

Undergraduate Catalogue 2014

Faculty of

ARCHITECTURAL ENGINEERING

Faculty Administration

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History

The Faculty of Architectural Engineering was founded in 1962 as the fourth faculty at BAU. Since commencement, it has played a key role in addressing and serving the needs of students from Lebanon and the entire Middle East. The faculty started with 36 students in 1962 prospering to a total of 515 students in 2013, at various levels of the curriculum.

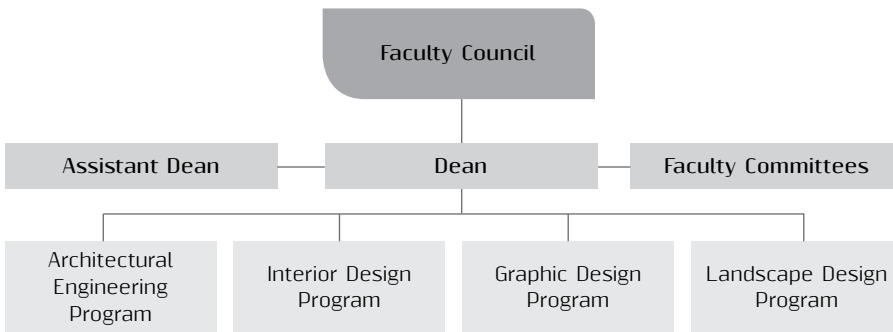
The faculty was initially located at the main building in Beirut campus. However, in 1987 and in order to accommodate the increasing number of students and facilities, it moved to the now labeled "Hariri Building" and occupied the top four floors. It remained there until October 2006 when it became the first BAU faculty to reside in the newly established Debbieh campus in the Shouf District in line with the University's expansion plans. Moreover, the Faculty has recently expanded to the Tripoli Campus that now hosts around 150 architecture students enrolled in the first, second, third and fourth levels.

The faculty constantly updates its programs and their structure. In 2005, the faculty implemented the Credit Hour System, instead of the two academic terms scheme, thereby offering students a more adaptable and responsive program spreading over a ten-semester period (minimum). In June 2012, the 5 year Bachelor program in Architectural Engineering has been awarded unconditional validation for RIBA Part1 for a period of five calendar years.

The Postgraduate Programs were launched in 1972, and the first Master Degree in Architecture and Urban Design was awarded in 1974.

The Postgraduate Programs were temporarily stopped due to the Civil War and restarted with the Diploma program in 1996. Registration for the PhD and Master programs commenced in 2000 and the first of both was awarded in 2005.

Organizational Structure



Vision

The vision of the Faculty of Architectural Engineering is to foster a challenging learning environment and to continually compete as well as lead advances in architectural education, in order to prepare innovative, critical and industrious graduates able to improve, through their future careers, the quality of the built environment.

Mission

Consistent with the University strategy, the Faculty of Architectural Engineering is committed to delivering a professional architectural education necessary for those seeking to enter the architectural practice. The Faculty's academic mission is to further develop the discipline and practice of architecture through a seamless program of undergraduate and postgraduate studies respecting individualism and diversity, and fostering for creativity and rationalism in design and construction process. The Faculty seeks to educate diligent architects who practice their career in a responsive manner towards the society, culture and environment at the local, regional and international level.

Academic Programs

The Faculty offers a Bachelor of Architectural Engineering Degree where the standard duration of study is 10 semesters, as well as Bachelor degrees in Arts and Design programs including interior design, graphic design and landscape design where the duration of study is six semesters.

1- ARCHITECTURAL ENGINEERING PROGRAM

Objectives

The Architectural Engineering program employs a progressive strategy to achieve the following broad objectives:

- To create and maintain a positive educational environment that promotes learning and personal development;
- To deliver high-quality architectural education, through a developed curriculum and syllabus with inherent flexibility and freedom of selecting different fields of specialization;
- To adopt progressive learning methods which lead to developed knowledge and acquired skills, ensured through adequate delivery and testing processes at each stage of study;
- To provide students with a comprehensive basis of awareness, knowledge, understanding, and aptitude, through covering a wide spectrum of theoretical and practical studies in such fields as Environment, Art, Culture, Technology, Sociology, and Economy;
- To implement an ongoing process of monitoring and development of performance, driven by the emphasis on future developments, within the domain of architecture as well as related disciplines.

