3C. Architecture Engineering Course Descriptions

3C.1. University and faculty Requirements' Courses

(Refer to Section # 2)

3C.2. Architecture Engineering Specialty Courses

ARC213	Architectural Design 1	4 CH (2,4,0)
Course Contents	The main concern and focus of this course are 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 a pavilion in a public garden, a bus station, a sightseeing kiosk, a small or medium span exhibition hall, and similar ones.	
Prerequisite (s)	EMP111	
Textbook	Unwin, Simon: *Exercises in Architecture: Learning to think as an Architect*, Routledge, 2012	
Lab./Computer work/Project	--	

ARC214	Architectural Design 2	4 CH (2,4,0)
Course Contents	The main concern and focus of this course are the "Creativity and Functionality" through a notion of a Problem-Solving design process. The design process will be approached as a method of finding solutions for small scale functional, environmental, and structural problems. 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 a Celebrity Residence, a Vacation House, an Exploration Center, a Kindergarten, Kids' Arts Center, Children's Library/Museum and similar projects.	
Prerequisite (s)	ARC213	
Textbook	Neufert, E.: *Architects' Data; The Handbook of Building Types*, Third Edition, Blackwell Publishing, 2002, The Alden Group Ltd., Oxford & Northampton, metric edition.	
Lab./Computer work/Project	Emphasis on: **Creativity within Functionality**	

ARC223	History & Theories of Architecture 1	3 CH (3,0,0)
Course Contents	The course focuses on creative thinking methods based on writings of "Edward De Bono". Elements and principles of design, relation between form and space, defining a space, circulation spaces and their characteristics. The course also addresses different historical issues in different periods, Ancient Egyptian - Mesopotamia - Greek - Roman - Early Christianity - Byzantine - Renaissance - Baroque and Rococo.	
Prerequisite (s)	None	

Textbook	*Ching, Francis D.K., *Architecture Space, Form, and Order*. 2014 * Fletcher, Banister. *"A History of Architecture"***.** London: The Royal Institute of British Architects.
Lab./Computer work/Project	--

ARC233	Graphics & Visual Skills	3 CH (2,3,0)
Course Contents	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, using free hand. Architectural presentation, Shade and shadows of a dot, a line, a surface, and a volume, Shade and shadow of buildings in plans, elevations, perspectives and layouts. Architectural perspective, one and two vanishing point perspectives.	
Prerequisite (s)	EMP111	
Textbook	- Rendow Yee, *Architectural Drawing a Visual Compendium of Types & Methods*, Wiley & Sons, 2013 - Montague, John – *Basic Perspective*: A visual Approach – 3rd Ed. N.Y.: Wiley & Sons, 1998.	
Lab./Computer work/Project	--	

ARC243	Building Construction & Materials 1	3 CH (1,4,0)
Course Contents	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.	
Prerequisite (s)	EMP111	
Textbook	Minke, Gernot*: Building with Earth*, 3rd. Ed.	
Lab./Computer work/Project	--	

ARC244	Building Construction & Materials 2	3 CH (1,4,0)
Course Contents	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.	
Prerequisite (s)	ARC243	
Textbook	Chudley, Roy & Greeno, Roger: *Building Construction Handbook*, 10th Ed.	
Lab./Computer work/Project	--	

ARC315	Architectural Design 3	4 CH (2,4,0)
Course Contents	The main concern and focus of this course is the "Environmental/Site Considerations" affecting the design decisions. The course will introduce the concept of 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: A Students Hostel, Youth Camp, Tourist Village, Gated Residential Community, and other similar ones.	
Prerequisite (s)	ARC214	
Textbook	Neufert, E.: *Architects' Data; The Handbook of Building Types,* Third Edition, Blackwell Publishing, 2002, The Alden Group Ltd., Oxford & Northampton, metric edition.	
Lab./Computer work/Project	Emphasis on "**Site Considerations**"	

ARC316	Architectural Design 4	4 CH (2,4,0)
Course Contents	The main concern and focus of this course is the different methods of "Structure as a Form Generator". The priority will be for using advanced structural 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: Design Center, Club House, Religious Complex, Rest House, Bus/railway Station, Indoor Sports Hall, small scale sports Halls and Stadia and other similar ones.	
Prerequisite (s)	ARC315	
Textbook	Charleson; Andrew: *Structure As Architecture*: A Source Book for Architects and Structural Engineers 2nd Edition.	
Lab./Computer work/Project	Emphasis on "***Structure as a Form Generator***"	

