
   Integrating Innovation in Architecture: Design, Methods and Technology for Progressive Practice and Research (AD Smart), Dr. Ajla Aksamija , Academy Press; 2017
4. Recommended Readings:
   a) Carbon-neutral Architectural Design by Pablo La Poche, 2012.
   b) Green Building- Guidebook for Sustainable Architecture, by Michael Bauer, Peter Masle, and Michael Schwarz, 2010.
   c) Kinetic Architecture – Designs for Active Envelopes, by Russell Fortmeyer and Charles Linn, 2014.
   d) Sustainable Landscape Construction: A Guide to Green Building Outdoors, by William Thompson and Kim Sorving, 2nd ed, 2007

10- Facilities required for teaching and learning:

- Design Studios
- White board
- Computer & Data Show for Presentations + Internet Connection.
- Architectural Library

Course coordinator: **Prof. Dr. Osama Elrawi**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs											
		A 03	A 06	A 07	A 09	A 14	B 03	B 11	B14	C 02	C 14	D 08	D 11
Course ILOs	a1.	●		●		●							
	a2.		●			●							
	a3.		●	●									
	a4.		●	●									
	a5.	●			●								
	a6.			●		●							
	b1.						●						
	b2.							●					
	b3.						●	●					
	b4.								●				
	c1.									●	●		
	c2.									●	●		
	c3.										●		
	c4.										●		
	c5.										●		
	d1.											●	
	d2.											●	●
	d3.											●	
	d4.											●	●
	d5.											●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	c5	d1	d2	d3	d4	d5
Introduction	●					●													●	
Innovative Environmental Architecture Approaches	●	●	●	●	●	●	●		●	●			●		●	●			●	
Sustainability in Egypt				●	●		●			●									●	
Kinetic Architecture		●				●		●	●	●		●	●	●	●	●	●	●	●	●
Sustainable Landscape Design	●								●	●			●		●	●			●	●
Green Roofs	●	●	●					●		●		●	●			●	●	●	●	●
Towards Zero Energy Architecture	●	●		●		●	●		●	●			●		●	●			●	
Re-design Project	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●

Table [3]: Learning Method/ILO Matrix																				
Learning Method	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	c5	d1	d2	d3	d4	d5
Lecture	●	●	●	●	●	●		●		●						●				
One to one discussion							●	●		●	●	●	●	●	●	●	●		●	●
Group discussion	●			●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
Research presentation	●		●	●	●		●	●		●	●	●	●	●	●	●	●	●	●	●
Poster designs	●		●	●			●	●	●		●	●	●	●	●	●	●	●	●	
Physical Maquette	●		●	●		●		●	●		●	●	●	●	●	●	●	●	●	

Table [4]: Assessment Method/ILO Matrix																				
Assessment Method	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	c5	d1	d2	d3	d4	d5
Research document	●			●	●	●	●			●			●		●	●	●	●		
Oral presentations	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●
Physical Maquette		●	●	●				●						●				●	●	
Sketch designs	●		●	●				●	●		●	●	●				●		●	
Final Exam	●		●	●		●		●	●		●	●	●		●					

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E10: Computer Applications for Architects (3)
Departmental Elective course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level three / 5th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Computer Applications for Architects (3) **Code: ARC E10**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite:
As Advised

B- Professional Information

1- Catalog Course Description:

Responsive Architecture, Interactive Environments, Physical Computing, Parametric Design, Digital Fabrication and CNC, using Arduino, Rhino and Grasshopper Applications with models..

2- Overall aims of the course:

This course aims at::

- Enhance the student's awareness of the responsive and interactive architecture.
- Let student experience the process of making designs according to parametric design principals.
- Train the student to use some advanced CAAD systems such as Rhino and Grasshopper.

3- Intended Learning Outcomes (ILOs)

3.1. Program ILOs related to course:

A02 Demonstrate knowledge and understanding of the basics of information and communication technology (ICT).

A08 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques.

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

B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.

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

C06 Use appropriate computer programs in engineering and architectural works.

C07 Build architectural physical and computer models.

D03 Demonstrate efficient IT capabilities.

D05 Manage tasks and resources.

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

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Identify some CAAD programs outcomes and capabilities.
a2. Define the process of making designs according to controlling parameters.
a3. Identify the concepts of responsive and interactive architecture.

b- Intellectual skills:

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

b1. Visualize graphical forms in three dimensions.
b2. Choose proper tool for making parametric designs.
b3. Analyze architectural forms into controlling parameters.

c- Professional and practical skills:

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

c1. Build architectural digital parametric models using Rhino and Grasshopper applications.
c2. Prepare digital files ready to be used with CNC technology.

d- General and transferable skills:

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

d1. Do simple Search for information.
d2. Manage time to meet deadlines.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Interactive & responsive architecture.	4	4	8
2	Using Arduino boards	4	4	8
3	Parametric Design: definition and concepts	4	4	8
4	Modeling using Rhino.	6	6	12
5	Modeling using Grasshopper.	6	6	12
7	CNC technology	6	6	12
Total		30	30	60