Admission Requirements

To be accepted for an undergraduate degree, applicants must:

- Hold the official Lebanese Secondary School Certificate in a branch relevant to the chosen undergraduate field of specialization, or an official equivalent;
- Successfully pass an entrance exam to measure the level of proficiency **in English Language (or provide evidence of English Language abilities such as TOEFL, IELTS...), and an aptitude test (thinking skills, technical & architectural skills), as well as attend a Personal Interview.**

Learning Outcomes

The Faculty offers the Bachelor Degree in Architectural Engineering in a five-year cumulative program (10 semesters). After the fifth year, the undergraduate student is a qualified architect and eligible to practice professionally with the following abilities and skills:

- Full understanding of all architectural and engineering concepts and practices.
- Knowledge of the evolving nature of the profession, and the rapidly changing conditions in which architects currently practice, and in which the traditional expertise, capacities and authority are increasingly being challenged.
- Understanding of modern and contemporary architectural theories that explain the latest philosophies by well-known architects and the local architecture in order to preserve the local identity.
- Use of several skills, necessary to their professional practice like: career development, continuing education and life learning, multi-disciplinary and inter-disciplinary tasks (esp. administration and operation management); marketing: exploring contextual dynamics and micro-economics

complementary activities and ancillary duties, technological awareness, self-driven training and capabilities, engineering and development of new materials, computer software, construction methods, resource efficiency: Sharing and transfer of technologies, and heritage management: formulation of policies and practicable approaches.

Career Opportunities

Many graduates will take up a career in private practice or government. Many become specialists in heritage, sustainable design or commercial projects. However, because an architect’s skills and training are so broad, there are also many opportunities outside mainstream architectural practice. An architect may practice:

Architectural design; Development of execution drawings; Project management; Construction management; Site supervision; Interior design; Building renovation; Urban planning, Urban design and landscaping.

Graduation Requirements

To receive a Bachelor Degree in the Architecture Engineering Program, a student must satisfactorily complete the credit hours required and get an overall minimum grade point average (GPA) of 2.0 + ICDL

(International Computer Driving License).

The following table summarizes the number of credits required for graduation:

Program	*University Requirements + ICDL		Program Requirements		Total Credit Hours
	Mandator Courses	Elective Courses	Major Core Courses	Free and Major Electieve Courses	
ARCH	5 Cr.	7 Cr.	Design studios, essential theoretical and technical requirements, execution design and building technology courses, and courses in Architectural Engineering (136 Crs.)	- 200 Level courses: 4 Crs. - 300 Level courses: 6 Crs. - 400 Level courses: 6 Crs. - 500 Level courses: 6 Crs. (22 Crs.)	170
ARCH: Architecture					

Program Overview

The undergraduate curriculum for the degree of Bachelor in Architectural Engineering consists of 170 credit hours + ICDL. However, University Requirements have a total of 12 credits which leaves 158 credits for Architectural Engineering courses. Architectural Engineering courses thus form a total of 93% of the required courses for graduation.

The total credit hours of design studio and supporting courses are 118 out of 158, thus constituting 75% of the total Architectural Engineering credit hours. This total number of design studio credit

* A total of 12 credits is required as General University Requirements; 5 credits are selected from the University Mandatory Courses list including ARAB 001 (2Cr.), ENGL 001 (2Cr.), BLAW 001 (1Cr.) and another 7 credits are selected from the University Elective Courses list + ICDL.

hours is formed of Design Studio Courses as well as Design Supporting Courses.

Design Supporting Courses are calculated in different percentages according to their effective relevance to design studio courses in the following manner:

Theory and History Courses	12 Cr.- 100% Effective
Urban Design, City and Town Planning Courses	4 Cr.- 100% Effective
Execution Design and Building Technology Courses	31 Cr.≈60% Effective (18.6 Cr.)
Elective Courses/General Courses	40 Cr.≈40% Effective (16 Cr.)
Computer Courses	4 Cr. - 15% Effective (0.6 Cr.)
Civil Engineering Courses	8 Cr. - 15% Effective (1.8 Cr.)

Major Core Courses

Courses			crs.	Pro/Co-requisites
ARCH	*271	Architectural Design Fundamentals: Visual Studies	6	
ARCH	272	Architectural Design Fundamentals: Physical Studies	5	Pre: ARCH271
ARCH	*273	Building Construction I	2	
ARCH	274	Building Construction II	3	Pre: ARCH273
ARCH	275	History of Architecture I	2	
ARCH	276	Theory of Architecture I	2	
ARCH	277	CAD Drawing	2	
ARCH	278	Computer Graphics	2	Pre: ARCH277
ARCH	279	Architectural Sketching	2	
ARCH	280	Academic Writing	2	
ARCH	*291	Architectural Design I	5	Pre:ARCH272
ARCH	*292	Architectural Design II	5	Pre: ARCH291
ARCH	*293	Building Construction III	3	Pre: ARCH274
ARCH	*294	Building Construction IV	3	Pre: ARCH293
ARCH	295	History of Architecture II	2	
ARCH	296	Theory of Architecture II	2	Pre: ARCH276
ARCH	297	Theory of Colors	2	
ARCH	298	Indoor Environmental Control	2	
CVEE	231	Theory of Structures for Architects	2	

