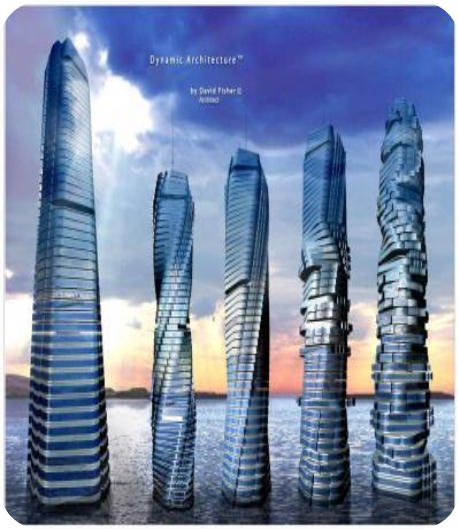
Architectural Engineering



GRADUATION REQUIREMENTS

In the Architectural Engineering Department, Students must complete a minimum of 178 credits satisfactorily. In addition to the common 14-credit required by the university and the common 34-credit required by the college of engineering, the Department of Architectural Engineering requires the following 130-credit

INTRODUCTION

Architecture Engineering in ERU is dedicated to advance the understanding, value and quality of visual culture and the built, natural and social environments through excellent and distinctive teaching, research, and creative endeavors.

Architecture is at a “cross roads” between human/cultural values and the technical capabilities of construction. Moreover, digital technology is rapidly growing, changing our ways of communication, expression, perception, thought and interaction.

Our students and faculty believe that it extremely important to be intellectually prepared to address issues of national and international importance in a meaningful and responsible manner.

VISION

The vision of the Architecture Engineering Program is to provide students and the Architecture with the highest level of technical preparation, professional development and leadership skills for successful careers in Architecture Engineering and excellence in higher education by providing high-quality education based on a well-balanced curriculum.

MISSION

The mission of the department is to train architects who can lead the architectural profession in Egypt and the Middle-East into the digital age while respecting the local heritage.

It is also aims at preparing graduates capable of imagination, creative thinking, problem solving and critical thinking and having ability to conceptualize and create efficient, beautiful designs that satisfy the multiplicity of human, social & ecological needs.

It is the aim to train an architect with a comprehensive vision, capable of integrating all the aspects dealing with the built environment and how it is planned, designed, used, furnished, landscaped, maintained, and appreciated by the society. This is emphasized through a curriculum that maintains a reasonable balance between utilization of the emerging digital design methods and pedagogies, meeting the professional demands, and creating contextual- humanistic and sustainable awareness

The role of the architect is not only to design building but he also has to understand the relationship between people and buildings, and between buildings and their environment.

EDUCATIONAL OBJECTIVES

Architectural education in the ERU program will be based upon the premise that to be an architect in today‘s complex and fast-changing, global society, one must have knowledge in a variety of areas beyond the profession. Recognizing the diversity of roles that are now emerging in the profession, graduates should also have a well-developed interdisciplinary knowledge in which they can initiate their career.

A prime goal of the program is to prepare graduates specialized in Architectural Engineering, (EUR), able to organize livable environments on all levels: isolated buildings or building complexes (Architecture), both externally and internally (Interior Design), relationship between buildings (Urban Design), the way they relate to their surroundings (Landscape Architecture), and Town and Regional Planning.
Beside the architectural and urban design the graduate is able to deal with modern tools & technologies and also to undertake activities related to research, futuristic approach, and development.

Engineers specialized in architecture deal with the built environment. They synthesize human needs, environmental possibilities, building technology, and aesthetic values into designs. The emphasis of this program is on preparing students to become practicing designers.

ARCHITECTURAL ENGINEERING DEPARTMENT COURSES

1.COMPULSORY COURSES (122 CREDITS):

Course Code	Course Title	Credit Hours	Prerequisite
AR101	Architectural Design I	4	BS010
AR102	Architectural Design II	4	AR101
AR103	History of Architecture I	3	AR101
AR104	Sciagraphy& Perspective	3	BS010
AR106	Visual study & Basics of Design	3	BS010
AR110	Building Construction 1	3	AR101
BS105A	Computer Applications in Engineering (AR)	2	BS006- AR101
AR201	Architectural Design III	4	AR102
AR202	Architectural Design IV	4	AR201
AR203	Theories of Architecture I	3	AR101
AR204	History of Architecture II	3	AR103
AR205	Building Construction II	3	AR110
AR206	Building Construction & Introduction to Working Design	3	AR205
AR207	Environmental Control	2	AR102
AR208	Interior Design	3	AR102
AR210	History & Theories of Planning	2	BS105(AR)
AR212	Computer Applications in Architecture	2	BS105(AR)
AR301	Architectural Design V	4	AR202
AR302	Architectural Design VI	4	AR301
AR303	History of Islamic Architecture	3	AR204
AR304	Theories of Architecture II	3	AR203
AR305	Working Drawing I	3	AR206
AR306	Working Drawing II	3	AR305
AR307	Environmental Design & Energy	2	AR207
AR308	Housing	2	AR309
AR309	Urban Design	3	AR210
AR310	Building Technology	2	AR206
AR311	Project Management	2	AR110
AR401	Architectural Design VII	4	AR302
AR402	Quantities & Specifications	3	AR305
AR403	Working Drawing III	4	AR306
AR405	Urban Planning	3	AR210
AR407	Landscape	3	AR309
AR499 * AR499 I	Graduation Project I	-	**AR302-AR306- 133Cr.Hr-CGPA 2**
AR499 * AR499 II	Graduation Project II	9	**AR401-AR403-AR499 I**
CE111(AR)	Properties of Materials (AR)	2	18Cr.Hr
CE112 (AR)	Plane Surveying (AR)	2	18Cr.Hr
CE113(AR)	Structural Analysis (AR)	2	BS007
CE114(AR)	Reinforced Concrete(AR)	2	CE113AR
CE215(AR)	Steel Construction (AR)	2	CE113AR
CE216(AR)	Soil Mechanics & Foundations (AR)	2	36Cr.Hr
CE217(AR)	Technical & Sanitary Fixtures (AR)	2	AR110

2.Elective Courses (8 Credits)

Prerequisite: senior standing
Students at the senior standing must complete 8 credits from the following electives:

Course Code	Course Title	Credit Hours	Prerequisite
	ELECTIVE 1		
AR331(1)	Humanities in Architecture	2	72Cr.Hr
AR332(1)	Visual Drawing & Colors	2	72Cr.Hr
AR333(1)	History and Theories of Restoration& Conservation	2	72Cr.Hr
AR334(1)	Form &Aesthetics in Architecture	2	72Cr.Hr
AR335(1)	Advanced Computer -Aided Architectural Design	2	72Cr.Hr
	ELECTIVE 2		
AR461(2)	Geographic Information System(GIS)	2	109Cr.Hr
AR462(2)	Interior Design Principles	2	109Cr.Hr
AR463(2)	Architectural Legislations	2	109Cr.Hr
AR464(2)	Town Planning	2	109Cr.Hr
AR445(2)	Computational Design Techniques in Architecture	2	109Cr.Hr
	ELECTIVE 3		
AR451(3)	Technical Drawing for Designer	2	128Cr.Hr
AR452(3)	Conservation of Historic Areas	2	128Cr.Hr
AR453(3)	Acoustic in Architecture	2	128Cr.Hr
AR454(3)	Advantage Study on Sustainability in Engineering and Architecture Design	2	128Cr.Hr
AR455(3)	Building Technology &Advanced Construction System	2	128Cr.Hr
	ELECTIVE 4		
AR461(4)	Architectural Criticism &Project Evolution	2	128Cr.Hr
AR462(4)	Architecture for Hot Climate Regions	2	128Cr.Hr
AR463(4)	Urban Landscape	2	128Cr.Hr
AR464(4)	Renovation and Urban Development	2	128Cr.Hr
AR465(4)	Regional & Contemporary Architecture	2	128Cr.Hr