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%
- Year's work: 50%
  - Midterm 1 15%
  - Midterm 2 15%
  - Assignments/Lab work 20%
  - Participation 10%

9- List of references:

1. Text Book:
   Manuals and online help of Rhino and Grasshopper applications.
2. Students Lecture Notes
3. Handouts

10- Facilities required for teaching and learning:

- Lecture Hall
- White board
- Computer & Data show for presentations
- Internet Connection
- Computer Labs

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafar**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs									
		A02	A08	B04	B06	C03	C06	C07	D03	D05	D08
Course ILOs	a1.		●								
	a2.		●								
	a3.	●	●								
	b1.			●							
	b2.			●	●						
	b3.			●	●						
	c1.					●					
	c2.						●	●			
	d1.								●	●	●
	d2.									●	●

Table [2]: Course Content/ Course ILO Matrix

Topic	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Interactive & responsive architecture.		●	●			●			●	
Using Arduino boards	●		●			●			●	
Parametric Design: definition and concepts		●			●	●			●	
Modeling using Rhino.	●			●	●	●	●			●
Modeling using Grasshopper.	●			●	●	●	●			●
CNC technology	●	●		●	●	●		●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Lecture	●	●	●			●				
Lab Work	●	●	●	●	●		●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	b1	b2	b3	c1	c2	d1	d2
Lab Work	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●		●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

ARC E11: Computer Aided Information (GIS)
Departmental Elective Course

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Starting from level Five / 4th Semester
Date of specification approval:	November 2017

A- Basic Information

Title: Computer Aided Information (GIS) **Code: ARC E11**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**

Prerequisite:
As Advised

B- Professional Information

1- Catalog Course Description:

This course introduces the fundamental concepts underlying computerized geographic information systems (GIS). It combines an overview of the general principles of GIS with a theoretical treatment of the nature and analytical use of spatial information (raster and vector). The course has a laboratory component, which introduces students to the ArcGIS software package.

2- Overall aims of the course:

This course aims at:

- Expanding the student's awareness of the basic concepts of spatial analysis (raster and vector data) and GIS data management.
- Train the student to use GIS applications such as ArcGIS software.

3- Intended Learning Outcomes (ILOs)

3.1. Program ILOs related to course:

A02 Demonstrate knowledge and understanding of the basics of information and communication technology (ICT).

A08 Demonstrate knowledge and understanding of architectural physical and computer modeling, simulation, rendering and presentation techniques.

B06 Select, develop, implement and appraise appropriate ICT tools to a variety of architectural and engineering problems.

C06 Use appropriate computer programs in engineering and architectural works.

C07 Build architectural physical and computer models.

D03 Demonstrate efficient IT capabilities.

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define basic concepts of spatial analysis (raster and vector data) and GIS data management

a2. List some different types of data analysis such as roads network analysis, natural hazard, culture resources, land cover and land ownership.

a3. Define the information modeling process.

b- Intellectual skills:

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

b1. Analyze spatial data.

b2. Differentiate between vector and raster spatial data.

c- Professional and practical skills:

By the end of this course the student should maintain high proficiency level at:

c1. Visualize Data into forms.

c2. Use geographic information system software ArcGIS 10.5 to build information model.

c3. Manage geographic problems with GIS software

d- General and transferable skills:

By the end of this course the student should demonstrate fair ability to:

d1. Use Google maps

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Tot.
1	Introduction to remote sensing as spatial data source	2	2	4
2	Characteristics of satellite raster data as the most important GIS data capture	2	2	4
3	What is geographic information science and how does it relate to the use of GIS for scientific purposes Urban planning project	2	2	4
4	What exactly geographic information analysis	4	4	8
5	Vector and raster data structures	2	2	4
6	Geospatial data and its representation vector model and its topology	8	8	16
7	Georeferencing, projection and coordinate system	6	6	12
8	Geographic data model, Digital Elevation Model (3D raster analysis)	2	2	4
9	Regional planning final project	2	2	4
Total		30	30	60

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%
- Year work: 50%
  - Midterm 1 10%
  - Midterm 2 20%
  - Assignments/Lab work 20%
- Participation 10 %

9- List of references:

1. **Text Book:**
   by Longley, Goodchild, Maguire, and Rhind, Geographic Information Systems and Science, 2nd Edition, Wiley or ESRI Press, 2017.
2. ESRI web site (http://www.esri.com
3. An Electronic form of the Course Notes and all the slides of the Lectures is available on the Students Learning Management System (Moodle).
4. Handouts

10- Facilities required for teaching and learning:

- Lecture Hall
- White board
- Computer with a Data show for presentations
- Computer Labs
- Internet Connection

Course coordinator: **Associate. Prof. Dr. Ashraf Gaafar**
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs					
		A02	A08	B06	C06	C07	D03
Course ILOs	a1.		●				
	a2.		●				
	a3.	●					
	b1.			●			
	b2.			●			
	c1.					●	
	c2.				●		
	c3.					●	
	d1.						●