ARC326	Human Studies in Architecture	2 CH (2,0,0)
Course Contents	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.	
Prerequisite (s)	None	
Textbook	Applications of Environmental Research: Case studies and Analysis (Environment and Behavior), Cambridge University Press 1993.	
Lab./Computer work/Project	--	

ARC345	Building Construction & Materials 3	3 CH (1,4,0)
Course Contents	The course focuses on the advanced construction systems and execution methods. The course covers 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.	
Prerequisite (s)	ARC244	
Textbook	Angel, Heino, *Structural Systems*, 3rd edition, 2007	
Lab./Computer work/Project	--	

ARC346	Building Construction & Materials 4	3 CH (1,4,0)
Course Contents	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.	
Prerequisite (s)	ARC245	
Textbook	Chudley, Roy & Greeno, Roger: *Building Construction Handbook*, 10th Ed, Routledge, NY, 2014	
Lab./Computer work/Project	--	

ARC363	Environmental Control & Technical Installations	3 CH (2,3,0)
Course Contents	Defining the environment and its components, Energy and the thermal environment, Thermal comfort criteria and indices, Heat transfer and insulation, Air conditioning and ventilation, Hydraulic services, water supply, Plumbing and Sanitary fixtures and installations, Firefighting, Solid waste disposal, Natural lighting, artificial lighting and fixtures installation, Nature of acoustics, Sound analysis, room acoustics, Acoustic design and noise control.	
Prerequisite (s)	None	
Textbook	* Bauer, Michael, Peter Mösle, and Michael Schwarz. *Green building: guidebook for sustainable architecture*. Springer Science & Business Media, 2009. * Descottes, Hervé, and Cecilia E. Ramos. *Architectural lighting: designing with light and space*. Princeton Architectural Press, 2013.	
Lab./Computer work/Project	--	

ARC331	Computer-Aided Drafting	2 CH (1,0,2)
Course Contents	This course teaches students how to draw using computers as a tool for drafting and visualization. It teaches students objects creation, editing and drawing accuracy in 2D and 3D, how to model any object, how to render it using different techniques, scenes, materials and mapping.	
Prerequisite (s)	CSC 101	

Textbook	Michael Brightman: The SketchUp Workflow for Architecture: Modeling Buildings, Visualizing Design, and Creating Construction Documents with SketchUp Pro and Layout. John Wiley & Sons, 2013
Lab./Computer work/Project	Using different Computer drafting, modeling and rendering tools.

ARC371	Building Information Modeling	2 CH (1,0,2)
Course Contents	This course teaches how to set up a project, establish structural grid lines, reference lines and start setting up structural columns. Student will also learn how to install walls, how to customize elements, how to use the curtain walls tool and how to create slabs, stairs and roofs. At the end of the course the student will examine how to develop details and will create a parametric 3d component.	
Prerequisite (s)	ARC301	
Textbook	Stefan Mordue et al., *Building Information Modeling for Dummies*, John Wiley & Sons Ltd. 2016	
Lab./Computer work/Project	Using REVIT for drawing and modeling	

3C.3. AE Program Sub-Specialty Courses

ARC317	Architectural Design 5	4 CH (1,6,0)
Course Contents	The course aims to focus on "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 architectural and urban spaces. The course projects may be: A Research Center, Technical School, Museum, Echo Tourism, and other similar ones.	
Prerequisite (s)	ARC301	
Textbook	*Environmental Design; An introduction for architects and engineers* – 3rd edition – by Randall Thomas.	
Lab./Computer work/Project	Emphasis on: "**Environmental Design**"	

ARC326	History & Theories of Architecture 3	2 CH (2,0,0)
Course Contents	An introduction to the theories and philosophies of the International Style of the 20th Century and the Modern Movement; The organic theories of Sullivan and Wright, The Functional formalism of Le Corbusier, the Functional Technological Theories of the Bauhaus and Gropius, the structuralism of Mies Van Der Rohe, and the expressionism of Mendelson. Also an introduction to design standards, concepts and considerations of office buildings, cultural and civic centers, and health facilities.	
Prerequisite (s)	ARC324	