ARCHITECTURAL ENGINEERING PROGRAM
FRESHMAN

- **Semester 3**

Course Code	Course Title	Credit Hours	LT	TU	LB	Contact Hours
AR101	Architectural Design I	4	2	4	-	6
AR106	Visual Study & Basics of Design	3	2	2	-	4
CE111	Properties of Materials	2	2	1	-	3
CE113	Structural Analysis	2	2	1	-	3
BS108	Probability and Statistics in Engineering	2	2	1	-	3
HM101	Technical Writing	2	2	-	-	2
HM	Elective	2	2	-	-	2
Total		**17**	**14**	**9**		**23**

- **Semester 4**

Course Code	Course Title	Credit Hours	LT	TU	LB	Contact Hours
AR102	Architectural Design II	4	2	4	-	6
AR103	History of Architecture I	3	2	2	-	4
AR104	Sciagraphy & Perspective	3	2	3	-	5
AR110	Building Construction 1	3	1	3	-	4
CE112	Plane Surveying	2	2	-	1	3
CE114	Reinforced Concrete	2	2	1	-	3
BS105	Computer Applications in Engineering.	2	1	-	3	4
EN101	Technical Training I	-	-	-	-	-
Total		**19**	**12**	**13**	**4**	**29**

ARCHITECTURAL ENGINEERING PROGRAM
SOPHOMORE

- **Semester 5**

Course Code	Course Title	Credit Hours	LT	TU	LB	Contact Hours
AR201	Architectural Design III	4	2	4	-	6
AR203	Theories of Architecture I	3	2	2	-	4
AR204	History of Architecture II	3	2	2	-	4
AR205	Building Construction II	3	1	4	-	5
AR207	Environmental Control	2	2	1	-	3
CE215	Steel &Wood Construction	2	2	1	-	3
HM102	Scientific Thinking	2	2	-	-	2
Total		**19**	**13**	**14**		**27**

- **Semester 6**

Course Code	Course Title	Credit Hours	LT	TU	LB	Contact Hours
AR202	Architectural Design IV	4	2	4	-	6
AR206	Building Construction & Introduction to Working Design	3	1	4	-	5
AR208	Interior Design	3	1	4	-	5
AR210	History & Theories of Planning	2	2	1	-	3
AR212	Computer Applications in Architecture	2	1	-	3	4
CE216	Soil Mechanics & Foundations	2	2	-	1	3
CE217	Technical & Sanitary Fixtures	2	1	2	-	3
EN201	Technical Training II	-	-	-	-	-
Total		**18**	**10**	**15**	**4**	**29**

ARCHITECTURAL ENGINEERING PROGRAM
JUNIOR

- **Semester 7**

Course Code	Course Title	Credit Hours	LT	TU	LB	Contact Hours
AR301	Architectural Design V	4	2	4	-	6
AR304	Theories of Architecture II	3	2	2	-	4
AR305	Working Drawing I	3	1	4	-	5
AR307	Environmental Design & Energy	2	1	-	2	3
AR309	Urban Design	3	2	2	-	4
AR311	Project Management	2	2	1	-	3
HM	Elective	2	2	-	-	2
Total		**19**	**12**	**13**	**2**	**27**

- **Semester 8**

Course Code	Course Title	Credit Hours	LT	TU	LB	Contact Hours
AR302	Architectural Design VI	4	2	4	-	6
AR303	History of Islamic Architecture	3	2	2	-	4
AR306	Working Drawing II	3	1	4	-	5
AR308	Housing	2	2	2	-	4
AR310	Building Technology	2	2	2	-	4
AR	Elective (1)	2	2	-	-	2
HM202	Engineering Economics and Management	2	2	-	-	3
EN301	Technical Training III	-	-	-	-	-
Total		**18**	**13**	**14**		**27**

ARCHITECTURAL ENGINEERING PROGRAM
SENIOR

- **Semester 9**

Course Code	Course Title	Credit Hours	LT	TU	LB	Contact Hours
AR401	Architectural Design VII	4	2	4	-	6
AR403	Working Drawing III	4	2	4	-	6
AR405	Urban Planning	3	2	2	-	4
AR407	Landscape	3	2	2	-	4
AR	Elective (2)	2	2	-	-	2
AR499 I	Graduation Project I	3	-	6	-	6
Total		**19**	**10**	**18**		**28**

- **Semester 10**

Course Code	Course Title	Credit Hours	LT	TU	LB	Contact Hours
AR402	Quantities & Specifications	3	2	2	-	4
AR	Elective (3)	2	2	-	-	2
AR	Elective (4)	2	2	-	-	2
AR 499II	Graduation Project II	6	-	12	-	12
Total		**13**	**6**	**14**		**20**

