Architecture Engineering
Compulsory Architecture (108 Cr Hrs)

Code	Course Title	Cr.Hrs	Lec	Ex	Lab
ARE	114 History of Architecture	2	2	--	--
ARE	124 Theory of Structure (A)	2	1	2	--
ARE	125 Theories of Arch.(A)	2	1	2	--
ARE	144 Theory of Structure (B)	2	1	2	--
ARE	111 Fundamental of Architectural design	3	--	6	--
ARE	115 Perspective and Skiagraphy	2	--	4	--
ARE	113 Freehand and architectural presentation	2	1	2	--
ARE	112 Building Construction & Materials (A)	2	--	4	--
ARE	121 Elements of Architectural Design	3	--	6	--
ARE	122 Building Construction & Materials (B)	2	--	4	--
ARE	123 Visual Training	2	1	2	--
ARE	141Architectural Design of Simple Units	3	--	6	--
ARE	142 Diploma project	2	--	4	--
ARE	143 Computer Applications In Architecture (1)	2	--	--	6
ARE	151 Architectural Design of Complex Units	3	--	6	--
ARE	152 Execution Design (1)	3	1	4	--
ARE	153 Climate and Architecture of the desert	2	1	2	--
ARE	212 Materials and its Properties	2	1	--	3
ARE	213 Comp. App. In Arch. (2)	2	--	--	6
ARE	214 History and Theory of Planning	2	1	--	3
ARE	215 Theories of Architecture (B)	2	1	2	--
ARE	222 Reinforced Concrete and Foundations	2	1	--	3
ARE	223 Urban Design	3	--	6	--
ARE	242 Steel Construction	2	1	--	3
ARE	252 Surveying	2	1	--	3
ARE	255 Execution Documents & Specifications	2	1	--	3
ARE	211 Architecture Design (A)	3	--	6	--
ARE	221 Architecture Design (B)	3	--	6	--
ARE	224 Town Planning (A)	2	1	--	3
ARE	225 Legislation and management of construction projects	2	1	2	--
ARE	226 Tech. Installation for Buildings (A)	2	2	--	--
ARE	238 Green Architecture	3	2	2	--
ARE	244 Environmental Control	2	1	2	--
ARE	245 Execution Design (2)	3	1	4	--
ARE	246 Air Conditioning in Building	2	--	4	--
ARE	254 Town Planning (B)	2	1	--	3
ARE	256 Acoustics & Illumination	2	--	4	--
ARE	241 Architectural Design of Complex Buildings	3	--	6	--
ARE	243 Comp. App. In Arch. (3)	2	--	--	6
ARE	251 Environmental Design	3	--	6	--

ARE	253 Graduation Project Report	4	--	8	--
FTR	131 Field Tanning (1)	3	--	--	18
FTR	161 Field Tanning (2)	3	--	--	18
FTR	231 Field Tanning (3)	3	--	--	18
FTR	261 Field Tanning (4)	3	--	--	18

Architecture Engineering
Elective Architecture (A1&A2) Select 4 Cr Hrs)

Code	Course Title	Cr.Hrs	Lec	Ex	Lab
ARE	216 Housing	2	1	2	--
ARE	217 Passive Heating & Cooling	2	1	2	--
ARE	218 Solar Energy Utilization	2	1	2	--
ARE	219 Landscape	2	1	2	--
ARE	237 Computer Aided Design in Architecture	2	--	--	4
ARE	239 Urban Renewal and Upgrading	2	--	4	--

ARE 114 History of Architecture

2 Cr.hrs. = [2Lect. + 0Tut + 0 Lab]

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

References:

- Fletcher, Banister, a History of Architecture on the Comparative Method, 20th. Ed., 1996

ARE 124 Theory of Structure (A)

2 Cr.hrs. = [1Lect. + 2Tut + 0 Lab]

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

References:

- Bee F. P., Johnston E. R. Dewolf J. T. and Mazurek D. F, Mechanics of Materials, McGraw Hill Ltd, 2009.