Textbook	Charles Jenks: *The story of Post Modernism: Five Decades of the Ironic, Iconic and Critical in Architecture*, 2011, John Wiley & Sons, United Kingdom.
Lab./Computer work/Project	Emphasis on: "**Futuristic Architecture**"

ARC351	**Urban Planning 1**	**3 CH (2,2,0)**
Course Contents	The course gives a background on the urban and city planning history, starting from the ancient Egyptian civilization, Greek and Roman civilizations, Mesopotamian civilizations and other historical periods. The course illustrates the different urban fabrics and how to define them. It also explains the city and its components and the strategic urban planning methodology and process, including the planning surveys, analysis of problems, constraints and potentials, setting alternatives, services studies, land use planning and making the strategic master plan. The course also illustrates the different approaches for dealing with the deteriorated and informal areas. The course applies most of these concepts through a practical project that usually selects a specific district within the city and attempts to make an upgrading process through urban planning	
Prerequisite (s)	As Advised	
Textbook	Weber, R. and Randal, C, *The Oxford handbook of Urban Planning*, Oxford, 2015.	
Lab./Computer work/Project	--	

ARC373	**Execution Design 1**	**3 CH (1,4,0)**
Course Contents	The course addresses the basics of drafting working drawings. Students will learn how to deal with dimensioning and coding systems. They will also practice coordination between architectural, structural, and electromechanical needs. Their practice will be on a small to medium scale project.	
Prerequisite (s)	ARC371 + ARC346 + ARC 363	
Textbook	Fred Slitt: *Working Drawing manual*, 1998, McGraw Hill	
Lab./Computer work/Project	--	

ARC418	**Architectural Design 6**	**4 CH (1,6,0)**
Course Contents	The main concern and focus of this course is "Futuristic Architecture". Students will be asked to think and imagine how *Architecture* will be in 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: Virtual Museum, Floating City, Intelligent Responsive House, and other similar ones.	
Prerequisite (s)	ARC317	

Textbook	Kushner; Marc.: *The Future of Architecture in 100 Buildings*, Simon & Schuster UK, 2015
Lab./Computer work/Project	Emphasis on: "**Futuristic Architecture**"

ARC419	**Architectural Design 7**	**4 CH (1,6,0)**
Course Contents	The course focuses on the 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 and complex relationships. Provision of natural lighting and ventilation, and application of new technologies to enhance design concepts, are important issues in the course.	
Prerequisite (s)	ARC418	
Textbook	Reid Ewing and Otto Clemente: *Measuring Urban Design Metrics for Livable Places***,** Island Press, 2000 M St. NW Suite 650, Washington, 2013	
Lab./Computer work/Project	Emphasis on: ***"Contextual Design"***	

ARC427	**History & Theories of Architecture 4**	**2 CH (2,0,0)**
Course Contents	The course traces the development of architectural thought in the 2nd half of the 20th Century and its effect on Architecture, Post-modernism, Deconstructionism, Future trends in architecture. The course also discusses concepts and considerations of educational buildings, Transportation buildings and tourist facilities.	
Prerequisite (s)	ARC326	
Textbook	Meiss; Pierre von: *Elements of Architecture: From Form to Place***,** 1990	
Lab./Computer work/Project	--	

ARC452	**Urban Design & Housing 1**	**3 CH (2,2,0)**
Course Contents	Introduction to Urban Design, Housing and related fields, Relevance of contextual design, History and development of urban form and housing. An introduction to site planning and design principles, Elements, Processes and products. Examples and application of Local and international case studies.	
Prerequisite (s)	ARC315	
Textbook	-Matthew Carmona, Tim Heath, Taner Oc, Steve Tiesdell, *Public Places - Urban Spaces: The Dimensions of Urban Design*, Boston: Architectural Press, (2003). -Kevin Lynch: *The Image of the City*, MIT, 1960	
Lab./Computer work/Project	--	