ARCHITECTURAL ENGINEERING PROGRAM

Code	Course Title	CR	LT	TU	LB	CT	Code	Course Title	CR	LT	TU	LB	CT
Preparatory	**Semester 1**							**Semester 2**					
BS001	Mathematics 1	3	2	2	-	4	BS002	Mathematics 2	3	2	2	-	4
BS003	Physics 1	3	2	1	1	4	BS004	Physics 2	3	2	1	1	4
BS005	Chemistry	3	2	1	1	4	BS008	Engineering Mechanics 2	3	2	2	-	4
BS007	Engineering Mechanics 1	3	2	2	-	4	BS010	Engineering Drawing 2	2	1	2	-	3
BS009	Engineering Drawing 1	2	1	2	-	3	HM002	Russian Language 2	2	1	2	-	3
HM001	Russian Language 1	1	-	2	-	2	HM004	English Language 2	2	1	2	-	3
HM003	English Language 1	1	-	2	-	2	BS006	Computer Aided Drawing	1	-	-	2	2
HM005	Introduction to Engineering	2	2	-	-	2	ME002	Production Technology	2	1	1	1	3
Total		**18**	**11**	**12**	**2**	**25**	**Total**		**18**	**10**	**12**	**4**	**26**
Freshman	**Semester 3**							**Semester 4**					
AR101	Architectural Design I	4	2	4	-	6	AR102	Architectural Design II	4	2	4	-	6
AR106	Visual Study & Basics of Design	3	2	2	-	4	AR103	History of Architecture I	3	2	2	-	4
CE111	Properties of Materials	2	2	1	-	3	AR104	Sciagraphy & Perspective	3	2	3	-	5
CE113	Structural Analysis	2	2	1	-	3	AR110	Building Construction I	3	1	3	-	4
BS108	Probability and Statistics in Engineering	2	2	1	-	3	CE112	Plane Surveying	2	2	-	1	3
HM101	Technical Writing	2	2	-	-	2	CE114	Reinforced Concrete	2	2	1	-	3
HM	Elective	2	2	-	-	2	BS105	Computer Applications in Engineering.	2	1	-	3	4
							EN101	Technical Training I	-	-	-	-	-
Total		**17**	**14**	**9**		**23**	**Total**		**19**	**12**	**13**	**4**	**29**
Sophomore	**Semester 5**							**Semester 6**					
AR201	Architectural Design III	4	2	4	-	6	AR202	Architectural Design IV	4	2	4	-	6
AR203	Theories of Architecture I	3	2	2	-	4	AR206	Building Construction & Introduction to Working Design	3	1	4	-	5
AR204	History of Architecture II	3	2	2	-	4	AR208	Interior Design	3	1	4	-	5
AR205	Building Construction II	3	1	4	-	5	AR210	History & Theories of Planning	2	2	1	-	3
AR207	Environmental Control	2	2	1	-	3	AR212	Computer Applications in Architecture	2	1	-	3	4
CE215	Steel & Wood Construction	2	2	1	-	3	CE216	Soil Mechanics & Foundations	2	2	-	1	3
HM102	Scientific Thinking	2	2	-	-	2	CE217	Technical & Sanitary Fixtures	2	1	2	-	3
							EN201	Technical Training II	-	-	-	-	-
Total		**19**	**13**	**14**		**27**	**Total**		**18**	**10**	**15**	**4**	**29**
Junior	**Semester 7**							**Semester 8**					
AR301	Architectural Design V	4	2	4	-	6	AR302	Architectural Design VI	4	2	4	-	6
AR304	Theories of Architecture II	3	2	2	-	4	AR303	History of Islamic Architecture	3	2	2	-	4
AR305	Working Drawing I	3	1	4	-	5	AR30	Working Drawing II	3	1	4	-	5

AR307	Environmental Design & Energy	2	1	-	2	3	6 AR308	Housing	2	2	2	-	4
AR309	Urban Design	3	2	2	-	4	AR310	Building Technology	2	2	2	-	4
AR311	Project Management	2	2	1	-	3	AR	Elective (1)	2	2	-	-	2
HM	Elective	2	2	-	-	2	HM202	Engineering Economics and Management	2	2	-	-	2
							EN301	Technical Training III	-	-	-	-	-
Total		**19**	**12**	**13**	**2**	**27**	**Total**		**18**	**13**	**14**		**27**
Senior	**Semester 9**							**Semester 10**					
AR401	Architectural Design VII	4	2	4	-	6	AR402	Quantities & Specifications	3	2	2	-	4
AR403	Working Drawing III	4	2	4	-	6	AR	Elective (3)	2	2	-	-	2
AR405	Urban Planning	3	2	2	-	4	AR	Elective (4)	2	2	-	-	2
AR407	Landscape	3	2	2	-	4	AR 499 II	Graduation Project II	6	-	12	-	12
AR	Elective (2)	2	2	-	-	2							
AR499 I	Graduation Project I	3	-	6	-	6							
Total		**19**	**10**	**18**		**28**	**Total**		**13**	**6**	**14**		**20**

CONT. ARCHITECTURAL ENGINEERING PROGRAM

Code	Course Title	Cr	LT	Tu	LB	CT	Time Exam	Code	Course Title	Cr	LT	Tu	LB	CT	Time Exam
Preparatory	**Semester 1**								**Semester 2**						
BS001	Mathematics 1	3	2	2	-	4	2	BS002	Mathematics 2	3	2	2	-	4	2
BS003	Physics 1	3	2	1	1	4	2	BS004	Physics 2	3	2	1	1	4	2
BS005	Engineering Mechanics 1	3	2	2	-	4	2	BS008	Engineering Mechanics 2	3	2	2	-	4	2
BS007	Engineering Drawing 1	2	1	2	-	3	2	BS010	Engineering Drawing 2	2	1	2	-	3	2
BS009	Production Technology	2	1	1	1	3	2	HM002	Chemistry	3	2	1	1	4	2
HM001	Introduction to Engineering	2	2	-	-	2	2	HM004	Computer Aided Drawing	1	-	-	2	2	2
HM003	Russian Language 1	2	1	2	-	3	2	BS006	Russian Language 2	2	1	2	-	3	2
HM005	English Language 1	2	1	2	-	3	2	ME002	English Language 2	1	-	2	-	2	2
Total		**19**	**12**	**12**	**2**	**26**		**Total**		**18**	**10**	**12**	**4**	**26**	
Freshman	**Semester 3**								**Semester 4**						
AR101	Architectural Design I	4	2	4	-	6	6	AR102	Architectural Design II	4	2	4	-	6	6
AR106	Visual Study & Basics of Design	3	2	2	-	4	5	AR103	History of Architecture I	3	2	2	-	4	3
CE111	Properties of Materials(AR)	2	2	1	-	3	2	AR104	Sciagraphy& Perspective	3	2	3	-	5	5
CE113	Structural Analysis(AR)	2	2	1	-	3	2	AR110	Building Construction I	3	1	3	-	4	4
BS108	Probability and Statistics in Engineering	2	2	1	-	3	2	CE112	Computer Applications in Engineering(AR)	2	1	-	2	3	3
HM101	Technical Writing	2	2	-	-	2	2	CE114	Plane Surveying(AR)	2	2	-	1	3	2
HM	Elective	2	2	-	-	2	2	BS105	Reinforced Concrete(AR)	2	2	1	-	3	2
								EN101	Technical Training I	-	-	-	-	-	
Total		**17**	**14**	**9**		**23**		**Total**		**19**	**12**	**13**	**3**	**28**	
Sophomore	**Semester 5**								**Semester 6**						
AR201	Architectural Design III	4	2	4	-	6	6	AR202	Architectural Design IV	4	2	4	-	6	6
AR20	Theories of Architecture	3	2	2	-	4	3	AR20	History of Architecture II	3	2	2	-	4	3