ARE 125 Theories of Architecture (A) Prerequisite: ARE 114

2 Cr.hrs. = [1Lect. + 2Tut + 0 Lab]

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

References:

- Whilford , Frank , The World of Art , Hundson , 1984

ARE 144 Theory of Structure (B) Prerequisite: ARE 124

2 Cr.hrs. = [1Lect. + 2Tut + 0 Lab]

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

References:

- Bee F. P., Johnston E. R. Dewolf J. T. and Mazurek D. F, Mechanics of Materials, McGraw Hill Ltd, 2009.

ARE 111 Fundamental of Architecture Design

3 Cr.hrs. = [0Lect. + 6Tut + 0 Lab]

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

References:

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.
- Francis D. K. Ching, Architecture form space and order. 1/1996 ISBN-13: **978-0471286165**.
- John Wiley & Sons, Inc., New York, NY. ARCHITECTURAL GRAPHIC STANDARDS VERSION 3.0

ARE 115 Perspective and Skiagraphy

2 Cr.hrs. = [0Lect. + 4Tut + 0 Labs]

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

References:

- Mc Goodwin, Henry, Architectural Shades and Shadows, American Institute of Architects press, 1991.
- Shafie, Zajia, Architectural perspective, Cairo University press, 1977.

ARE 112 Building Construction & Materials (A)

2 Cr.hrs. = [0Lect. + 4Tut + 0 Labs]

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

References:

- Ching, F.D.K., Building Construction Illustrated, CBS Publishers & Distributors, India, 2008.
- Crosbie, Michael J. Time Saver Standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004

ARE 121 Elements of Architectural Design Prerequisite: ARE 111

3 Cr.hrs. = [0Lect. + 6Tut + 0 Lab]

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

References:

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.

ARE 122 Building Construction & Materials (B) Prerequisite: ARE 112

2 Cr.hrs. = [0Lect. + 4Tut + 0 Lab]

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

References:

- Madan Mehta, Walter Scarborough, Diane Armpriest, Building Construction: Principles, Materials, and Systems, Prentice Hall, 2009.
- Allen, E., Fundamentals of Building Construction: Materials and Methods, USA, 3rd. Ed., 1999.

ARE 113 Freehand and architectural presentation.

2 Cr.hrs. = [1Lect. + 2Tut + 0 Lab]

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

References:

- Linton, Harold, Color Model Environments: Color and Light in Three-Dimensional Design, Harold Linton, 1985.
- White, Edward T., A Vocabulary of Architectural Forms, Architectural Media, 1975.

ARE 123 Visual Training Prerequisite: ARE 113

2 Cr.hrs. = [1Lect. + 2Tut + 0 Lab]

The Study of Basic design principals, design elements, composition principles, shape, Materials, proportions and, colors, chromatic & achromatic sensations, color theory & color circle, plates & worlds, color intensity, & color harmony. Applications on theory of colors. Interiors of buildings, painting objects. The course is studied through applying design principles on 2 dimensional drawings and three-dimensional models.

References:

- Linton, Harold, Color Model Environments: Color and Light in Three-Dimensional Design, Harold Linton, 1985.
- White, Edward T., A Vocabulary of Architectural Forms, Architectural Media, 1975.

ARE 141 Architectural Designs of Simple Units Prerequisite: ARE 121, ARE 123

3 Cr.hrs. = [0Lect. + 6Tut + 0 Lab]

Introduction to architecture design of simple designs the course aims to deal with the criteria of context, including; Relationship between indoor & outdoor spaces, environmental conditions of the site , physical and visual analysis in addition to , Study of pedestrian and vehicular circulation. Projects would include Primary school, motel, exhibition hall, office building, residential building, small museum, bank branch, local post office, and community library. Study of site context and analysis of site planning elements. Study of structural coordination and constructional technology. The student should practice, Program analysis, functional studies, & design of simple building elements, site planning analysis. Introduction to constructional expression in architecture. To provide an

References:

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.

ARE 142 Diploma project Prerequisite: ARE 122

2 Cr.hrs. = [0Lect. + 4Tut + 0 Labs]

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

References:

- Davies, C., High technology architecture, Verlag Gerd Hatje, Stuttgart, 1988.
- Beakley, G. C., Autore, D.D., Patterson, T.L., Architectural Drawing and Design, Macmillan Publishing Company, NY, 1984.