CVEE	232	Concrete and Steel Structures	2	
ARCH	*331	Architectural Design III	5	Pre: ARCH 292
ARCH	*332	Architectural Design IV	5	Pre: ARCH331
ARCH	*333	Execution Design I	3	Pre: ARCH294
ARCH	*334	Execution Design II	3	Pre: ARCH333
ARCH	335	History of Architecture III	2	
ARCH	336	Theory of Architecture III	2	
ARCH	337	Interior Design	2	
ARCH	338	City and Town Planning	2	
ARCH	339	Environmental Design	2	
MECH	431	HVAC and Sanitation for Architects	2	
ARCH	*431	Architectural Design V	5	Pre: ARCH332
ARCH	*432	Architectural Design VI	5	Pre: ARCH431
ARCH	*433	Execution Design III	3	Pre:ARCH334
ARCH	*434	Execution Design IV	3	Pre: ARCH433
ARCH	435	Urban Design	2	
ARCH	436	Research and Programming	2	
ARCH	437	Project Management	2	
ARCH	438	Specifications and Quantities	2	
CVEE	331	Soil Mechanics & Foundations, and Material Properties & Testing	2	
CVEE	332	Surveying for Architects	2	
ARCH	533	Architectural Criticism	2	
ARCH	534	Graduation Thesis	2	
ARCH	535	Building Regulations and Professional Practice	2	
ARCH	536	Design and Building Economics	2	
ARCH	537	Architectural Design VII	5	Pre: ARCH432
ARCH	539	Project Programming	3	Pre: ARCH432, ARCH436
ARCH	540	Senior Project	8	Pre: ARCH434, ARCH537, ARCH539.
ARCH	541	Architecture Internship	0	

* These core modules are separated and independently graded courses. Students failing the first module (Fall Sem.) is not allowed to register in the second one (Spring Sem.).

Description of Major Core Course

- ARCH271** ARCHITECTURAL DESIGN FUNDAMENTALS: VISUAL STUDIES (6Cr.: 2Lec, 8Stu):
Introductory course including fundamentals of architectural drafting techniques, two dimensional representation, and orthographic projections. Studies of artistic expression and inventive composition. Principles and rules of visual composition. Vocabulary of visual composition, relationships and aesthetics. Experimentation, diverse tools and materials used to visually interpret artwork and design concepts. Practical considerations and applications.
- ARCH272** ARCHITECTURAL DESIGN FUNDAMENTALS: PHYSICAL STUDIES (5Cr.: 0Lec, 10Stu):
Series of Exercises leading to the development of manual drawing and delineation skills. Study of human activity, dimensions of human figure and ergonomic as means of designing usable space. Representation of building elements in plans, elevations and sections. Projection techniques for shade shadow construction. 3 Dimensional drawings of building interior and exterior. Applications leading to the understanding of model types, materials and techniques of preparation. Managing different types of models and levels of detailing. Pre-req.: ARCH271.
- ARCH273** BUILDING CONSTRUCTION I (2Cr.: 1Lec, 2Stu):
The basic building construction materials including bricks, masonry, lime, cement, mortar and concrete. Study of structural systems and their major elements: structural frame, exterior and interior bearing walls, nonbearing walls and partitions, and floor and roof assemblies. General fundamentals site preparation, foundation types and selection.
- ARCH274** BUILDING CONSTRUCTION II (3Cr.: 1Lec, 4Stu):
Further developing knowledge about the fundamentals and preliminary principles of reinforced concrete and steel construction. Review of typical building elements and special treatments within buildings including: structural joints, damp proofing, thermal insulation and fire protection. Pre-req.: ARCH273
- ARCH275** HISTORY OF ARCHITECTURE I (2Cr.: 2Lec):
Core module of history of art and architecture in various civilizations, including Pre-historic, Ancient Egyptian, Mesopotamian (Assyrian and Babylonian), and Greek. Different approaches to the presentation of history: visual images, cultural material, and text-based communication.
- ARCH276** THEORY OF ARCHITECTURE I (2Cr.: 2Lec):
Introduction to basic design theories and strategies related to the development of spatial concepts in architectural design, including composition, color, form, relationship of elements, and development of 2-D and 3-D design projects. More emphasis on concept generation and evaluation.