3	I							6									
AR204	Building Construction II	3	1	3	-	4	4	AR208	Building Construction & Introduction to Working Design	3	1	3	-	4	5
AR205	Environmental Control	2	2	1	-	3	3	AR210	Interior Design	3	1	3	-	4	4
AR207	Computer Applications in Architecture	2	1	-	3	4	3	AR212	History & Theories of Planning	2	2	1	-	3	3
CE215	Steel Construction(AR)	2	2	1	-	3	2	CE216	Technical & Sanitary Fixtures	2	2	1	-	3	3
HM102	Scientific Thinking	1	1	-	-	1	2	CE217	Soil Mechanics & Foundations(AR)	2	2	-	1	3	2
								EN201	Technical Training II	-	-	-	-	-	
Total		**17**	**11**	**11**	**3**	**25**		**Total**		**19**	**12**	**14**	**1**	**27**	
Junior	**Semester 7**								**Semester 8**						
AR301	Architectural Design V	4	2	4	-	6	6	AR302	Architectural Design VI	4	2	4	-	6	6
AR304	History of Islamic Architecture	3	2	2	-	4	3	AR303	Theories of Architecture II	3	2	2	-	4	3
AR305	Working Drawing I	3	1	3	-	4	5	AR306	Working Drawing II	3	1	3	-	4	5
AR307	Environmental Design & Energy	2	1	-	2	3	3	AR308	Housing	2	2	2	-	4	4
AR309	Urban Design	3	2	2	-	4	4	AR310	Building Technology	2	2	2	-	4	3
AR311	Project Management	2	2	1	-	3	2	AR	Elective 1	2	2	-	-	2	2
HM	Elective	**2**	**2**	-	-	**2**	2	HM202	Engineering Economics and Management	2	2	-	-	2	2
								EN301	Technical Training III	-	-	-	-	-	
Total		**19**	**12**	**12**	**2**	**26**		**Total**		**18**	**13**	**13**		**26**	
Senior	**Semester 9**								**Semester 10**						
AR401	Architectural Design VII	4	2	4	-	6	6	AR402	Quantities &Specifications	3	2	2	-	4	4
AR403	Working Drawing III	4	2	4	-	6	6	AR	Elective 3	2	2	-	-	2	2
AR405	Urban Planning	3	2	2	-	4	4	AR	Elective 4	2	2	-	-	2	2
AR407	Landscape	3	2	2	-	4	5	AR 499 II	Graduation Project II	9	-	12	-	12	-
AR	Elective 2	2	2	-	-	2	2								
AR499 I	Graduation Project I	-	-	6	-	6	-								
Total		**16**	**10**	**18**		**28**		**Total**		**16**	**6**	**14**		**20**	

CONT. ARCHITECTURAL ENGINEERING PROGRAM

Code	Course Title	CW	MT	LB	WR	total	Code	Course Title	CW	MT	LB	WR	total
Preparatory	**Semester 1**						**Semester 2**						
BS001	Mathematics 1	30	20	-	50	100	BS002	Mathematics 2	30	20	-	50	100
BS003	Physics 1	25	20	5	50	100	BS004	Physics 2	25	20	5	50	100
BS005	Engineering Mechanics 1	30	20	-	50	100	BS008	Engineering Mechanics 2	30	20	-	50	100
BS007	Engineering Drawing 1	40	20	-	40	100	BS010	Engineering Drawing 2	40	20	-	40	100
BS009	Production Technology	20	20	20	40	100	HM002	Chemistry	20	20	20	40	100
HM00	Introduction to	30	20	-	50	100	HM00	Computer Aided Drawing	30	20	-	50	100

1	Engineering						4						
HM003	Russian Language 1	30	20	-	50	100	BS006	Russian Language 2	30	20	-	50	100
HM005	English Language 1	30	20	-	50	100	ME002	English Language 2	30	20	-	50	100
Total							**Total**						
Freshman	**Semester 3**						**Semester 4**						
AR101	Architectural Design I	40	20	-	40	100	AR102	Architectural Design II	40	20	-	40	100
AR106	Visual Study & Basics of Design	40	20	-	40	100	AR103	History of Architecture I	30	20	-	50	100
CE111	Properties of Materials(AR)	30	20	-	50	100	AR104	Sciagraphy& Perspective	40	20	-	40	100
CE113	Structural Analysis(AR)	30	20	-	50	100	AR110	Building Construction I	40	20	-	40	100
BS108	Probability and Statistics in Engineering	30	20	-	50	100	CE112	Computer Applications in Engineering(AR)	30	20	-	50	100
HM101	Technical Writing	30	20	-	50	100	CE114	Plane Surveying(AR)	30	20	-	50	100
HM	Elective	30	20	-	50	100	BS105	Reinforced Concrete(AR)	30	20	-	50	100
							EN101	Technical Training I	-	-	-	-	-
Total							**Total**						
Sophomore	**Semester 5**						**Semester 6**						
AR201	Architectural Design III	40	20	-	40	100	AR202	Architectural Design IV	40	20	-	40	100
AR203	Theories of Architecture I	30	20	-	50	100	AR206	History of Architecture II	30	20	-	50	100
AR204	Building Construction II	40	20	-	40	100	AR208	Building Construction & Introduction to Working Design	40	20	-	40	100
AR205	Environmental Control	30	20	-	50	100	AR210	Interior Design	40	20	-	40	100
AR207	Computer Applications in Architecture	30	20	-	50	100	AR212	History & Theories of Planning	30	20	-	50	100
CE215	Steel Construction(AR)	30	20	-	50	100	CE216	Technical & Sanitary Fixtures	30	20	-	50	100
HM102	Scientific Thinking	30	20	-	50	100	CE217	Soil Mechanics & Foundations(AR)	30	20	-	50	100
							EN201	Technical Training II	-	-	-	-	-
Total							**Total**						
Junior	**Semester 7**						**Semester 8**						
AR301	Architectural Design V	40	20	-	40	100	AR302	Architectural Design VI	40	20	-	40	100
AR304	History of Islamic Architecture	30	20	-	50	100	AR303	Theories of Architecture II	30	20	-	50	100
AR305	Working Drawing I	40	20	-	40	100	AR306	Working Drawing II	40	20	-	40	100
AR307	Environmental Design & Energy	30	20	-	50	100	AR308	Housing	40	20	-	40	100
AR309	Urban Design	40	20	-	40	100	AR310	Building Technology	30	20	-	50	100
AR311	Project Management	30	20	-	50	100	AR	Elective 1	30	20	-	50	100
HM	Elective	30	20	-	50	100	HM202	Engineering Economics and Management	30	20	-	50	100
							EN301	Technical Training III	-	-	-	-	-
Total							**Total**						
Senior	**Semester 9**						**Semester 10**						
AR401	Architectural Design VII	40	20	-	40	100	AR402	Quantities &Specifications	30	20	-	50	100
AR403	Working Drawing III	40	20	-	40	100	AR	Elective 3	30	20	-	50	100
AR405	Urban Planning	40	20	-	40	100	AR	Elective 4	30	20	-	50	100
AR407	Landscape	40	20	-	40	100						Final project	
AR	Elective 2	30	20	-	50	100	AR 499 II	Graduation Project II	60			40	100
AR499 I	Graduation Project I	-	-	-	-	-							
Total							**Total**						

ARCHITECTURE ENGINEERING
COURSE DESCRIPTION

1. ARCHITECTURAL DESIGN I

Code	Credit Hours	LT	TU	LB	Prerequisites
AR101	4	2	4	-	BS010

Identifying the design process and its variable dimensions/ Studying the distribution of main uses and how to connect them using circulation elements/ Studying qualitative and quantitative space needs for different activities/ Studying elevations and openings required for different spaces/ Linking among human, climatic and functional needs/ Studying simple structure for small buildings/ Training the student to solve simple design problems.