ARE 151 Architectural Designs of Complex Units Prerequisite: ARE 141, ARE 112

3 Cr.hrs. = [0Lect. + 6Tut + 0 Lab]

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

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

References:

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.
- Zelnic, Architectural Graphic Standards for Housing & Residential Development, Mc Graw Hill, USA, 1994.

ARE 152 Execution Design (1)

3 Cr.hrs. = [1Lect. + 4Tut + 0 Lab]

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

References:

- Ching, F.D.K., Building Construction Illustrated, CBS Publishers & Distributors, India, 2008.
- Watson, D., Construction Materials and processes, Mc. Graw – hill Inc., 1986.

ARE 153 Climate and Architecture of the desert

2 Cr.hrs. = [1Lect. + 2Tut + 0 Lab]

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

References:

- Brow, G.Z., Sun, Wind and Light, Architectural Design Strategies, John Wiley & sons Inc, 2000.
- Lechner, N., Heating, Cooling and Lighting; Design Methods for Architects, John Wiley & sons, USA, 1991.

ARE 143 Computer Applications In Architecture (1) Prerequisite: CSC 001

2 Cr.hrs. = [0Lect. + 0Tut +6 Lab]

A general introduction to computer graphics & its application in architectural design & the graphic arts. Practical assignments are included this course introduces the student to AUTOCAD which is the most powerful 2D design and drafting platform.

Laboratory:

- Application on a program in the lab.

ITR 131 Field Training (1)

3 Cr.hrs. = [0Lect. + 0Tut +18 Lab]

The training semester consists of 7 weeks with a total of 18 hours\week. This first training is taken at training centers to be exposed to all different workshops under the supervision of professional trainers. Periodical progress reports have to be submitted, every two weeks, by the student to his training supervisor, along with a final report. Follow up visits by the training supervisors from the department should be scheduled, and their communication with the center's supervisors is essential part of the evaluation process.

ITR 161 Field Training (2) Prerequisite: FITR 131+80 units Completed

3 Cr.hrs. = [0Lect. + 0Tut +18Lab]

This second training semester should be taken at a construction site approved by the department. Students are trained on construction stages, starting from site preparation, excavation, foundation works, concrete mix (material proportion & properties), water proofing, and retaining walls. Concrete skeleton, building envelop, walls and partitions will also be included. The training semester consists of 7 weeks with a total of 18 hours\week. Periodical progress reports have to be submitted, every two weeks, by the student to his training supervisor at the department, along with a final report. Follow up site visits by training supervisors from the department should be scheduled, and their communication with site supervisors is essential part of the evaluation process. Site supervisors will keep attendance log, and student's progress evaluation.

ARE 212 Materials and its Properties

2 Cr.hrs. = [1Lect. + 0Tut + 3 Lab]

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

ARE 214 History and Theories of Planning Prerequisite: ARE 114

2 Cr.hrs. = [1Lect. + 0Tut + 3 Lab]

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

References:

- Leonardo Benevolo, The English edition of Die Geschichte der Stadlt: The History of the city, 1980.

ARE 215 theories of Architecture (B) Prerequisite: ARE 125

2 Cr.hrs. = [1Lect. + 2Tut + 0 Lab]

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

.**References**:

- Steele, James, Architecture Today, Phaidon Press Limited, London, 2001.
- Jencks, Charles, Modern Movement in Architecture, Academy Ed. Pub., London, 1999

ARE 222 Reinforced Concrete and Foundations Prerequisite: ARE 212

2 Cr.hrs. = [1Lect. + 0Tut + 3 Lab]

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

References:

Wang, Samon and Pincheira< Reinforced Concrete Design< John Wile & Sons, 7th Ed., 2007.

ARE 223 Urban Design

3 Cr.hrs. = [0Lect. + 6Tut + 0 Lab]

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

References:**.**

- Moughtin, Ciiff, Oc, Taner, Tiesdell, Steven, Urban Design: Ornament and Decoration, Oxford, Butterworth Architecture, 1995.
- Moughtin, Ciiff,, Urban Design: Street and Square, Oxford, Architectural Press, 3rd. Ed., 2003.