Table [2]: Course Content/ Course ILO Matrix

Topic	a1	a2	a3	b1	b2	c1	c2	c3	d1
Introduction to remote sensing as spatial data source						●			
Characteristics of satellite raster data as the most important GIS data capture	●					●			
What is geographic information science and how does it relate to the use of GIS for scientific purposes Urban planning project		●	●	●		●			
What exactly geographic information analysis	●	●	●	●	●	●	●		
Vector and raster data structures	●	●	●	●	●	●	●		
Geospatial data and its representation vector model and its topology			●	●	●	●	●		
Georeferencing, projection and coordinate system			●			●	●	●	
Geographic data model, Digital Elevation Model (3D raster analysis)			●	●		●	●	●	●
Regional planning final project	●	●	●	●	●	●	●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	b1	b2	c1	c2	c3	d1
Lecture	●	●	●	●	●		●	●	
Practical Work	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	b1	b2	c1	c2	c3	d1
Assignment				●	●	●	●	●	●
Project				●	●	●	●	●	●
Midterms & Final Exam	●	●	●	●	●	●	●	●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

MTH213 - Mathematics, Statistics and Computer

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Architectural Engineering
Academic year/Level:	Level Two –3rd semester
Date of specification approval:	November 2017

A- Basic Information

Title: Mathematics, Statistics and Computer **Code: MTH213**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **3 Hrs.**
Prerequisite:
N/A

B- Professional Information

1- Catalog Course Description:

The course provides students with the basic concepts of Mathematical Statistics and application with Statistical Program e.g. MINITAB, and EXCEL" and to make them able to develop an understanding of mathematical Statistical concepts.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1- Demonstrate knowledge about basic definitions.
2- Use standard method to deal with various techniques of integration.
3- Random variables, distribution functions, estimation, significance statistic. and softwares programs , Computer languages and Applications.
4- Some special families of univariate distributions. Joint, conditional and marginal distributions stochastic independence.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A02 Demonstrate knowledge and understanding of the basics of information and communication technology (ICT).

B01 Apply basic mathematics and physics knowledge to solve physical and engineering problems

B08 Analyze results of numerical models and assess their limitations

C02 Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.

D05 Manage tasks and resources

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define and distinguish between various statistical theories.

a2. Define some of IT tools.

b- Intellectual skills:

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

b1. Solve mathematical problems related to engineering profession.

b2. Analyze results of statistical problems.

c- Professional and practical skills:

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

c1. Apply statistical software to solve engineering problems.

d- General and transferable skills:

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

d1. Manage tasks.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

Topic	Lec.	Tut.	Tot.
Descriptive Statistic: Data Description, Frequency distributions for Categorical Data , Measure of central Tendency , and Numerical Measure of Variability , Measure of position, Exploratory Data Analysis.	6 hrs.	6 hrs.	12 hrs.
Probability and counting: Random variables, Distribution functions, and Joint, conditional and marginal distributions, and Cumulative distribution function	4 hrs.	4 hrs.	8 hrs.
Discrete Probability Distribution: Mean, variance and standard Deviation	4 hrs.	4 hrs.	8 hrs.
Important Distributions: Bin(n,p), Poisson(λ), and $N(\mu,\sigma)$	4 hrs.	4 hrs.	8 hrs.
Confidence Intervals and Sample Size : Confidence Intervals for the Mean when Standard deviation is know , Good Estimator.	4 hrs.	4 hrs.	8 hrs.
Solve problems : Using Statistical Program e.g.: Minitab and Excel programs	8 hrs.	8 hrs.	16 hrs.
TOTAL	30 hrs.	30 hrs.	60 hrs.

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%
- Year's work: 50%
  - First Mid Term Exam 15%
  - Second Mid Term Exam 15%
  - Assignments and quizzes 20%
- Performance & Participation 10 %

9- List of references:

1. **Text Book:**
   Bluman; A. G.
   Elementary Statistics a Step by Step Approach., 1992

10- Facilities required for teaching and learning:

- Computer Lab
- White board
- Data show for presentations
- Library

Course Coordinator:
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs					
		A01	A02	B01	B08	C02	D05
Course ILOs	a1.	●					
	a2.		●				
	b1.			●			
	b2.				●		
	c1.					●	
	d1.						●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	b1	b2	c1	d1
Descriptive Statistic: Data Description, Frequency distributions for Categorical Data , Measure of central Tendency , and Numerical Measure of Variability , Measure of position, Exploratory Data Analysis.	●					●
Probability and counting: Random variables, Distribution functions, and Joint, conditional and marginal distributions, and Cumulative distribution function	●		●	●		●
Discrete Probability Distribution: Mean, variance and standard Deviation	●		●	●		●
Important Distributions: Bin(n,p), Poisson(λ), and $N(\mu,\sigma)$	●		●	●		●
Confidence Intervals and Sample Size : Confidence Intervals for the Mean when Standard deviation is know , Good Estimator.	●		●	●		●
Solve problems : Using Statistical Program e.g.: Minitab and Excel programs		●			●	●