2.ARCHITECTURAL DESIGN II

Code	Credit Hours	LT	TU	LB	Prerequisites
AR102	4	2	4	-	AR101

The design process and its various aspects, Functional relations and 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, Simple design problem solving . Form space and composition. Students are required to think of architecture from the "outside-in" approach, with focus being placed on the form of architecture and its composition. An emphasis will be placed on the compositional aspects of spatial design- proportion, balance, rhythm, dynamics etc. and their use as tools of functional accommodation. Three-dimensional models play an important role in design development and students will be encouraged to think spatially rather than in the conventional Cartesian format. Issues of meaning, message and symbolism will be discussed and applied. Various works of architects adopting this formalistic approach will be reviewed and analyzed.

3.HISTORY OF ARCHITECTURE I

Code	Credit Hours	LT	TU	LB	Prerequisites
AR103	3	2	2	-	AR101

The historic formation of architecture –aesthetic values of the historic architectural orders: analytic study of the influential factors that shape architectural styles and orders – origins of architecture and its evolution with emphasis on pre-historic, Ancient Egyptian architecture, Mesopotamia and Minor-Asia architecture, Greek and roman architecture .

4.Sciagraphy and Perspective

Code	Credit Hours	LT	TU	LB	Prerequisites
AR104	3	2	3	-	BS010

Developing the imagination of space giving the possibilities of rendering space image in a practical manner/ Shading elevations to emphasize masses and their importance in architectural configuration/ Studying basic laws of sciagraphy: shade of points, lines, levels and masses/ Studying basic laws of perspective: picture plane, standing point, cone of vision, angle of vision, vanishing points, inverse perspective/ Drawing perspective using computer/ Training the student to catch shade and shadows of different forms: arches, staircases, terraces, openings, domes/ Training the student to draw the perspective of different forms and spaces using one-vanishing-point perspective/ Two-point- perspective/ Three-point- perspective/ Shade and shadow in perspective.

5.Visual Study And Basics of Design

Code	Credit Hours	LT	TU	LB	Prerequisites
AR106	3	2	2	-	BS010

The course introduces various drawing principles and artistic techniques: Pencil techniques, Pen and ink, Colors and Materials, Scale and composition, Foreground, Middle and background, Sketching architectural elements and landscapes.
Developing the capacity to conceive, understand and design two-dimensional figures as well as three-dimensional spatial forms/ Working out to understand and conceive the basics of design including proportions, rhythm, harmony and contrast/ Identifying the functional basics of designing different architectural units taking into account the factors of efficiency, comfort and safety.

6. Building Construction 1

Code	Credit Hours	LT	TU	LB	Prerequisites
AR110	3	1	3	-	AR101

Architectural building: basics and fundamentals of architectural building/ Architectural and constructive symbols and codes of materials/ Fundamentals of building works (stone, timber, masonry, concrete, steel) and types of building (skeleton, bearing walls)/ Arches/ lintel/ Staircases/ Means of isolation (moisture, heat, acoustic)/ Studying types of openings (doors, widows, etc.).

7.Architectural Design III

Code	Credit Hours	LT	TU	LB	Prerequisites
AR201	4	2	4	-	AR102

Developing and orienting the student abilities to treat architectural design as a creation process to solve spatial problems on different levels of design (from the context and the layout to masses and spaces)/ Emphasizing the importance of construction in the formulation of inner spaces, and the architectural shape as a

framework for the functional, social and cultural needs/ Architectural projects that cover different programmers and concepts/ Architectural programmer/ Architectural form within the different concepts of space/ Understanding the dynamics of inner and outer spaces/ Architectural character and its urban, environmental, structural and symbolic references/ Dealing with structure as a constraint for the inner space and architectural form, as well as studying its organic, cultural and functional references in central-function buildings.

8.Architectural Design IV

Code	Credit Hours	LT	TU	LB	Prerequisites
AR202	4	2	4	-	AR201

Developing design skills and ability to deal with complex form generation processes and design assignments, Covering various levels of form generation, including: context, site, solids and voids manipulation, spaces, structure, architectural expression and character, Developing analytical and synthesizing abilities and communication skills, Emphasizing the importance of the setting: Environmental and socio-cultural factors in the design process, introduction and experimentation with current trends and conceptions through studio and design assignment, Multi-elements and limited scale projects.

9.Theories of Architecture I

Code	Credit Hours	LT	TU	LB	Prerequisites
AR203	3	2	2	-	AR101

Studying the philosophy and design considerations of public buildings including educational and cultural buildings, libraries, theaters, museums, healthcare facilities, recreational facilities, social centers, commercial buildings and shopping centers, as well as tourist buildings.

10.History of Architecture II

Code	Credit Hours	LT	TU	LB	Prerequisites
AR204	3	2	2	-	AR103

This course aims at studying the evolution of thoughts that shape architecture at the beginning of the European Renaissance eras – comparative studies of architectural examples from the Early Christian , Byzantine and Coptic eras in Egypt, Romanesque and Gothic architecture (Italian, French, German , English) . Studying architectural thoughts and factors that foster the emergence of the European Renaissance art and architecture, the artists of that era.

11.Building Construction II

Code	Credit Hours	LT	TU	LB	Prerequisites
AR205	3	1	4	-	AR110

Anatomy of different architectural and structural members – load transfer and loading methods, traditional construction methods, connections between different architectural and structural members – complementary items (suspended ceilings, curtain walls, light weight partitions) – reinforced concrete, steel, wooden wide span structures – new construction methods, site plotting of buildings – construction plans.

12.Building Construction & Introduction to Working Design

Code	Credit Hours	LT	TU	LB	Prerequisites
AR206	3	1	4	-	AR205

Construction details, materials selection, and methods of construction of building finishes: floors, walls, ceiling; stairs, openings, installations, specialty works. Design/detailing project. Introduction to working drawings, Axis, dimensions, finishing schedules, Staircases rules and design, wooden Windows and Doors with details and schedules, Expansion and movement joints, Retaining walls; concrete and masonry.

13.Environmental Control

Code	Credit Hours	LT	TU	LB	Prerequisites
AR207	2	2	1	-	AR102

Building as a mediator between man and the surrounding environment and through the study of the thermal environment: components of climate, parameters that affect the site climate, climatic data and representations – thermal comfort chart – solar radiation – sun path charts – shading devices and its design – heat transfer between buildings and the environment – ventilation and air movement – openings and orientation – design goals of environmental control – design methods and architectural treatments of thermal environment.

14.Interior Design

Code	Credit Hours	LT	TU	LB	Prerequisites
AR208	3	1	4	-	AR102

Introduction to interior design – visual aspects of spaces –space components :light, sound, texture, shapes, standards – Accommodation in internal space – Fixed and movable furniture – Color studies and its psychological effect – Study of various public and private interiors on selected students design projects – Presentation skills .

15.History and Theories of Planning

Code	Credit Hours	LT	TU	LB	Prerequisites
AR210	2	2	1	-	36Cr.Hr.

Human settlements – old civilizations of Egypt, Euphrates and tiger – settlement influential factors – urban centers of each - comparison of the Greek and roman civilizations with respect to civilization characteristics, practice, and urban centers of each. – Civilization and city characteristics of European medieval eras and Islamic medieval eras – industrial revolution and thoughts of the good society – introducing city planning, its goals and levels – the problems of current Egyptian cities – research training.