ARE 244 Environmental Control Prerequisite ARE: 153

2 Cr.hrs. = [1Lect. + 2Tut + 0 Lab]

This course emphasize on the important role of solar radiation, natural ventilation as of major climate elements affecting architecture &urban design. Which includes; sun and the Geographical relations between sun & earth in addition to, methods of defining sun angles at different points on earth during different days & hours of the year. Architectural control of sun rays on buildings. Air: Study of movements of wind: & architectural control of air movements in & between buildings.

References:

- Brow, G.Z., Sun, Wind and Light, Architectural Design Strategies, John Wiley & sons Inc, 2000.
- Lechner, N., Heating, Cooling and Lighting; Design Methods for Architects, John Wiley & sons, USA, 1991.
- Koenigsberger, O.H., Igersoll, T.G. Mayhew. A., Szokolay, S.V., Manual of Tropical Housing and Building, Longman, 1974.

ARE 242 Steel Construction Prerequisite: 212

2Cr.hrs. = [1Lect. + 0Tut + 3 Lab]

This course introduces the students the basic aspects of Steel Structures, The different structural elements required for constructing steel structure building, calculating the loads and the Design of different Steel structural elements.

Including ;Properties of steel, specifications, loads, allowable stresses, members subject to centric and eccentric tension compression, roof trusses, riveted connections, bracing, columns and their bases, beams, frames consisting of columns and trusses, frames extending over several halls, brackets, cranes, joints and connections.

Textbook:.

- Gorenc B., Tinyou R. and Syam A., Steel Designers Handbook, UNSW Press, 7th Ed., 2005.

References:.

- Housing and Building National Research Center, Egyptian Code for Design and Construction of Reinforced Concrete Structures, 203, 2007.

ARE 252 Surveying

2Cr.hrs. = [1Lect. + 0Tut + 3Lab]

Plane & geodesic surveying, triangulation points kinds of maps, longitudinal & diagonal scales & enlarging maps. Pantograph & Areas. To provide an introduction to engineering surveying includes units and scale, mapping, linear measurements, closed traverse computations and adjustment, leveling, contouring maps, calculation of area, types of bearings, and the use of theodolite in measuring horizontal and vertical angles.

Textbook:.

- Wilfred Schofield an Mark Breach, Engineering, Elsevier, 6th Ed., 2007.

ARE 255 Execution Documents & Specifications Prerequisite: ARE 244

2Cr.hrs. = [1Lect. + 0Tut + 3 Lab]

The project aims to the preparation of a complete set of execution documents of a given project; containing large span elements designed by the student, to provide an introduction to the adjudication's procedures the specification's writing rules of the building work and items and the rules of surveying quantities of the building work and items.

ARE 211 Architecture Design (A) Prerequisite: ARE 151

3 Cr.hrs. = [0Lect. +6Tut + 0 Lab]

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

References:

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.
- Fair-weather, Leslie & Silwa, Jan A. AJ Metric Handbook, The Architectural press Ltd., London, 2008.

ARE 221 Architecture Design (B) Prerequisite: ARE 211

3 Cr.hrs. = [0Lect. +6Tut + 0 Lab]

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

References:**.**

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.

ARE 224 Town Planning (A) Prerequisite: ARE 214

2 Cr.hrs. = [1Lect. +0Tut + 3 Lab]

The course introduces the students to the general definition of physical planning at different levels. Comprehensive studies (goals, objectives, stages & tools). Studies cover planning criteria, programming & stages of implementation, principles of land uses, neighborhood theory, slum clearance & Upgrading of slum area. Study of housing problems, housing prototypes & solutions. Factors & planning methodology influencing housing areas. Combined project on housing & planning.