Table [3]: Teaching Method/ILO Matrix

Teaching Method	a1	a2	b1	b2	c1	d1
Lecture	●	●	●	●		
Tutorial			●	●		●
Work @ Lab		●			●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	b1	b2	c1	d1
Assignments	●	●	●	●	●	●
Final exam	●	●	●	●	●	

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

SCM 214: Theory of Structures

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Structural Engineering & Construction Management
Academic year/Level:	Level Two - 4th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Theory of Structures **Code: SCM 214**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: MEC 121

B- Professional Information

1- Catalog Course Description:

Types of structures and loads, classification of structural elements (link, beam, column and shell), types of structures (trusses, frames, arches, cables and surface structures), analysis of statically determinate structures for beams and frames using the equations of equilibrium, stability and determinacy for beams and frames, internal forces developed in structural members subjected to different types of loads (normal force, shear force and bending moment), analysis of truss structures, determine the internal forces in truss members using section and joint methods.
Lecture Hours 2, Exercise/Lab 2.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Identify the types of structural members.
2. Verify the stability of various types of structural systems.
3. Name the causes of instability of structures.
4. Identify the determinacy of a structure and its degree.
5. Apply the equations of equilibrium to get the reactions at supports for different structures subjected to different load types.

6. Calculate the internal force values at any sections in beam or frame structures under various loads.
7. Draw the internal force diagrams for beam and frame structures subjected to concentrated, uniform and triangle loads.
8. Recognize the relationship between load, shear and bending moment in frame elements.
9. Analyze truss structures and determine internal forces in truss members using joint and section methods.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

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

B08 Analyze results of numerical models and assess their limitations.

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

C02 Apply numerical modeling methods to engineering problems.

D05 Manage tasks and resources

D09 Work under stressful environments and within constraints of time and budget

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define various types of structural members.
a2. Identify the stability of structures.
a3. Identify the determinacy of structures.
a4. State the equations of equilibrium.

b- Intellectual skills:

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

b1. Apply the equations of equilibrium.
b2. Analyze various types of instability of structures.
b3. Analyze the determinacy of structures and the degree of indeterminacy.
b4. Relate the relationship between load, shear and bending moment in frame elements.

c- Professional and practical skills:

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

c1. Determine the reactions of determinate structures using the equations of equilibrium.

c2. Calculate the internal force values at any sections in beam or frame structures under various loads.

c3. Draw the internal force diagrams for beam and frame structures subjected to concentrated, uniform and triangle loads.

c4. Determine the internal forces in truss members.

d- General and transferable skills:

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

d1. Work within constraints of time.

d2. Managing time and meeting deadlines.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

Topic	Lec	Tut	Tot
Introduction to structural analysis. Types of structures and members.	2	2	4
Equations of equilibrium. Application on simple and continuous beams.	2	2	4
Application of the equations of equilibrium on frames.	2	2	4
Stability and determinacy.	2	2	4
Internal forces in simple beam.	4	4	8
Internal forces in continuous beam.	4	4	8
Internal forces in frames I.	4	4	8
Internal forces in frames II.	4	4	8
Internal forces in inclined members under uniform and triangular distributed loads.	2	2	4
Analysis of truss structures I.	2	2	4
Analysis of truss structures II.	2	2	4
TOTAL	30.	30	60.

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%
- Year work: 50%
  - Assignments 20%
  - mid-terms 30%
- Performance & Participation 10%

9- List of references:

1. **Text Book:**
   Structural Analysis, R. C. Hibbeler, Pearson Education, 2014.
2. Handouts, prepared by the instructor.

10- Facilities required for teaching and learning:

- White board
- Computer with a Data show for presentations

Course coordinator:

Head of Department: **Prof. Dr. Samir Sadek Hosny**

Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs							
		A01	A06	B02	B08	B11	C02	D05	D09
Course ILOs	a1.		●						
	a2.	●							
	a3.		●						
	a4.	●							
	b1.				●				
	b2.					●			
	b3.			●					
	b4.					●			
	c1.						●		
	c2.						●		
	c3.						●		
	c4.						●		
	d1.								●
	d2.							●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
Introduction to structural analysis. Types of structures and members.	●												●	●
Equations of equilibrium.				●	●				●				●	●
Application of the equations of equilibrium on frames.				●	●				●				●	●
Stability and determinacy.		●	●			●	●						●	●
Internal forces in simple beam.				●	●			●	●	●	●		●	●
Internal forces in continuous beam.				●	●			●	●	●	●		●	●
Internal forces in frames I.				●	●			●	●	●	●		●	●
Internal forces in frames II.				●	●			●	●	●	●		●	●
Internal forces in inclined members under uniform and triangular distributed loads.				●	●			●	●	●	●		●	●
Analysis of truss structures I.					●							●	●	●
Analysis of truss structures II.					●				●			●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
Lecture	●	●	●	●	●	●	●	●	●	●	●	●		
Class Work	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	d1	d2
Assignment	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