16.Computer Applications in Architecture

Code	Credit Hours	LT	TU	LB	Prerequisites
AR212	2	1	-	3	BS105(AR)

Introducing computer capabilities in the area of architecture and urbanism – tools, techniques and applications that can be used during different procedures of building design, starting from programming phase, design representation using Adobe Photoshop program and evaluation, preparation of 2d and 3d architectural drawings, programming and computer languages – use of computer in programming and architectural design. Introduces students to architectural design and computation through the use of computer modeling, rendering, and digital fabrication. Focus on the exploration of space- and place- making through the use of computer rendering and design construction through CAD/CAM fabrication. Students design a small building using computer models leading to a full package of physical and virtual materials, from computer generated drawings.

17.Architectural Design V

Code	Credit Hours	LT	TU	LB	Prerequisites
AR301	4	2	4	-	AR202

Architectural design of complex, wide span buildings – data collection and analysis – design of projects with multiple buildings emphasizing internal and external spatial relationships between different buildings and with the surroundings – issues of natural illumination and ventilation – artificial lighting and ventilation techniques and its application to relevant buildings – model making.

18.Architectural Design VI

Code	Credit Hours	LT	TU	LB	Prerequisites
AR302	4	2	4	-	AR301

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 conceptions.

Analytical study of design alternatives for public and residential projects, to reach architectural and urban forms & configurations together with the appropriate design alternatives to satisfy: Design, functional, structural, visual, and environmental goals.

19.History of Islamic Architecture

Code	Credit Hours	LT	TU	LB	Prerequisites
AR303	3	2	2	-	AR204

Philosophical framework of Islamic architecture – comparative analysis of a number of examples of Islamic architecture – Studying Islamic architecture in Egypt and the factors that affect its emergence and evolution during different Islamic eras.

20.Theories of Architecture II

Code	Credit Hours	LT	TU	LB	Prerequisites
AR304	3	2	2	-	AR203

Architectural trends in the 19th century as an introduction to modern architecture – Romantic architecture – The gap between architectural structuralism and the move toward eclecticism – bridging the gap in Europe and USA – Stages of philosophy and architectural development and changes during the 20th century.

21.Working Drawing I

Code	Credit Hours	LT	TU	LB	Prerequisites
AR305	3	1	4	-	AR206

Development of initial project into a complete and detailed working project. In-depth study of various methods and materials of covering wide span spaces and its details – cladding of skeleton buildings – different metal sections and their use in openings and partitions design – stair types, different designs and materials – Architectural working drawings and detailing of different projects – sanitary and electrical drawings.

22.Working Drawing II

Code	Credit Hours	LT	TU	LB	Prerequisites
AR306	3	1	4	-	AR305

Working drawings preparation (plans, sections, elevations, details, finishes, wood, and metal works), Execution stages (site works, foundations, skeleton, scaffoldings, quality control). Contemporary construction techniques/methods, Architectural/building works (partitions, curtain walls, panels), Finishing materials (bricks, timber, metals, plastics, and synthetics), Finishes (plaster, cladding, suspended ceilings, etc.) expansion and settlement joints, Admixtures, Thermal and damp proofing.

23.Environmental Design & Energy

Code	Credit Hours	LT	TU	LB	Prerequisites
AR307	2	1	-	2	AR207

The inefficient use of energy in contemporary architecture – the efficiency of energy use in traditional architecture of different climatic regions –utilization of passive solar energy applications – energy conservation concepts and recycling – modern architectural trends and the efficient use of energy in the light of energy consumption rationalization concerns.

24.Housing

Code	Credit Hours	LT	TU	LB	Prerequisites
AR308	2	2	2	-	AR309

The problem of housing in Egypt –Housing processes and approaches – Housing prototypes – Planning and designing of residential areas, the economic, social, and environmental factors that affect it – Housing project involving surveys and evaluation of an existing residential area, and utilization of the findings in designing and planning of a new housing project. Regulations and Laws governing Urbanism.

25.Urban Design

Code	Credit Hours	LT	TU	LB	Prerequisites
AR309	3	2	2	-	AR210

Study of elements and styles of urban design – Principles of design of urban spaces in cities - Factors affecting the design decisions – Visual treatments in formation of urbanized spaces and elements of urban design – Regulations and standards for systems and legislations in urban design.

26.Building Technology

Code	Credit Hours	LT	TU	LB	Prerequisites
AR310	2	2	2	-	AR206

Technology principles – productions basics – mass production – machines – time and movement – production lines – workers and machines – incentives – architectural assembling – technologies of prefabricated buildings: Basics and methods – elements and components – manufacturing, transportation, and installation – maintenance, and support – basics of maintenance of different building components.

27.Project Management (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR311	2	2	1	-	AR110

Organization, management and planning in construction: fundamentals of construction management and construction manufacture; technological-organizational

models of construction manufacture; technological-organizational designing; material support organization of construction manufacture; construction manufacture planning; organizational manufacturing forms and management structures in construction; quality control of manufacturing products; management of maintenance acceptance of completed project.

28.Humanities in Architecture (Elective 1)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR331(1)	2	2	-	-	.-

Identifying architecture as a framework for human science/ Understanding human considerations and concepts related to architectural design which can be considered as an approach for design based on human and behavioral needs/ Historic background/ Fundamentals of different theories/ Formation of communities/ Man-environment relationship/ Perception, behavior and culture/Mutual interrelationship between behavior and built environment/ Special human needs in relation with social thoughts/ Human needs in modern architecture/ Scientific methodology of testing models, collecting data, and different methods of analysis/ Training the student to proceed a practical

29.Visual Drawing & Colors (Elective 1)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR332(1)	2	2	-	-	72Cr.Hr.

The goal of this Art class is to help you see in a new way, which will then enable you to translate your visual perception into a two dimensional drawing. We will explore drawing through different exercises including fundamentals such as line, value, composition and the use of color. We will explore the basics of color theory, learn about certain color meanings and how colors can alter mood and provoke tension through their different combinations. Many of the drawings will incorporate oil pastels, ink, watercolor, and colored pencil. In keeping with the theme of “nature” we will spend time outside sketching and finding some of our own drawing objects and materials.

30.History and Theories of Restoration and Conservation (Elective1)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR333(1)	2	2	-	-	72Cr.Hr.

Introduction – Conservation Theories – Historical background – Endowment system in Egypt – International Conservation and Restoration charters – Rules and Implementation of conservation project in Egypt – Classification and Protection of Architectural Heritage – Conservation terminology .

31. Form and Aesthetics in Architecture (Elective 1)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR334(1)	2	2	-	-	72Cr.Hr.

Introduction – Recognizing aesthetic of architectural form – Studying the theories of aesthetics in art and architecture - Aesthetic Values – Structure of form – The structure Unit – Surface organization of space – Dynamic spaces – Equilibrium in Architecture and Landscape – Environmental aspect – Local and International applications – Conscious design of spaces – Visual perception of spatial configuration – Researches and applications.

32.Advanced Computer –Aided Architectural Design (Elective 1)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR335(1)	2	2	-	-	72Cr.Hr.

Introduction and application of advanced 3D Max concepts. Real time computer graphics. Computer applications for performance Still images, virtual reality and interactivity. Alternative inputs and displays. Modeling, texture mapping, environments, navigation, lighting and Rendering . Generative design and Avatars. Computer Applications in Design and Presentation.