- ARCH277** CAD DRAWING (2Cr.: 1Lec, 2Lab):
Basic computer aided drafting skills using the latest release of CAD software including: file management, Cartesian coordinate system, drawing set-ups, drawing aids, layer usage, drawing 2D geometric shapes, editing objects, array, text applications, dimensions and dimension variables, paper space and viewports, templates, external references, and printing/plotting. 3D AutoCAD features and commands including: wireframe construction, surface modeling, solid modeling, extrusions, Boolean operations, 3D editing, and 3D views.
- ARCH278** COMPUTER GRAPHICS (2Cr.: 1Lec, 2Lab):
PhotoShop application for architectural rendering and the creation, modification and manipulation of images. SketchUp modeling for the conceptual phases of design. 3D rendering and animation using AUTODESK 3D Studio software. Emphasis on 3D geometry, texture mapping, lighting, camera placement, shading, photo-realistic rendering, animation techniques, and walk through animations. Prerequisite: ARCH277.
- ARCH279** ARCHITECTURAL SKETCHING (2Cr.: 0Lec, 4Stu):
Developing graphic language by which an architect explains buildings and other objects using a range of fundamental drawing skills and media. Exercises in freehand representational drawing using charcoal, graphite, and conte crayon with emphasis on line, proportion, values, and composition. Portfolio of drawings based on observation of the physical world, in particular the built world. Studies progress from geometric to non-geometric forms.
- ARCH280** ACADEMIC WRITING (2Cr.: 2Lec):
Methods and tools needed to prepare academic and professional documents are reviewed. Basic knowledge about various steps, stages, and process of production of complete research papers and technical reports, the principles of writing, standards, requisites, considerations, phases, and subject-related requirements. The final assessment in this course is to be carried out internally (e.g. oral discussion and/or within exam).
- ARCH291** ARCHITECTURAL DESIGN I (5 Cr.: 0Lec, 10Stu):
Fundamentals of Architectural Design Process. Design projects requiring theoretically informed and practically viable architectural design solutions. Designs in response to specific aims including modular design, architectural space grouping, articulation of spaces and functional relationships. Pre-req.: ARCH272.

- ARCH292** ARCHITECTURAL DESIGN II (5Cr.: 0Lec, 10Stu):
Design projects leading to the development of Design Process starting from the site analysis. Detailed knowledge of different aspects of design presented and evaluated both graphically and orally. Portfolio of designs in response to specific aims comprising the study of outer and inner spaces relationship, building and site relationship, and landscaping. Contextual design reflecting environmental, social and cultural imperatives. Pre-req.: ARCH291.
- ARCH293** BUILDING CONSTRUCTION III (3Cr.: 1Lec, 4Stu):
Review of various systems of floor, wall, and roof including the study of structural properties, and construction techniques and materials. Indoor finishing materials and development of finishing schedule. Exercise based class simulating the understanding of construction including analysis and applications of standards, relationships, and material review and selection. Development of construction drawings and detailing. Pre-req.: ARCH274.
- ARCH294** BUILDING CONSTRUCTION IV (3Cr.: 1Lec, 4Stu):
Materials and techniques for internal and external finishes including internal partitions, openings, façade systems (curtain walls, double skin façade, etc.). Types and details of skylights. Landscape detailing and street furniture. Analysis and applications of standards, material review and selection. Development of construction drawings and detailing. Pre-req.: ARCH293.
- ARCH295** HISTORY OF ARCHITECTURE II (2Cr.: 2Lec):
Study and review of Roman architecture, Early Christian architecture, Byzantine architecture, Medieval architecture, Romanesque and Gothic architecture, and Renaissance architecture in Europe through 15th and 16th Centuries.
- ARCH296** THEORY OF ARCHITECTURE II (2Cr.: 2Lec):
This course explores the form, space and scale: form defining space, qualities of architectural space, articulation and organization of form and space, circulation elements and building approaches. It investigates the intentions in architecture: design process, architectural concept and unity. It also reviews the principles of aesthetics: vocabulary of architectural compositions, visual and aesthetic relationships. The course includes analysis of design principles and their applications in various architectural examples. Pre-req.: ARCH276.
- ARCH297** THEORY OF COLORS (2Cr.: 1Lec, 2Stu):
Color theories including a variety of concepts, as well as many practical uses of color within architecture. Color Aspects: psychology of visual perception, human response to visual imagery and communication using color. Designer's Methods to develop and best utilize color within environments. Informed application of practical color theory principles to student projects selecting colors wisely and deliberately.