SCM 215: Properties and Strength of Materials

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Structural Engineering & Construction Management
Academic year/Level:	Level Two - 4th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Properties and Strength of Materials **Code: SCM 215**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: N/A

B- Professional Information

1- Catalog Course Description:

Various building materials, their properties, testing and uses, Materials used in engineering products, Standards, Codes and inspections, The development of innovative uses of building materials, Concrete: components, manufacturing, quality control, Partitioning materials: gypsum, lime, timber and bricks, The effects of water on building materials,

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

1. Have a clear understanding of concrete constituents.
2. Differentiate between the different types of each constituent, identify the properties, and be aware of testing methods of each constituent.
3. Comprehend the properties and testing methods of concrete in the fresh and hardened stages.
4. Judge the fresh and hardened concrete quality.
5. Overview the different alternatives for specific job conditions.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline.

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

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

C08 Use special field devices.

C11 Apply quality assurance procedures and follow codes and standards.

D05 Manage tasks and resources

D09 Work under stressful environments and within constraints of time and budget

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define some of construction materials such as: Portland cement, concrete aggregates, mixing water, and admixture

a2. List concrete mix design procedures

a3. List properties of fresh and hardened concrete

a4. List experimental test methods for concrete and concrete materials

b- Intellectual skills:

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

b1. Identify different types of concrete materials, resources, different properties

b2. Estimate different phases of concrete through its age

b3. Conduct different concrete mix design methods

b4. Select the appropriate materials and properties for specific job

c- Professional and practical skills:

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

c1. Perform different mix design methods for concrete

c2. Conduct tests on concrete and concrete materials

d- General and transferable skills:

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

d1. Work within constraints of time.

d2. Manage time and meeting deadlines.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

Topic	Lec	Tut	Tot
Basic Fundamental	3	2	5
Cement	6	6	15
Aggregates	6	6	15
Fresh Concrete	6	6	15
Hardened Concrete	4	4	13
Building Stones	6	6	12
TOTAL	30	30	75

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%
- Year work: 50%
  - Assignments 10%
  - Midterms 25%
  - Quizzes 15%
- Performance & Participation 10%

9- List of references:

1. **Recommended Books:**
   - Egyptian Code of Practice.
   - Concrete Technology, A.M.Neville and J.J.Brooks
   - Concrete Microstructure, Properties and Materials, P.K. Mehta and Pauli J.M. Monteiro.
   - Design and Control of Concrete Mixtures, Steven H. Kosmatka, Beatrix Kerkhoff, and William C. Panarese
2. **Handouts, prepared by the instructor.**

10- Facilities required for teaching and learning:

- White board
- Computer with a Data show for presentations

Course coordinator:
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs								
		A01	A06	A12	B02	B11	C08	C11	D05	D09
Course ILOs	a1.			●						
	a2.		●	●						
	a3.		●	●						
	a4.	●								
	b1.					●				
	b2.					●				
	b3.					●				
	b4.				●					
	c1.							●		
	c2.						●			
	d1.									●
	d2.								●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	d1	d2
Concrete as a structural material	●				●				●			
Portland cement	●			●	●			●		●		
Concrete aggregates	●			●	●					●		
Concrete mix design		●					●		●			
Fresh concrete			●	●		●		●		●	●	●
Hardened concrete			●	●		●		●		●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	d1	d2
Lecture	●	●	●	●	●	●	●	●	●	●	●	●
Class Work	●	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	d1	d2
Assignment	●	●	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

SCM 223: Surveying

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Structural Engineering & Construction Management
Academic year/Level:	Level Two – 4th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Surveying **Code: SCM 223**
Credit Hours: **2 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: None

B- Professional Information

1- Catalog Course Description:

Basic elements of surveying and their architectural applications, Plotting scales, verniers, linear of angular and simple angular measurement devices, Chain surveying, Leveling & theodolites, Map drawing, Photogrammetry and its architectural applications.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Different units systems and how to transform among them.
- Distance measurements operations and its usage in mapping.
- Scales used in mapping.
- Surveying application in mapping.
- Leveling process.
- Angular measurements using theodolite.
- Theodolite application through Tacheometry.
- Surveying using total station.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

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

B08 Analyze results of numerical models and assess their limitations.

C04 Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.

C08 Use special field devices.

D01 Communicate effectively.