ARC453	Landscape Architecture	3 CH (2,2,0)
Course Contents	Introduction and Definitions, Landscape processes, Landscape graphics, Basic elements of design, Visual elements of landscape design, Contemporary theories, Sustainability, Regional landscapes, Application through project study, Classification of plants, Significance of plants in the landscape, Plant materials as resources and design elements, Ecological factors, Economic factors, Sustainable planting design, Vegetation of Egyptian environments, Principles of planting design in semi-arid environments, Applications.	
Prerequisite (s)	ARC315	
Textbook	Norman K. Booth: *Basic Elements of Landscape Architectural Design*, Ohio State University, Waveland Press, INC, Illinois, 1990.	
Lab./Computer work/Project	--	

ARC454	Urban Planning 2	3 CH (2,2,0)
Course Contents	The course explains the different concepts of the region, the regional problem and why regional development is conducted. It also explains the different approaches for regional development. The course focuses on the different types of regions in Egypt and the planning structure of the country. It further explains the special importance of border regions and how to conduct regional urban development among them. The course shows how to plan a new city, and how to select the proper location for this city within the region, while defining its economic activities. The course applies these concepts through a practical project of making a strategic plan for a region or sub region in Egypt, and planning a new city within the new regional plan showing the difference between structural planning and master planning through the planning process of the cities.	
Prerequisite (s)	ARC351	
Textbook	Hall, P.: *Urban and Regional planning*, Routledge, 2010	
Lab./Computer work/Project	--	

ARC455	Urban Design & Housing 2	3 CH (2,2,0)
Course Contents	The course develops students' appreciation of the importance and scope of the Urban Designer in shaping the built environment, and how to differentiate between the different levels of Urban Planning and Design It also focuses on Housing and development of housing areas, Housing development: processes, Analysis and shaping of housing areas; Analysis, assessment and design of housing types and patterns, Completed and incremental housing development, Site planning, Socio-economic aspects of housing.	
Prerequisite (s)	ARC452	
Textbook	Carmona, Matthew, Taner Oc. Et al: *Public Places - Urban Spaces: The Dimensions of Urban Design*, Boston : Architectural Press, (2003).	
Lab./Computer work/Project	--	

ARC474	Execution Design 2	3 CH (1,4,0)
Course Contents	The course focuses on detailing the execution and construction issues. Sketches and diagrams are needed to clarify all main stages of design and execution details. Students are required to research and investigate the different roles of material in design. In addition, students will learn how to write technical specifications of building/construction items. Their practice will be on a medium-scale project.	
Prerequisite (s)	ARC373	
Textbook	Edward Allen, Joseph Iano: *Fundamentals of Building Construction: Materials and Methods*, 5th Edition	
Lab./Computer work/Project	--	

ARC475	Execution Designs 3	3 CH (1,4,0)
Course Contents	The course focuses on the preparation of complementary execution documents for projects, including Quantity surveying, Analysis of bids, Cost analysis, Shop and as built drawings. The practice will be on a medium-scale complex project.	
Prerequisite (s)	ARC474	
Textbook	Slitt; Fred. *Working Drawing manual*, 1998, McGraw Hill	
Lab./Computer work/Project	--	

ARC491	Graduation Project Studies	2 CH (2,0,0)
Course Contents	The course aims at preparing the preliminary studies to the final design studio (the Graduation Project) that should deal with and present a solution for a real-life problem, it 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. 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.	
Prerequisite (s)	ARC418 + ARC427 + ARC452 in addition: Student must have successfully completed 116 CH	
Textbook	Pena, W., Parshall, S. and Kelly, K., *Problem Seeking; An Architectural Programming Primer*, AIA Press, Washington, USA.	
Lab./Computer work/Project	--	

ARC492	Graduation Project	5 CH (1,7,0)
Course Contents	The final design studio deals with a complex design real-life 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.	