- ARCH298** INDOOR ENVIRONMENTAL CONTROLS (2Cr.: 2Lec):
Principles of lighting (daylight and artificial) in buildings, Reducing noise and enhancing sound for communication. Regulating heat transfer for occupant thermal comfort. Description of passive means for environmental control, including presentation of scientific explanations and design guidelines for utilizing these means. Design guidelines for use in the preliminary schematic design phase.
- CVEE231** THEORY OF STRUCTURES FOR ARCHITECTS (2Cr.: 1Lec, 2Tut):
Theory and concepts of structures to emphasize an intuitive comprehension of the fundamental principles of structural behavior including loading, shear and bending moments. Calculation of internal forces in simple structures such as cantilevers, simple beams, and overhanging beams. Calculation of internal forces in truss members.
- CVEE232** CONCRETE AND STEEL STRUCTURES (2Cr.: 1Lec, 2Tut):
Combined Course addressing two technical fields:
Review of concrete and steel structure systems. Reinforced concrete fundamentals reviewing basics of reinforced concrete behavior and introducing methods of design used in current engineering practice. Basic mechanics of structural concrete introduced in examining bending, shear, and axial forces. Topic areas including beams, slabs systems, columns, foundations, retaining walls, and an introduction to pre-stressed concrete.
Based on a statics and strength of materials, Review of tension, compression and bending steel members designed into truss or column and beam structural systems.
- ARCH331** ARCHITECTURAL DESIGN III (5Cr.: 0Lec, 10Stu):
Design projects leading to the development of architectural concepts. Developmental processes of design are presented and critically evaluated, both graphically and orally. Constructivist design studio emphasizing on structural systems. Portfolio of designs in response to specific aims comprising formal structural and universal space concept. Pre-req.: ARCH292.
- CVEE331** SOIL MECHANICS & FOUNDATIONS, AND MATERIAL PROPERTIES & TESTING (2Cr.: 1Lec, 2Tut):
Combined Course addressing two technical fields: Introduction to soil mechanics: Soil formation and soil structure; Soil composition; Grain size analysis; Plasticity of soils; Effective stress concept; shear strength, stress distribution; Bearing capacity of shallow foundation; Theory of consolidation; Settlement; Soil exploration. Foundations: shallow, deep foundations, and pile caps.
Introduction to Testing and properties of materials: strength characteristics of building materials and material assemblies; stress and strain; rigidity and deformation; temperature effects; torsion effects; combined loading of elements and systems.

- ARCH 332 ARCHITECTURAL DESIGN IV (5Cr.: 0Lec, 10Stu):**
Design studio emphasizing on the urban context as a generator of architecture. Developmental processes of design are presented and critically evaluated, both graphically and orally. Portfolio of designs in response to specific aims comprising advanced study of urban context, development of master plan including design of public spaces and landscaping. Creation of architectural character and identity in the design of spaces and buildings' complex. Pre-req.: ARCH331.
- CVEE332 SURVEYING FOR ARCHITECTS (2Cr.: 1Lec, 2Lab):**
Technology Discussion of the major topics in surveying engineering technology including field instrumentation, boundary surveying, topographic surveying. Measurement of distances, directions and angles, using the tape, level, compass, transit and theodolite. Computation of areas and traverses, lines and grades. Also, an introduction to construction surveys, and an introduction to GPS measurement.
- ARCH 333 EXECUTION DESIGN I (3Cr.: 1Lec, 4Stu):**
Principles of preparing a complete portfolio of architectural tender drawings. Application on a building or project initially designed by the student in ARCH232. Principles of producing integrated portfolio of tender drawings. Analysis and applications of standards, material review and selection. Pre-req.: ARCH294.
- ARCH 334 EXECUTION DESIGN II (3Cr.: 1Lec, 4Stu):**
Preparations of an integrated portfolio of architectural working drawings related to the project assigned to the student in ARCH333. Execution drawings various architectural details (internal and external) interpreting building components relationships. Information relevant to the construction materials, color schemes, execution methods and processes. Pre-req.: ARCH333.
- ARCH 335 HISTORY OF ARCHITECTURE III (2Cr.: 2Lec):**
Overview of Islamic architecture. Roots and early beginnings. Trends and development of Islamic architecture: features and values. Umayyad and Abbasid architecture. Early and classic architecture in North Africa and the Middle East. Evolution of Islamic architecture: Fattimid, Ayyubid, Bahari Mamluk, Circassian Mamluk, and Ottoman architecture.
- ARCH 336 THEORY OF ARCHITECTURE III (2Cr.: 2Lec):**
The formative aspects of architecture from the early 20th century to present day. Emphasis on new trends and associated activities in the field of architecture. Detailed studies of various periods within broad spectrum. Issues of spatial organization, construction, architectural theory, and architectural grammar. Physical, social and economic context of building. Role of the architect in society.

ARCH 337 INTERIOR DESIGN (2Cr.: 1Lec, 2Stu):

Interior design theories covering diverse issues and topics as relevant to indoor environments, components of interior design, considerations, characteristics, and relationship with architectural design, methods and processes, contemporary trends and approaches to interior design, values, interpretation and formulation of concepts.

ARCH 338 CITY AND TOWN PLANNING (2Cr.: 1Lec, 2Stu):

Town Planning theories, practices and ideas. Definitions, objectives and levels of Planning. Origins and evolution of historical and contemporary ideas underlining planning practice in its various forms. Relevant topics: land use, housing, human settlements and urban environments. Current challenges and concerns of urban development or planning, aspects of the planning profession.