References:

- Leonardo Benevolo, The English edition of Die Geschichte der Stadlt: The History of the city, 1980.
- Moughtin, Ciiff, Oc, Taner, Tiesdell, Steven, Urban Design: Ornament and Decoration, Oxford, Butterworth Architecture, 1995.
- Moughtin, Ciiff,, Urban Design: Street and Square, Oxford, Architectural Press, 3rd. Ed., 2003

ARE 225 Legislation and management of construction projects

2 Cr.hrs. = [1Lect. +2Tut + 0 Lab]

This course is designed to familiarize student with the law and regulations governing the construction of comprehensive regulation, whether in existing zones or new, with a focus on the importance of requirements of building in the preparation of urban design levels and a commitment to achieve sustainable development, it will also review scheduled bodies and relevant agencies to prepare planned and implemented.

References:

- Oberlender, G.D., "PROJECT MANAGERMENT FOR ENGINEERING AND CONSTRUCTION", McGraw-Hill, 2000.
- Peurifoy, R. L., "CONSTRUCTION PLANNING, EQUIPMENT AND METHODS", McGraw-Hill, 2001.
- Peurifoy, R. L. & Oberlender, G.D. "ESTMATING CONSTRUCTION COSTS", McGraw-Hill, 2001.

ARE 226 Tech. Installations for Buildings

2Cr.hrs. = [2Lect. +0Tut + 0 Lab]

Sanitary engineering; Plumbing and building equipment sanitation, public health education, and sewage disposal system. Water supply; public intakes, sedimentation and clarifies, filtration, chlorinating, disinfecting, storing and distribution. Plumbing system, plumbing fixtures, and distribution system. The main and branches, connections, and piping materials. Building mechanical equipments: lifts, escalators, kitchens and laundries.

References:**.**

- A. C. Panchdhari, Water Supply And Sanitary Installations, New Age International, 2005.

ARE 245 Execution Design (2) Prerequisite: ARE 152 ARE 226

3Cr.hrs. = [1Lect. +4Tut + 0 Lab]

The course deals with preparing execution design drawings for more sophisticated projects taking into consideration the different technical systems and installations. Advanced structural systems, as well as, electromechanical ducts and spatial requirements are introduced through the study of the course. Application on student's own design project, from previous semester, enriches the study in order to teach the student how to develop design concepts to real projects. The course takes care of the coordination process between the different technical systems, included in the project, on one hand, and the different execution documents and drawings, on the other. The course aims to apply BIM systems and programs in presentation of the project using computer aided programs. (Revite)

References:

- BIM programs

ARE 246 Air Conditioning in Building Prerequisite: ARE 226

2Cr.hrs. = [0Lect. +4Tut + 0 Lab]

Air conditioning: Psychometric charts, physical and physiological principles, fundamentals of heat transfer, duct design, heating and cooling cycles.

(text books) :

- **Air Conditioning E.P. Anderson**
- **Air Conditioning and Engineering W.P. Jones**
- **Air Conditioning Impact on The Buildings A.F. Sherratt**
- **Air Conditioning Principles and Systems E.G. Pita .**

ARE 254 Town Planning (B) Prerequisite: ARE 224

2Cr.hrs. = [0Lect. +4Tut + 0 Lab]

The course aims to apply urban planning project through the Principles of GIS: maps, scale, GIS origins, the development of GIS, map decomposition, map algebra, Current GIS market estimates, future market projections and trends; GIS Data: Point, Line, and polygon data. Raster, Vector and voxel data; Database structures: Data types: Continuous, ordinal and discrete data. Integrating different data structures and data types; General Overview of GIS Capabilities and Functions. Data collection, management, manipulation, analysis, display and visualization; Components of GIS system: Software, operating system, hardware, peripherals, data, people, management, infrastructure; Data Types and Data Sources: Raster, Vector, point data sources.

Textbook:

- Gelso, D., GIS for Building and Managing Infrastructure, ESRI Press, 2009.

References:

- Aronoff, S., Remote Sensing for GIS Mangers, ESRI press, 2005.

ARE242 Acoustics & Illumination Prerequisite: ARE 226

2Cr.hrs. = [1Lect. +0Tut + 3 Lab]

Acoustics: Definition of architectural acoustics and its importance in buildings, concepts and terminologies, behavior of sound waves in enclosures, sound absorption, sound reflections, sound isolation, the acoustical defects, the concepts and objectives of the successful acoustics design. Artificial illumination: physics of light, terminology and definitions. Luminance measurements, light sources, designing for artificial lighting quantity,integration with day lighting.