Prerequisite (s)	ARC419 + ARC491
Textbook	Recommended Readings: a) Neufert, *Architects' Data*. b) Time Saver Standards, Handbook. c) Architectural Magazines and Projects. d) Internet Resources that highlight design concepts of complex projects.
Lab./Computer work/Project	Emphasis on: ***"Real-Life Projects"***

GENx12	**Engineering Ethics & Legislations**	**2 CH (1,2,0)**
Course Contents	Laws and legislations concerning engineering works. It concerns Engineers Syndicate, Contractors, Industrial safety and security fire conditions. Lifts conditions, environmental protection against pollution, insurance against fire, accidents, and other hazards; Law of investment; relation between owner and tenant. Job laws, Industry union laws, and Engineering Ethics.	
Prerequisite (s)	None	
Textbook	C. Harris, M. Pritchard, M. Rabins, "ENGINEERING ETHICS: Concepts and Cases"; Wardsworth	
Lab./Computer work/Project	--	

EMP215	**Mathematics, Statistics & Computers**	**2 CH (1,1,1)**
Course Contents	The course provides the students with the basic concepts of Mathematical statistics and application with Statistical Programs e.g. "MINITAB" and "EXCEL" and to make them able to develop an understanding of mathematical statistical concepts.	
Prerequisite (s)	EMP112	
Textbook	Bluman, A. G., Elementary Statistics; A Step by Step Approach, Wm. C. Brown Publishers, 1992	
Lab./Computer work/Project	--	

Courses from Structural Engineering & Construction Management

SCM216	Theory of Structures	2 CH (1,2,0)
Course Contents	Equilibrium, stability & compatibility, External & internal equilibrium of statically determinate plane structures: beams, frames & trusses, Normal, shear, tensional stresses & combined stresses, Elastic deformations, Introduction to the analysis of statically indeterminate structures through consistent deformations & moment distribution, Buckling of columns, Introduction to space structures.	
Prerequisite (s)	EMP130	
Textbook	R.C.Hibbeler: *Structural Analysis*, 8th edition, Pearson Education Inc., 2005	
Lab./Computer work/Project	--	

SCM218	Properties & Strength of Materials	2 CH (1,1,1)
Course Contents	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.	
Prerequisite (s)	None	
Textbook	-The Egyptian Code of Practice of Design and Constructions of Concrete Structures (EC-203). - A.M.Neville and J.J.Brooks: *Concrete Technology*, Pearson Education. ISBN 10:8131705366 / ISBN 13: 9788131705360 - P.K. Mehta and Pauli J.M. Monteiro: *Concrete Microstructure, Properties and Materials.* McGraw Hill	
Lab./Computer work/Project	--	

SCM224	Surveying	2 CH (1,1,1)
Course Contents	Basic elements of surveying and their architectural applications, plotting scales, verniers, linear and simple angular measurement devices, Chain surveying, Leveling & theodolites, Map drawing, Photogrammetry and its architectural applications.	
Prerequisite (s)	None	
Textbook	-Students Lecture Notes -Handouts	
Lab./Computer work/Project	--	

SCM318	Reinforced Concrete & Foundations for Architects	3 CH (2,2,0)
Course Contents	Design principles of concrete, Fundamentals of reinforced concrete structures, Analysis and design of sections subjected to bending, Loads and load distribution, Reinforcement details of beams, Solid slabs, Columns, Stairs, Statically determinate frames, Ribbed and hollow block slabs, Paneled Beam slabs, Flat slabs. Soil Characteristics and Mechanics, 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.	
Prerequisite (s)	SCM216	
Textbook	-The Egyptian Code of Practice of Design and Constructions of Concrete Structures (EC-203). -Das, B.M.; Principles of Foundation Engineering, CA 93950	
Lab./Computer work/Project	--	

SCM319	Steel Structures for Architects	3 CH (2,2,0)
Course Contents	Design principles of steel structures, Structural systems, Design loads, Design of members subjected to axial forces or shear, Design of bolted and welded connections, Structural details for trusses and frames, Details of connections for exterior and interior use.	
Prerequisite (s)	SCM216	
Textbook	*The Egyptian Code of Practice of Design and Constructions of Steel Structures.*	
Lab./Computer work/Project	--	

3C.4. Architectural Engineering Elective Courses' Contents:

The department offers 4 "POOLS" of Electives under which there are 5 "groups" of different interests categorized as follows:

Group 1: Computer Oriented
Group 2: Aesthetics & Design
Group 3: Extra Curricular Skills Building
Group 4: Urbanism
Group 5: Building Technology

POOL no. 1:

ARCE11	Modeling & Rendering by Computers (From Group 1)	2 CH (1,1,1)
Course Contents	Students in this course demonstrate proficiency in many computer software programs. Students learn drafting, drawing editing and 3-D image creation using various procedures. Upon course completion, candidates should be able to select the appropriate software application for the task at hand and create models from start to finish, using any of the available software programs.	
Prerequisite (s)	As Advised	
Textbook	Vaughan,W., 2012, *Digital Modeling*, New Riders.	
Lab./Computer work/Project	--	

ARCE12	Architectural Aesthetics & Criticism (From Group 2)	2 CH (1,2,0)
Course Contents	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.	
Prerequisite (s)	As Advised	
Textbook	• Yannar Hassan Jeddou, 1993, *Modern Thought and Architecture*, Beirut, Dar al-Talibah for Printing • Peter F. Smith: *The Dynamics of Delight: Architecture and Aesthetics*, Routledge, 2003	
Lab./Computer work/Project	--	

ARCE13	Photography & Movie Making (From Group 3)	2 CH (1,1,1)
Course Contents	The focus of this course will be to explore the medium of photography and film for the practice of understanding and communicating architecture. The core techniques of architectural photography and cinematography along with editing software will be learned to create a film. The students will learn how to explore and manipulate the variables of time, motion and light with the medium of digital video to illustrate the design qualities of their projects.	
Prerequisite (s)	As Advised	
Textbook	Cammarano, A, 2017: *Architectural Photography: Digitally Produced, Digitally Displayed*.	
Lab./Computer work/Project	--	

ARCE14	Environmental Impact Assessment (From Group 4)	2 CH (1,2,0)
Course Contents	This course introduces the methodology of environmental impact assessment (EIA) as a vital tool for environmental management and decision-making. The course provides an overview of the concepts, methods, issues and various forms and stages of the EIA process. It draws on selected case studies of EIA. Different levels and systems of EIA are examined to highlight the diversity of approach and impact of the EIA process.	
Prerequisite (s)	As Advised	
Textbook	Angus Morrison-Saunders, 2018: *Advanced Introduction to Environmental Impact Assessment.* Edward Elgar Pub.	
Lab./Computer work/Project	--	

ARCE15	Architectural Preservation & Restoration (From Group 5)	2 CH (1,2,0)
Course Contents	Criteria for the selection of heritage buildings - 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 - Method of preparing a restoration plan (photographic documentation, damages and cracks, architectural drawings, philosophy of preservation, restoration project and a plan of restoration).	
Prerequisite (s)	As Advised	
Textbook	Tyler, N. et al, 2018, *Historic Preservation,: An Introduction to Its History, Principles, and Practice* (Third edition), W.W. Norton and company	
Lab./Computer work/Project	--	

POOL no. 2:

ARCE21	Building Energy Simulation Tools (From Group 1)	2 CH (1,1,1)
Course Contents	This course places a unique emphasis on the Building Energy Simulation tools and their effect on the building performance. The students will learn the practical skills required to design a high-performance building and confidently consult on all aspects of its technical specifications. Students are introduced to the concept of sustainable building design and explore how the environment, orientation, form, and equipment of a building affect its performance through the use of different building energy simulation software. This learning will be reinforced by a small-scale applied design project.	
Prerequisite (s)	As Advised	
Textbook	**Reading Resources:** Manuals of Energy Simulation tools: Design Builder, Energy Pro, Ecotect, eQUEST, Vasari	
Lab./Computer work/Project	--	

ARCE22	Biophilic Design (From Group 2)	2 CH (1,2,0)
Course Contents	This course explores the scientific foundations of biophilic design theory. Using case studies of best practice in Architecture, Planning and Urban design, this course covers the main tenets of Biophilia, as well as the different patterns of Biophilic Design as a tool. This course is intended to help Architecture and planning students understand the impact of biophilic design on human health and productivity, as well as to demonstrate how these elements can be incorporated into the built environments.	
Prerequisite (s)	As Advised	
Textbook	• Kellert, S, 2018, *Nature by Design: The Practice of Biophilic Design*, Yale University Press • Terrapin Bright Green, 2014: *14 Patterns of Biophilic Design, Improving Health & Well being in the Built Environment.* Terrapin Green.	
Lab./Computer work/Project	--	