ARCH339 ENVIRONMENTAL DESIGN (2Cr.: 1Lec, 2Stu):

Fundamental theories about environmental sustainability, definitions, concerns and processes. Introduction to building assessment systems including LEED, Green Globes, Green Point Rated, etc. Green building Applications on green building design process and sustainable features such as: water conservation systems; recycling, re-use, waste management, green material selection; and indoor environmental control strategies.

MECH 431 HVAC AND SANITATION FOR ARCHITECTS (2Cr.: 2Lec):

Course addressing two technical fields: HVAC: Introduction to air conditioning and mechanical installations in buildings and indoor spaces. Various heating and cooling systems. Ventilation and air conditioning of various building types. Installations and control of systems. Sanitation: Sanitary engineering issues. Building site selection. Dampness: sources and methods of insulation. Water supply treatment and distribution. Sanitary fixtures, installation and connections. Treatment of soiled water. Rainwater drainage and storm sewers. Biological purification of sewerage. Solid waste and refuse disposal.

ARCH 431 ARCHITECTURAL DESIGN V (5Cr.: 0Lec, 10Stu):

Projects leading to the development of a Holistic Design Process. Detailed knowledge of a specialist aspect of design presented and critically evaluated, both graphically and orally. Portfolio of designs aiming to develop environmental conscious buildings, study and analyze environmental, social, and economic aspects of sustainability in architecture. Pre-req.: ARCH332.

ARCH 432 ARCHITECTURAL DESIGN VI (5Cr.: 0Lec, 10Stu):

A single project demonstrating the student's readiness and capacity to engage responsibly and creatively in the profession of architecture. Conceptualization and implementation of comprehensive architectural design is drawn upon previous coursework in order to thoroughly develop a project from a detailed program. Portfolio of designs aiming to integrate and synthesize structural and construction assemblies with social, economic and environmental principles of sustainability. Pre-req.: ARCH332.

ARCH 433 EXECUTION DESIGN III (3Cr.: 1Lec, 4Stu):

Development and preparation of complete sets of tender drawings for a building initially designed in ARCH332. Preparation of electro-mechanical working drawings (sanitary, lighting, power supply, and HVAC). Advanced study, analysis and interpretation of composite processes, techniques and treatments. Prerequisite: ARCH334.

ARCH 434 EXECUTION DESIGN IV (3Cr.: 1Lec, 4Stu):

Composite drawings illustrating particular execution details of sustainable features considered in a project designed in ARCH431. Preparation of Specification and quantities report for the execution of a part of the project completed in ARCH433. Pre-req.: ARCH433.

ARCH 435 URBAN DESIGN (2Cr.: 1Lec, 2Stu):

Contemporary theories of urban design. Urban environments: Keywords and definitions. Modes of critique related to the design of urban public realm. Urban environments: Scope, complexities, and responses to economic, cultural, political, social, aesthetic and natural forces. Urban design issues, methodologies and current practices. Analytical and design skills. Generating and testing alternative approaches of urban design, development of specific sites and role of urban design within particular spatial, social, economic and political contexts. Case studies and assignments in urban design methodologies, synthesis of theoretical knowledge, and communication of urban design ideas.

ARCH 436 RESEARCH AND PROGRAMMING (2Cr.: 1Lec, 2Stu):

Overview of architectural programming and pre-design stages. Review of principals, theories, methods, techniques, and tools of architectural programming. Preparation of a complete document (not less than 10,000 words in length) aiming to develop a comprehensive architectural program for a project, including assessment of client and user needs, a critical review of appropriate examples, an analysis of site conditions, a review of the relevant laws and standards and assessment of their implication on the project, and a definition of site selection and design assessment criteria.

- ARCH437 PROJECT MANAGEMENT (2Cr.: 2Lec):**
Introduction to management principles of architectural projects. Survey of the techniques and procedures of construction management as it relates to architectural design professional practice. Overview of the organization of the building team, the collaborative design process, cost control, project scheduling, purchasing, accounting, and field supervision. Introduction to the concepts of Value Engineering, partnering, and Total Quality Management.
- ARCH 438 SPECIFICATIONS AND QUANTITIES (2Cr.: 1Lec, 2Stu):**
Introduction to quantity surveying. Methods of measurement and calculations. Preparation of comparative tables of prices and bids and their evaluation. Specification writings. General conditions of contract between architect, client and contractor. Specifications for materials and various constructional works and execution procedures. Preparation of contract document for various trades and works for bids.
- ARCH533 ARCHITECTURAL CRITICISM (2Cr.: 2Lec):**
Lectures and group seminars addressing the evaluation of architectural works, ideologies and approaches. Critical review and assessment of design, interpretation, and responses by different actors. Criteria and methods of analysis and criticism. Appraisal of the delivery process and architectural product.
- ARCH534 GRADUATION THESIS (2Cr.: 1Lec, 2Stu):**
This module provides the student with an opportunity to investigate a specific topic within the realm of architecture (history and theory, technology, environment, architectural design, etc). The student will undertake sustained and in-depth research and present a coherently argued, fully referenced and appropriately illustrated piece of academic writing not less than 10,000 words in length. The module will develop research methods relevant to writing a dissertation, and student's intellectual curiosity and critical thinking relating to the dissertation topic.
- ARCH 535 BUILDING REGULATIONS AND PROFESSIONAL PRACTICE (2Cr.: 2Lec):**
Introduction to building legislation and codes. Theoretical and analytical investigation of methods available to architects. Legal, ethical and professional obligations. Clients and other parties affected by both the practice and business of architecture. Overview of construction industry. Office practice including accounting and financial reporting, employment, procurement of buildings, tendering, building contract administration. Control of cost, time and quality, quality assurance. Programs and regulatory constraints, building legislations, building law and ordinances, urban planning legislation and housing laws, syndicate regulations, servitude and labor union laws.