D07 Work coherently as a part of a multidisciplinary team

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Define the basic concepts of surveying operations.
a2. Define the basic surveying instruments.

b- Intellectual skills:

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

b1. Derive various solutions for distance measurement obstacles.
b2. Differentiate between mapping scales.
b3. Use surveying for mapping purposes.
b4. Analyze leveling data for elevation calculation.
b5. Assess angular measurements.

c- Professional and practical skills:

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

c1. Distinguish distance measurement tools and instruments.
c2. Identify different types of surveying levels.
c3. Categorize surveying level and theodolite screws and parts.
c4. Handle and practically work with the level and theodolite.

d- General and transferable skills:

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

d1. Work in team.
d2. Write observations and results.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

Topic	Lecture	Tutorial	Field	Total
Introduction	2	2	**0**	4
Distance measurement operations	4	2	4	10
Surveying for mapping	2	2	2	6
Usage of scales for mapping	2	2	-	4
Leveling process	6	4	6	16
Basic Concept of Theodolite	2	2	2	6
Angular measurements using theodolite	2	2	2	6
Theodolite Application – Tacheometry	2	2	-	4
Total Station	2	2	-	4
Total	**24**	**20**	**16**	**60**

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%
- Year work: 50%
  - In Class Quizzes 15%
  - Practical Examinations 10%
  - Semester Work 25%
  - Performance & Participation 10%

9- List of references:

1. Students Lecture Notes
2. Handouts

10- Facilities required for teaching and learning:

- Surveying lab
- White board
- Data show for presentations

Course coordinator:
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs							
		A01	A06	B02	B08	C04	C08	D01	D07
Course ILOs	a1.	●							
	a2.		●						
	b1.			●					
	b2.			●					
	b3.				●				
	b4.				●				
	b5.				●				
	c1.					●			
	c2.					●			
	c3.						●		
	c4.						●		
	d1.								●
	d2.							●	

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2
Introduction	●	●		●	●			●					
Distance measurement operations	●	●	●		●			●				●	●
Surveying for mapping	●	●	●	●	●							●	●
Usage of scales for mapping	●			●	●								
Leveling process		●				●			●	●	●	●	●
Basic Concept of Theodolite		●								●	●	●	●
Angular measurements using theodolite		●			●		●			●	●	●	●
Theodolite Application – Tacheometry		●	●				●	●		●	●		
Total Station		●	●		●		●	●		●			

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2
Lecture	●	●	●	●	●	●	●	●	●	●	●		●
Tutorial	●		●	●		●	●					●	●
Practical work	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	b1	b2	b3	b4	b5	c1	c2	c3	c4	d1	d2
Assignment	●	●	●	●	●	●	●	●	●	●	●		●
Lab Reports		●	●	●	●	●	●	●	●	●	●	●	●
Quizzes	●	●	●	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

SCM 317: Reinforced Concrete for architects

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Structural Engineering & Construction Management
Academic year/Level:	Level three – 6th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Reinforced Concrete for arch **Code: SCM 317**

Credit Hours: **2 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: SCM-214 – Theory of structures

B- Professional Information

1- Catalog Course Description:

Design principles of reinforced concrete structures and behavior, Design loads, Design of members subjected to axial forces, flexure and shear. Design of columns and beams, Structural systems for flat slabs, hollow blocks, ribbed slabs and paneled beams, frames, Details of reinforcement.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Know the theory of transferring loads in skeleton buildings.
- Know the main types of concrete structure system elements.
- Know how to approximately dimension the structural concrete members.
- Know how to design several structural elements.
- Fulfill the typical connections and details of steel reinforcement.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline.

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

B08 Analyze results of numerical models and assess their limitations.

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

C10 Apply safe systems at work and observe the appropriate steps to manage risks.

C11 Apply quality assurance procedures and follow codes and standards.

C12 Exchange knowledge and skills with engineering community and industry.

C13 Use appropriate construction techniques and materials to specify and implement different designs;

D07 Work coherently as a part of a multidisciplinary team

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

3.2. Course Detailed ILOs:

a- <u>Knowledge and understanding:</u>

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

a1. Recognize the scientific background (theories and history) of design of reinforced concrete as structural material.

a2. Define concrete characteristics and how they affect the different types of concrete structures.

a3. List main elements of each type of concrete structures.

a4. Choose the main connections and suitable arrangement of rebars

b- <u>Intellectual skills:</u>

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

b1. Analyze design problems.

b2. Develop the design of two dimensional structural elements.

b3. Create structural design of concrete elements and steel reinforcement.

b4. Decide the best structural system and the optimum section size.

c- <u>Professional and practical skills:</u>

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

c1. Draw professional neat structural engineering drawings.

d- <u>General and transferable skills:</u>

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

d1. Work coherently and successfully as a part of a team in projects, assignments.

d2. Use the internet in searching for information about specific building types.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Concrete and steel reinforcement properties	4	4	8
2	Behavior of concrete (Cracking, ultimate and ultimate limit).	2	2	4
3	Assessment of loads and Load distribution	4	4	8
4	Design of beams	6	6	12
5	Design of columns (short and long columns)	4	4	8
6	Shear design of beams	2	4	6
7	Serviceability limit state	4	2	6
7	Systems of slabs and halls including concrete dimensioning	4	4	8
Total		30	30	60

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%
- Year's work: 50%
  - In Class Quizzes and Assignments 40%
  - Project 10%
- Performance & Participation 10%

9- List of references:

1. The Egyptian Code of Practice of Loads assessment (EC-201).
2. The Egyptian Code of Practice of Design and Constructions of Concrete Structures (EC-203).
3. "Design of reinforced concrete structures" Volume 1 Mashour Ghoneim- El-Mehilmy –Cairo University

10- Facilities required for teaching and learning:

- White board
- Computer with Data show for presentations
- Internet Connection

Course coordinator:
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs								
		A01	A06	A12	B02	B08	B11	C12	D07	D08
Course ILOs	a1.	●								
	a2.			●						
	a3.		●							
	a4.		●							
	b1.				●					
	b2.					●				
	b3.						●			
	b4.						●			
	c1.							●		
	d1.								●	
	d2.									●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Reinforced Concrete properties and Behavior	●	●	●								●
Assessment of loads and Load distribution	●	●			●						●
Design of beams		●	●	●	●	●	●	●	●	●	
Design of columns (short and long columns)		●	●	●	●	●	●	●	●	●	
Shear Design		●		●	●	●	●	●	●	●	
Reinforcement and detailing	●			●			●		●	●	
Serviceability limit state		●			●	●	●	●	●	●	
Systems and concrete dimensioning of Slabs' types		●	●	●	●	●	●	●	●	●	

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Lecture	●	●	●	●	●	●	●	●	●		
Project			●	●	●	●	●	●	●	●	●
Class Work	●	●	●	●	●	●	●	●	●		

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Assignments	●	●	●	●	●	●	●	●	●		
Project			●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●		

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

SCM 418: Steel structures for architects

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Structural Engineering & Construction Management
Academic year/Level:	Level Four – 8th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Steel structures for arch **Code: SCM 418**

Credit Hours: **2 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: SCM-214 – Theory of structures

B- Professional Information

1- Catalog Course Description:

Design principles of steel structures, Structural systems, Design loads, Design of members subjected to axial forces, flexure, or shear, Design of bolted and welded connections, Structural details for trusses and frames, Details of connections, Steel structures.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Know the theory of transferring loads in skeleton buildings.
- Know the main types of steel structure system elements.
- Knowing how to approximately sizing of each steel member.
- Fulfill the typical connections and details of steel structures

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline.

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

B08 Analyze results of numerical models and assess their limitations.

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

C10 Apply safe systems at work and observe the appropriate steps to manage risks.

C11 Apply quality assurance procedures and follow codes and standards.

C12 Exchange knowledge and skills with engineering community and industry.

D01 Communicate effectively

D08 Work under stressful environments and within constraints of time and budget

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Recognize the scientific background (theories and history) of design of steel as structural material.

a2. Define steel characteristics and how they affect the different types of steel structures.

a3. List the main elements of each type of steel structures.

a4. Choose the main connections and suitable arrangement of bolts

b- Intellectual skills:

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

b1. Analyze design problems.

b2. Develop the design of two dimensional structural elements.

b3. Create structural design of steel elements and connections.

b4. Decide the best structural system and the optimum section size.

c- Professional and practical skills:

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

c1. Submit professional neat drawings.

d- General and transferable skills:

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

d1. Communicate effectively.

d2. Work within constraints of time.

4- Course ILOs versus Program ILOs relation

See table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Preparation of General Layout	12	6	6
2	Calculation of loads and analysis preparation	4	2	2
3	Design of Tension Members	4	2	2
4	Design compression members	8	4	4
5	Design of beams	4	2	2
6	Design of connections and detailing	12	6	6
7	Design of beam-columns	8	4	4
Total		30	30	60

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%
- Year work: 50%
  - In Class Quizzes 40%
  - Assignments/Studio work 10%
- Participation 10%

9- List of references:

1. The Egyptian Code of Practice of Design and Constructions of Steel Structures.

10- Facilities required for teaching and learning:

- White board
- Computer with Data show for presentations
- Internet Connection

Course coordinator:
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs								
		A01	A06	A12	B02	B08	B11	C12	D01	D08
Course ILOs	a1.	●								
	a2.			●						
	a3.		●							
	a4.		●							
	b1.				●					
	b2.					●				
	b3.						●			
	b4.						●			
	c1.							●		
	d1.								●	
	d2.									●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Preparation of General Layout	●	●	●		●					●	●
Calculation of loads and analysis preparation	●	●			●					●	●
Design of Tension Members		●	●	●	●	●		●	●	●	●
Design compression members		●	●	●	●	●		●	●	●	●
Design of beams		●	●	●	●	●		●	●	●	●
Design of connections and detailing	●		●	●	●		●		●	●	●
Design of beam-columns		●	●	●	●	●		●	●	●	●

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Lecture	●	●	●	●	●	●	●	●			
Class Work	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Assignment	●	●	●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●

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FUE - Future University in Egypt

Faculty of Engineering and Technology
Department of Architectural Engineering

Course Specifications

SCM 442: Foundations for Architects

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Structural Engineering & Construction Management
Academic year/Level:	Level Three – 4th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Foundation for Architects **Code: SCM 442**

Credit Hours: **3 Cr. Hrs.**
Lectures: **2 Hrs.**
Tutorial: **2 Hrs.**
Total: **4 Hrs.**
Prerequisite: No Prerequisite

B- Professional Information

1- Catalogue Course Description:

Soil Characteristics and Mechanics, Preliminarily definitions and Relationships, Soil Properties and Classifications, Stress in Soil and Soil Compressibility, Theory of Consolidation and Settlement, Shear Strength of Soil, Compaction of Soil, Lateral Earth Pressure and Retaining Walls, Site Investigation and Selection of Foundation, Bearing Capacity of Soil, Types of Foundation and Design Principles of Foundations.