ARCE23	Model Making / Digital Fabrication (From Group 3)	2 CH (1,1,1)
Course Contents	This course is a hands-on exploration and apprenticeship in the art and process of model making and digital fabrication. The course will assist students in nurturing the ability to efficiently translate ideas and concepts into manually/digitally produced physical objects. Students will also be given the opportunity to develop the skills necessary to maintain, calibrate and troubleshoot equipment in a fabrication lab as well as learn what it takes to keep a lab in operation.	
Prerequisite (s)	As Advised	
Textbook	Reading Resources: Handouts from Course Professor	
Lab./Computer work/Project	--	

ARCE24	Geographical Information Systems (GIS) (From Group 4)	2 CH (1,1,1)
Course Contents	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.	
Prerequisite (s)	As Advised	
Textbook	Paul Bolstad: *GIS Fundamentals: A First Text on Geographical Information Systems*, Fifth Edition, 2016	
Lab./Computer work/Project	--	

ARCE25	Environmental Rating Systems (From Group 5)	2 CH (1,2,0)
Course Contents	In this course concepts of sustainability in design and development are examined, also, different Environmental Rating systems are studied and examined through a comparative analysis. Different Environmental rating systems may include: • BREEAM (Building Research Establishment's Environmental Assessment Method) iv • CASBEE (Comprehensive Assessment System for Building Environmental Efficiency) • GBTool • Green Globes™ U.S. • LEED® (Leadership in Energy and Environmental Design) • DGNB, German Environmental Rating System and GPRS; the Green Pyramids Rating System of Egypt. Case studies analysis.	
Prerequisite (s)	As Advised	
Textbook	Lecture Notes and Instructor's Handouts	
Lab./Computer work/Project	--	

POOL no. 3:

ARCE31	Parametric Design Applications (From Group 1)	2 CH (1,1,1)
Course Contents	This course explores the techniques and tools used in parametric modeling and computational design as a foundation for design optimization. The class introduces several parametric design modeling platforms and scripting environments that enable rapid generation of 3D models and enable rapid evaluation of parametrically driven design alternatives. The course will tackle the Design exploration using parametric modeling platforms such as Revit and Rhino. The students will get introduced to Visual scripting languages and environments such as Grasshopper, Dynamo, and Design Script.	
Prerequisite (s)	As Advised	
Textbook	Jabi, W., Johnson, B., 2013, Parametric Design for Architecture, Laurence King Publishing	
Lab./Computer work/Project	--	

ARCE32	Interior Design (From Group 2)	2 CH (1,2,0)
Course Contents	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 issues in the course	
Prerequisite (s)	As Advised	
Textbook	**Recommended Readings:** -Massey, Anne. (1994).- *Interior Design of the 20th Century*, Thames and Hudson. London. -Mitton, Maureen (2004) - *Interior Design Visual Presentation*- John Wiley & Sons, 2nd ed. USA	
Lab./Computer work/Project	--	

ARCE33	Entrepreneurial Skills (From Group 3)	2 CH (1,2,0)
Course Contents	This course provides students with the skills necessary to succeed as an entrepreneur. The fundamentals of starting and operating a business, developing a business plan, obtaining financing, marketing a product or service and developing an effective accounting system will be covered.	
Prerequisite (s)	As Advised	
Textbook	A.J. Parr 2019: *The Ten Golden Rules of Entrepreneurial Success and Financial Wealth: BusinessStartup Lessons from Steve Jobs, Bill Gates, Jeff Bezos, Elon Musk, Arianna Huffington, Richard Banson and Tony Robbins*: Entrepreneur Mindset Series.	
Lab./Computer work/Project	--	

ARCE34	Advanced Landscape Architecture (From Group 4)	2 CH (1,2,,0)
Course Contents	The students in this course train to use different graphic communication technologies and create visuals for clients and site development. Students complete projects using the technologies of image manipulation software discussed in class. The students also learn about construction of the landscape designs in terms of materials and machinery, structure and building theory, paving methods and legal contracts preparation. They shall also explore concepts in electric and lighting systems, irrigation, scheduling and cost estimates.	
Prerequisite (s)	As Advised	
Textbook	Strom, S. et al, 2013: *Site Engineering for Landscape Architects, Wiley*.	
Lab./Computer work/Project	--	