ARCH536 DESIGN AND BUILDING ECONOMICS (2cr.: 2lec):

Overview of factors influencing design and building costs, and approaches to managing costs from initial project definition through construction and use. Techniques for project budgeting, cost estimating, and life cycle cost analysis. Feasibility, cost and value, economic analysis, real estate market. Cost and benefit ratio analysis, and control of cost and depreciation, cost estimating, including determination of materials, labor, equipment, overhead, profit, and other construction costs.

ARCH537 ARCHITECTURAL DESIGN VII (5 Cr.: 0Lec, 10Stu):

Portfolio of designs aiming to study the physical, social, economic, and environmental aspects of urban design, land uses, housing, circulation, densities, and local identity seen from a global perspective. Advanced design problems are approached by applying knowledge and skills acquired from previous design studios. Students are expected to demonstrate technical competencies, knowledge, critical thinking and creative synthesis skills relative to a precise theoretical and practical hypothesis or proposition, communicate intentions and results clearly. Pre-req.: ARCH432.

ARCH539 PROJECT PROGRAMMING (3Cr.: 1Lec, 4Stu):

A research studio-seminar course aiming to develop student independence in defining an Architecture Senior Project. Student must simultaneously address and integrate all aspects of the design/research proposal in a comprehensively developed dissertation. This written document should incorporate research, program development, site definition and analysis of contextual constraints that discusses all design decisions to be considered in the design stage. Pre-req.: ARCH432.

ARCH 540 SENIOR PROJECT (8 Cr.: 0Lec, 16Stu):

This Final Design studio is an opportunity for students to develop an individual senior project addressing various factors in the design process. Syntheses should demonstrate understanding and resolution of different issues analyzed in the design of the building, from the understanding of context, to structural and environmental systems, down to the details of construction. Project outcomes are developed with consideration given to social, cultural, ethical, environmental, accessibility, safety, and reliability factors. Detailed representation of complete project aims to interpret comprehensive understanding of architectural design as a holistic approach. Pre-req.: ARCH434, ARCH537, ARCH539.

ARCH 541 ARCHITECTURE INTERNSHIP (0Cr: 0Lec):

A supervised 8 weeks summer training period at an approved Architecture firm (consulting, contracting, etc.) intended to provide students with hands-on experience at the work place. This training may involve office work, field trip, site supervision, or an architectural design workshop that is jointly organized by the Faculty and other local or international institutions / universities. In either option, evaluation is based on: daily performance, supervisors input, student’s report, and a short presentation; students are required to submit comprehensive summer training reports together with the necessary proof of documents.

Major Elective Courses

Courses			crs.	Pre/Co-requisites
ARCH	261	Introduction to Painting	2	
ARCH	262	History of Arts	2	
ARCH	263	Architectural Photography	2	
ARCH	264	Perspective and Rendering	2	
ARCH	361	Architecture and Environment	2	
ARCH	362	Social Studies in Architecture	2	
ARCH	363	Theory of Housing	2	
ARCH	364	Virtual Reality	2	Pre: ARCH278
ARCH	365	Graphic Design	2	Pre: ARCH278
ARCH	461	Architecture Landscape	2	
ARCH	462	Vernacular Architecture	2	
ARCH	463	Intelligent Buildings	2	
ARCH	464	Geographic Information System	2	
ARCH	465	Building Information Modeling	2	
ARCH	466	Environmental Psychology	2	
ARCH	561	History of Islamic Arts	2	
ARCH	562	Conservation of Historic Buildings	2	
ARCH	563	Regionalism in Architecture	2	
ARCH	564	Site Planning	2	
ARCH	565	Urban Morphology	2	
ARCH	566	Environmental Assessment	2	
ARCH	567	Topics in Architecture	2	