33.Architectural Design VII

Code	Credit Hours	LT	TU	LB	Prerequisites
AR401	4	2	4	-	AR302

Familiarizing the students with different design approaches – analytical study of different design alternatives for public and residential projects aiming to reach the best possible alternative with respect to architectural and urban form as well as different functional, structural, visual, and environmental requirements, yet respecting urban control legislations – Real projects of urban dimension and complex design alternatives – different methods of project presentation – model making.

34.Working Drawing III

Code	Credit Hours	LT	TU	LB	Prerequisites
AR403	4	2	4	-	AR306

Preparation of a complete set of working drawings applicable in reality or a previously designed student project involving wide spans space.

35.Quantities & Specifications

Code	Credit Hours	LT	TU	LB	Prerequisites
AR402	3	2	2	-	AR305

Training the student to prepare a complete set of working documents – bids –quantity calculation of different items – field quantity calculation and payment methods - specifications - cost analysis for materials and labor – timetables and the critical path method – use of computer in preparation or specification sand bills of quantities – building legislation, regulations and conditions - applications.
Calculations of Quantities: Excavation and Filling Quantities- Calculation of Plain and Reinforced Concrete and Steel Reinforcement Quantities- Calculation of Brick Walls Quantities- Calculation of Isolation Quantities- Cost Estimate- Final Invoice - Specifications; Types of Specifications - Specification Items and Their Uses - Methods of Formatting the Specifications for Different Works (Brickwork, Concrete, Isolation, Insulation) - Types of Contracts and Judgment.

36.URBAN PLANNING

Code	Credit Hours	LT	TU	LB	Prerequisites
AR405	3	2	2	-	AR210

Theories of Urban Planning, Urban planning origins, Industrial revolution impact on urbanization, Utopias, City beautiful movement, Theories of urban structure, Garden city, the planning process. Planning, development, and settlement – general and skeleton planning of the city: process and stages of general plan preparation, physical, economical, demographic, and social studies – the legislative framework – current conditions: the urban skeleton, land uses, problems, resources, obstacles – Goals and objectives – planning alternatives – evaluation and selection – means of execution and follow up – settlement studies – planning studies of different city elements and components –Theoretical and practical concepts of urban upgrading, improvement and community development.

37.LANDSCAPE

Code	Credit Hours	LT	TU	LB	Prerequisites
AR407	3	2	2	-	AR309

Identifying the outdoor space/ The historic evolution of gardens and parks/ Elements of landscape (plants, forms and levels of ground, water, light construction, flooring, outdoor furniture)/ Visual relationship/ Selecting materials/ Social and physiological factors that affect landscape/ Fundamentals of landscape. Learn how to create outdoor spaces that show an understanding or and response to human needs and ecological systems. Begin to develop a design ethic that recognizes the meaning and symbolism of the landscape so that your designs have spiritual and philosophical content as well as aesthetic and functional ones.

38.VISUAL DESIGN (ELECTIVE 2)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR441(2)	2	2	-	-	109Cr.Hr.

Recognizing aesthetic aspects of architectural forms within the study of aesthetics theory and intellectual approaches in art – Creation in the design process – Visual perception for spatial forms – Visual treatment in formulating urban spaces, elements of design, design standards and systems – Basics of visual design.

39. Interior Design Principles (Elective 2)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR442(2)	2	2	-	-	109Cr.Hr.

Historical background. Concepts and principles of interior design. Space planning and design. Human perception. Color and lighting. Materials selection. Function, material and construction of furniture and textiles. Design for the disabled. Ergonomics and design. Design drawing and detailing.

40.Architectural Legislations (Elective 2)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR443(2)	2	2	-	-	109Cr.Hr.

Covers several issues : The urban planning legislation as well as building and housing legislation – General and detailed planning of cities and villages – vacant land subdivision, industrial areas and city center instructions – counties renovation and environmental upgrading criteria – different housing specifications , criteria , and levels – road width , building density , and heights – Illumination and ventilation – design criteria for internal and external courts – Stair and projection regulations – Architectural applications covering urban control legislation in Egypt .

41. Town Planning (Elective 2)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR444(2)	2	2	-	-	109Cr.Hr.

Introduction and scope of Down Planning principles. Modern trend in town planning, statistics . Zoning, land use, open spaces landscaping, services. Types of design, grid iron, gardening, orientation. Downtown features, high rises, function value. Image of a city, skyline, land marks, visual aesthetics. District, neighborhood, design method, computations, proposal standards (residential neighborhood).

42. Computer Application in Architecture (photoshop) (Elective 2)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR445(2)	2	2	-	-	109Cr.Hr.

Introduction and application of Photoshop principal’s .The aim of this course is to explore current Photoshop program and develop skills in the use of specialist Photoshop presentation in all branches of Architecture. At the end of the course, the students will understand a variety of terms and terminology of Photoshop program and learn how to present their Architecture drawing products and their final projects.

43.Technical Drawing for Design (Elective 3)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR451(3)	2	2	-	-	-

The focus of this course is to introduce students to the requisite skills of free-hand manual drawing for designers. The course is composed of three primary modules covering the conceptual, technical and media related aspects of free-hand drawing as part of the design process, from first conceptualization and diagramming to drawing from observation through final rendering and representation.

44.Conservation of Historic Areas (Elective 3)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR452(3)	2	2	-	-	128Cr.Hr.

Description of historic area liable to conservation . International and national examples of historic areas.

The course introduces the students to the field of historic preservation covering issues from the history of the field, the development of its theories, the different levels of intervention. It also provides an overview on the technical conservation matters covering a brief on the traditional building techniques, and the compatible approaches to conserve historic buildings. It develops a critical approach towards the current practice, and opens a discussion on the means to enhance and to appropriate conservation methods according to the cases.

45. acoustic in architecture (Elective 3)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR453(3)	2	2	-	-	128Cr.Hr.

Fundamentals of acoustics-Terminology: speed of sound, frequency, wavelength, sound levels-Wave equation in fluids-Human hearing and basic psychoacoustics-Sound propagation-In free field-Boundary interaction-Basic room acoustics-Modal theory-Reverberation time-Material properties-Measurement techniques-Noise control in buildings-Noise criteria-Air-borne sound insulation- Structure-borne sound insulation (impact noise, vibration isolation)-HVAC noise control.

46.Advantage Study on Sustainability in Engineering and Architecture Design (Elective 3)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR454(3)	2	2	-	-	128Cr.Hr.

Basic principles and application of advantage analysis and study -. Performance of building envelop materials and assemblies - Sustainable design principles and applications. Green House new direction on sustainable architecture .
Written to emphasize the importance of education and collaboration between engineers and architects with regards to Sustainable / Green construction.

Promote the development of domestic / international educational opportunities .

47.Building Technology and Advanced Construction System (Elective 3)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR455(3)	2	2	-	-	128Cr.Hr.