ARCE35	Appropriate Architecture & Technologies (From Group 5)	2 CH (1,2,0)
Course Contents	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.	
Prerequisite (s)	As Advised	
Textbook	**Recommended Readings:** • Hassan Fathy: 1973 Architecture for the poor, AUC Press • Willaim Facey: 1997 Back To Earth, Al.Turath in Association with the Center of Arab Studios • Kenneth Framption: 1996 Charles Correa T&H (Thames & Hudson) • John V.Mutlow: 1997 The Architecture of RiCARDo Legorreta T&H • 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
Lab./Computer work/Project	--

POOL no. 4:

ARCE41	**Mixed Reality Applications (From Group 1)**	**2 CH (1,1,1)**
Course Contents	This course places an emphasis on the design principles of virtual reality (VR) and augmented reality (AR). In this course the students will be introduced to the skills required to create VR/AR simulations, visualizations and apps related to architecture and Urban Design. The students will be introduced to the creation of digital content and the practical application of VR/AR technologies and how this may affect their design decision making. They will learn how to develop their own architectural concepts using this technology – creating 2D and 3D digital artwork.	
Prerequisite (s)	As Advised	
Textbook	Wang, X., and Schnabel M., 2009 , *Mixed Reality In Architecture, Design, And Construction* 2009th Edition, Springer.	
Lab./Computer work/Project	--	

ARCE42	**Special Topics in Design (From Group 2)**	**2 CH (1,2,0)**
Course Contents	The course may address issues like: Hybrid Space Design/ Television and Theater Set Design/ Interior Design for the Elderly and the Disabled/ Space Syntax Theory and Applications, and other similar “Design” issues..	
Prerequisite (s)	As Advised	
Textbook	Handouts and Lecture notes provided by Instructor and related to the chosen subjects.	
Lab./Computer work/Project	--	

ARCE43	**Portfolio Making & Negotiation Skills (From Group 3)**	**2 CH (1,2,0)**
Course Contents	The course prepares students to professionally face their future careers with confidence and style. The portfolio preparation course develops visual, practical and technical skills to give students the framework to build a varied portfolio that showcases their strengths, creativity and interests. The course also enriches students’ negotiation skills through different methods, Preparing for Negotiations, Building Relationships, Eliciting Information Effectively, Holding Your Ground, Maintaining Flexibility, Closing the Deal, Increasing Confidence.	
Prerequisite (s)	As Advised	

Textbook	• Linton, H. and Pelli, C., 2012, *Portfolio Design (Fourth Edition)*, W. W. Norton & Company • Instructor's Lecture Notes and Handouts
Lab./Computer work/Project	--

ARCE44	Human Settlements, Upgrading & Management (From Group 4)	2 CH (1,2,0)
Course Contents	This course identifies the different types of human settlements, their dynamics and the challenges that might face them and cause for the 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. The course explains how the city management is done in Egypt and what could be done to enhance it.	
Prerequisite (s)	As Advised	
Textbook	Bowen,W and Gleeson, R, 2018: *The Evolution of Human Settlements: From Pleistocene Origins to Anthropocene Prospects*, Palgrave Macmillan	
Lab./Computer work/Project	--	

ARCE45	Innovative Architecture & Technologies (From Group 5)	2 CH (1,2,0)
Course Contents	Energy efficiency in buildings, New & renewable energy, Air / water / solar energy in architecture, Sustainable Architecture, Green Architecture. New materials and technologies. Case studies.	
Prerequisite (s)	As Advised	
Textbook	**Recommended Readings:** • Carbon-neutral Architectural Design by Pablo La Poche, 2012. • Green Building- Guidebook for Sustainable Architecture, by Michael Bauer, Peter Masle, and Michael Schwarz, 2010. • Kinetic Architecture – Designs for Active Envelopes, by Russell Fortmeyer and Charles Linn, 2014.	
Lab./Computer work/Project	--	

Other Elective Courses may be suggested and offered for registration based on:

- A request from the Department's Council to the Dean
- The recommendation of the Faculty Council
- The approval of the University Council