2- Overall aims of the course:

The Main Goals of this course are:

- To enhance the students' knowledge about:
  a. The nature of ground soil to be used as a founded material for structures.
  b. Applications of laws of mechanics and hydraulics to soil engineering problems.
- To make the students able to:
  a. Estimate the bearing capacity of soil based on its shear strength and settlement characteristic.
  b. Design principles for foundations of the building based on th Egyptian geotechnical code of practice.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

A01 Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.

A06 Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques

A12 Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline.

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

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

C12 Exchange knowledge and skills with engineering community and industry.

C13 Use appropriate construction techniques and materials to specify and implement different designs;

D01 Communicate effectively

D05 Manage tasks and resources

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

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

a1. Illustrate the origin of soil and the constituent relationships of soil matrix.
a2. List different types of soil classification systems.
a3. Define the load/stress distribution induced within soil layers.
a4. Explain the settlement and shear strength of different soil types.
a5. Estimate the suitable foundation depth, type and bearing capacity.
a6. Choose the proper foundation design.

b- Intellectual skills:

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

b1. Differentiate between different soil types based on its physical and engineering properties as well as its mechanical characteristics.

b2. Select proper foundation system and design according to the Egyptian geotechnical code of practice.

c- Professional and practical skills:

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

c1. Apply the main findings in the soil technical report of site under investigation to design foundations.

c2. Apply Egyptian geotechnical code of practice to design foundations properly.

c3. Draw engineering drawing of foundation design output.

d- General and transferable skills:

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

d1. Communicate effectively.
d2. Manage time to meet deadlines.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Soil Types, Matrix and Classification	4	4	8
2	Stress in Soil, Compressibility, Settlement.	2	2	4
3	Shear Strength and Compaction of Soil.	3	3	6
4	Lateral Earth Pressure and Retaining Walla	1	1	2
5	Site Investigation and Bearing Capacity of Soil.	1	1	2
6	Design Principles of Building Foundations	2	2	4
7	Revision	2	2	4
Total		15	15	30

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%
- Year work: 50%
  - In Class Quizzes 20%
  - Assignments 30%
  - Performance & Participation 10%

9- List of references:

1. Text Book:
   Principles of Geotechnical and Foundation Engineering - Lecture Notes , Bahr M.A., Al Azhar University, Cairo, Egypt.
2. Students Lecture Notes
3. Handouts
4. Recommended Readings:
   a) Das, B. M.; Principles of Geotechnical Engineering, MA02116-4324.
   b) Das, B.M.; Principles of Foundation Engineering, CA 93950.
   c) Egyptian Geotechnical Code of Practice- 2nd Renewal (2002).

10- Facilities required for teaching and learning:

- White board
- Data show for presentations
- Civil Engineering Library

Course coordinator:
Head of Department: **Prof. Dr. Samir Sadek Hosny**
Date: **November 2017**

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs								
		A01	A06	A12	B02	B11	C12	C13	D01	D05
Course ILOs	a1.			●						
	a2.			●						
	a3.	●								
	a4.	●								
	a5.		●							
	a6.		●							
	b1.				●					
	b2.					●				
	c1.						●			
	c2.							●		
	c3.						●			
	d1.								●	
	d2.									●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	a5	a6	b1	b2	c1	c2	c3	d1	d2
Soil Types, Matrix and Classification	●	●					●		●			●	●
Stress in Soil, Compressibility, Settlement.	●	●	●			●		●	●	●		●	●
Shear Strength and Compaction of Soil.	●	●	●		●	●			●	●		●	●
Lateral Earth Pressure and Retaining Walla		●		●			●	●	●			●	●
Site Investigation and Bearing Capacity of Soil.	●	●			●	●	●	●	●			●	●
Design Principles of Building Foundations				●	●	●		●	●		●	●	●
Revision	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [3]: learning/teaching Method/ILO Matrix

learning/teaching Method	a1	a2	a3	a4	a5	a6	b1	b2	c1	c2	c3	d1	d2
Lecture	●	●	●	●	●	●						●	
Research				●	●					●		●	●
Class Work	●	●	●	●	●	●	●	●	●	●	●	●	●

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	a5	a6	b1	b2	c1	c2	c3	d1	d2
Assignments	●	●	●	●	●	●	●	●	●	●	●	●	●
Research				●	●	●						●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●	●	●		●