The course aims at identifying advanced building systems and their applications, studying the techniques of in-site and in-factory industrialization, studying the economics of application and execution of different construction systems (traditional, developed, industrialized and pre-cast) – Basics of selecting construction system – Possibilities of interfering among systems – Design – Manufacturing and execution – Economics of design and preparing documents – Feasibility – Flexibility – Flexibility of design – Finishing – Economics of contracting and alternatives of put project into execution Building economics .

48.Architecture Criticism and Project Evolution (Elective 4)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR461(4)	2	2	-	-	128Cr.Hr.

Definitions and conception –Approaches of architectural criticism – Nature, function and importance of architectural criticism – Criticism and evolution in design process, the outcomes – The concept of multiplicity in architectural directions, and theoretical approaches for contemporary architectural conception – Studies of the fundamentals of architectural criticism and elements of preferring among architectural projects to achieve logic judgment on architectural and urban project . Models, applications and case study.

49.Architecture for Hot Climate Region (Elective 4)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR462(4)	2	2	-	-	128Cr.Hr.

Study of hot regions – Hot dry climate – Environmental control in desert regions - Design methods in desert regions – Environmental heritage architecture – Architectural design for project in desert area .

50. urban landscape (Elective 4)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR463(4)	2	2	-	-	128Cr.Hr.

This course explores landscape design theories and application in the urban context. It looks at site structure relationships for private buildings, urban open spaces, plazas, pedestrian malls and other public spaces. Case studies will be used to apply and develop these principles under the supervision and guidance of the instructor.

The course aims to introduce students to the concept of landscape architectural design theories and applications on different scales of urban environments.

The topic: Perception of urban landscape. Structure of urban space. Development of spatial order. Radial and Neoclassic form

51.Renovation and Urban Development (Elective 4)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR464(4)	2	2	-	-	128Cr.Hr.

Approaches and concepts of renovation and Urban Development, emphasizing the maximal benefit from the human and urban resources available in the existing built environment – introduction to development and improvement experiments – analysis of urbanism in the existing cities, problems of existing urbanism – reasons and characteristics for decay – social and economic aspects – techniques and methods of dealing with different urbanism situation – process of renovation, improvement and urban development – rehabilitation – preservation and maintenance – examples and case studies .

Regional and Contemporary Architecture (Elective 4)

Code	Credit Hours	LT	TU	LB	Prerequisites
AR465(4)	2	2	-	-	128Cr.Hr.

Recognizing the origins and historic roots of local Egyptian architecture – Emphasizing the influence of cultural communication on the architectural conception – Identifying factors that affect the Egyptian architectural conception – Alienation of Egyptian architecture – Social , cultural , and economic dimensions .

52.Graduation Project

Code	Credit Hours	LT	TU	LB	Prerequisites
AR499 I	3	-	6	-	AR302-AR306-133Cr.Hr.-CGPA 2
AR499 II	6	-	12	-	AR401- AR403-AR499 I

NOTE: IN CASE OF FAILING (AR499II) THE STUDENT MUST REPEAT (AR499I) ALSO

Demonstrate Knowledge and undesrstanding of the graduation project aims , program, architectural items and planning aspects .

Identify the site analysis (topography , climate , surroundings and environmental factors).

Understanding how to analyze similar projects through studying international case studies and how to criticize the advantages & disadvantages of each .

Understanding how to write a technical report for the graduation projects to be as a design guideline for the designing process of line graduation projects .

DURING THE FIRST SEMESTER (AR499 I)

Designing of graduation project for which the student had prepared a program and chose a location during the first semester.

DURING THE SECOND SEMESTER (AR499 II)

A continuation of part I **(AR499 I)** . Comprehensive architectural design demonstrating an understanding of the different conceptual and technical aspects of architecture .

The project should be both complex and comprehensive to show student ability to utilize the experience gained during the study period in the department. The student should be able to meet project objectives both at the design level and the urban level.

53.Computer Applications in Engineering (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
BS105	2	1	-	3	BS006

The aim of this course is to explore current CAD technologies and develop skills in the use of specialist CAD software to produce 2D and 3D design specifications, to transform CAD drawings into photo realistic virtual products and to gain an awareness of CAD data and how such information can be transformed to engineering drawings. At the end of the course, the students will understand a variety of terms and terminology as applied to CAD technology; demonstrate the use of an industry stand operating system to create stand CAD packages for 2D and 3D design drawings. The topics of this course: The role of computers in the design stage . 2D and 3D drawings for given project. Realistic and non-realistic rendering techniques. Building Information Models (BIM).

54.Properties of Materials (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
CE111	2	2	1	-	18Cr.Hr.

Introduction to Construction Materials - Non-Metallic Construction Materials: Building Stones, Bricks, Timber, Lime, Gypsum, Plastics, Insulation, Glass and Ceramics - Metallic Building Materials – Concrete Materials – Concrete Manufacturing – Concrete Properties – Special Types of Concrete

55.Plane Surveying (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
CE112	2	2	-	1	18Cr.Hr

Introduction – Scales – Verniers – Linear measurements – Simple instruments for angles measurement – Chain surveying – Leveling – Theodolite surveying – Map construction – Principles of photogrametry – Photogrametric applications in architecture.

56.Structural Analysis (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
CE113	2	2	1	-	BS007

Calculation of reactions, shear and bending moments in simple, restrained and Continuous beams due to fixed and moving loads, Simple trusses with fixed &

Moving loads, Determinate frames, Deflection, Statically indeterminate Structures, Computer applications & validation.

57.Reinforced Concrete (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
CE114	2	2	1	-	CE113(AR)

Introduction to the Mechanical Properties of Concrete and Steel- Load Distribution on Beams- Design of Section under Bending- Shear Stresses- Details of Reinforcement for Beams - Design of Solid Slabs and Details of Reinforcement- Design of Sections subjected to Torsion- Working Limits of Concrete Beams- Design of Sections under Eccentric Loading- Design of Columns and their Detail of Reinforcement- Paneled Beams.

58.Steel and Wood Construction (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
CE215	2	2	1	-	CE113(AR)

Wooden and Metallic construction materials: types and specifications – Allowable stresses in design calculations – Design of connections (rivets, bolted and welded) – Design of structural members and drawings of construction details for sections and connections of simple; composite and built up cross sections for: columns; tie beams under simple and bio axial bending and torsion.

59.Soil Mechanics & Foundations (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
CE216	2	2	-	1	36Cr.Hr.

Soil properties - Soil classification - Stress transfer through soils – Soil Consolidation – Earth pressure – Design of shallow foundations – Pile foundations – Bearing walls – In-site soil investigations and selection of adequate foundation type.

60.Technical and Sanitary Fixtures (AR)

Code	Credit Hours	LT	TU	LB	Prerequisites
CE217	2	1	2	-	AR205

Introducing energy and the thermal field – environmental influences – thermal transfer, storage, and insulation – air conditioning and ventilation – mechanical ventilation – heating system – artificial lighting – vision mechanisms – acoustics: nature of sound, sound analysis, noise, acoustical design of buildings and spaces – electrical installations: costs, maintenance, and systems integration – basics of elevator installation and its architectural requirements – laundry and kitchen equipment – hydraulic services: water supply and drainage – waste water and rain water – sanitary equipment in buildings – problems and solutions – firefighting requirements – solid waste disposal – architectural applications