***References**:*

- .Egan, M. David, Architectural Acoustics, McGraw Hill book company, 1988.
- Stein, Reynolds- McGuiness, Mechanical and electrical Equipments for buildings, John Wiley and sons, 7th Ed., 1986.

ARE 213 Computer Applications In Architecture (2) Prerequisite: ARE 143

2 Cr.hrs. = [0Lect. + 0Tut +6 Lab]

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

Laboratory:

- Working With Computer Architecture Packages.

ARE 241 Architectural Design of Complex Buildings Prerequisite: ARE 221

3 Cr.hrs. = [0Le. +6Tut + 0 Lab]

Data gathering & analysis of different programs for buildings of complex nature or groups of buildings. Development of the architectural design of these buildings taking into consideration spacing and visual aspects. This course is cAREied out with special emphasis on modeling. Provide sufficient knowledge on dealing with different programs for buildings of complex nature or group of buildings. Comprehensive design projects addressing all design issues and higher levels of detail. Consideration will be given to the knowledge pertaining to other design disciplines such as: urban design, landscape design, and construction detailing. The course will enhance skills on critical and analytical thinking as well as creative problem solving. A list of many advanced projects will be shown to select the term project from: Cultural centers, airports, olympic village, sport stadiums, residential complex, hospitals and health compounds, university campus, and cyber center or intelligent village.

References:.

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.

ARE 243 Computer Applications In Architecture (3) Prerequisite: ARE 213

2 Cr.hrs. = [0Lect. + 0Tut +6Lab]

The use of software in the development of architectural designs, formation, architectural rendering and 3D models.

Laboratory:

- Working With Computer Architecture Packages.

ARE 251 Environmental Design Prerequisite: ARE 241, 244

3 Cr.hrs. = [0Lect +6Tut + 0 Lab]

The course aims to address Studies of architectural project related to realistic problems with integration of structure, mechanical systems, environmental aspects, sustainability and green architecture and application of construction laws. Students learn how to analyze and then synthesize the various issues of space and form with special emphasis on environmental requirements and landscaping. Studio work includes lectures, perspectives and workshop models. Using computer application program related to environmental simulation programs is essential for this course. (ecolect)

References:

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Crosbie, Michael J., Time Saver standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.
- Simulation programs.

ARE 238 Green Architecture

3 Cr.hrs. = [2Lect. + 2Tut + 0 Lab]

The course aims to learn about: Ecosystems - The concept of green architecture - Theories of green architecture - Green architecture and climate - Design projects for green architecture.

References:

- Brow, G.Z., Sun, Wind and Light, Architectural Design Strategies, John Wiley & sons Inc, 2000.

ARE 253 Graduation Project Prerequisite: ARE 241

4Cr.hrs. = [0Lect. + 8Tut +0 Lab]

The students should achieve the following assignments on two consecutive semesters: This course will be reserved for project selection and research; that includes an independent investigation on the topic of the project, (data gathering, analysis, programming, site information etc.). A comprehensive report containing all collected data should be presented for evaluation at the end of the semester.

FTR 231 Field Training (3) Prerequisite: FTR 162+115 units Completed

3 Cr.hrs. = [0Lect. + 0Tut +18 Lab]

Training in this semester will be also at a construction site, and will include all the internal technical installations and finishes. The training semester consists of 7 weeks with a total of 18 hours\week. Periodical progress reports have to be submitted, every two weeks, by the student to his training supervisor at the department, along with a final report. Follow up site visits by the training supervisors should be scheduled to monitor training progress. Site supervisor's evaluation is essential part of the assessment process.

FTR 262 Field Training (4) Prerequisite: FTR 231+150 units Completed

3 Cr.hrs. = [0Lect. + 0Tut +18 Lab]

The course will be reserved for the architectural design of graduation project: Application of all accumulated knowledge from previous courses should be demonstrated. The students are allowed to choose their own projects, subject to the approval of the final project committee.