Description of Major Elective Courses

- ARCH261** INTRODUCTION TO PAINTING (2Cr.: 1Lec, 2Stu):
Study of painting language through color, form, materials, and techniques. Aspects of traditional and modern pictorial composition including proportion, space, and color theory through the representation of a variety of subjects.
- ARCH262** HISTORY OF ARTS (2Cr.: 2Lec):
Tracing the evolution of arts through historical periods. Review of different movements and schools. Contexts, values, and cultural influences. Principal features, designs and characteristics. Analysis and comparative studies.
- ARCH263** ARCHITECTURAL PHOTOGRAPHY (2Cr.: 1Lec, 2Stu):
Basic elements and processes of architectural photography to include camera controls, exposure technique, photo processing, and fundamental principles of photographing architecture. In-depth photo essays relating to architecture, the urban movement, or landscape design following the introduced principles.
- ARCH264** PERSPECTIVE AND RENDERING (2Cr.: 1Lec, 2Stu):
Theoretical principles of perspective: one vanishing point, two vanishing points, three vanishing points, interior perspective. Rendering techniques, architectural delineation, principles of shade and shadow. Exercises on architectural applications, drawing perspective views using conventional and computer methods.
- ARCH361** ARCHITECTURE AND ENVIRONMENT (2Cr.: 2Lec):
Basic theories and interpretations of environmental studies in relation to the built environment. Review of environmental concerns and their scope. Environmental problems, pollution, threats and impacts of human actions. Design of the built environment engaged with the natural environment. Influence of natural elements on the making of architecture. Relationship of architecture to site and landscape.
- ARCH362** SOCIAL STUDIES IN ARCHITECTURE (2Cr.: 2Lec):
Introduction to the field of sociology, definitions and scope of social studies. Social and cultural characteristics in different societies. Understanding of issues and factors that motivate and influence architectural design and theory, and how architecture is shaped by and shapes cultural concerns and social organization.
- ARCH363** THEORY OF HOUSING (2Cr.: 2Lec):
Introduction to contemporary theories and concerns in the field of housing. Roots of housing problem. Housing typologies and classification. Housing sector. Mechanisms and forces shaping the housing market. Factors affecting supply and demand. Economics of housing projects. Feasibility studies. Housing policies and role of government. Residential areas and suburbia. Problems, considerations, and alternative approaches applied in the field.

- ARCH364** VIRTUAL REALITY (2Cr.: 1lec, 2Lab):
The dual realm of design, computer modeling and visualization. Critical appreciation of digital media, interpreting real and imaginary 'worlds' from literature in the form of multimedia digital models. Emphasis on experimentation, imagination and technical competence through digital media. Pre-req.: ARCH278.
- ARCH365** GRAPHIC DESIGN (2Cr.: 1lec, 2Lab):
Nature and scope of graphic design. Conceptual development. Innovation, technique and presentation. Skills in the areas of representation: logos, packaging, branding and identity, web design and motion graphics. New techniques and methods of artistic expression: issues and directions. Integration of message and content. Innovation, creativity and high standard graphic design. Pre-req.: ARCH278.
- ARCH461** ARCHITECTURE LANDSCAPE (2Cr.: 2Lec):
Various theories of architectural landscape, principal landscape design concepts and processes, scope, components and elements, environmental knowledge, contexts and landscape preferences. Design considerations, skills, and scales. Alternative approaches and professional practices. Critique of recent local and international cases of landscape design.
- ARCH462** VERNACULAR ARCHITECTURE (2Cr.: 2Lec):
Scope and key definitions. Surveying vernacular architecture. Culture and place influences. Local trends, traditions, and practices. Elements and components. Lessons and values. Connections, continuity and future prospects.
- ARCH463** INTELLIGENT BUILDINGS (2Cr.: 2Lec):
Environmental concerns underlying responsive design. Definitions and components of intelligent buildings. Principles of interactive design. Management of indoor environments. The building envelope, automated technologies and smart materials. Integrated building management systems. Efficient use of energy, utilization of renewable energy systems, sustainable management of resources. Analytical techniques and computing tools for studying and assessing building energy and environmental performance.
- ARCH464** GEOGRAPHIC INFORMATION SYSTEM (2Cr.: 1Lec, 2Lab):
Information management and decision-making support tools used in urban studies. Definition of GIS. Overview of the range of GIS applications (data acquisition, secondary data generation, analysis and management of data, factor combination and GIS-based modeling. Use of GIS in decision-making. Integration of GIS with other technologies used in the field of urban studies.

- ARCH465** BUILDING INFORMATION MODELLING (2Cr.: 1Lec, 2Lab):
Fundamentals of Building Information Modeling (BIM) as a construction documentation system. Introduces concepts and features of BIM. Includes software structure and features, modeling and editing techniques, and sheet creation and organization. Focuses on applying BIM software to develop a set of construction documents. Simulates project development and documentation.
- ARCH466** ENVIRONMENTAL PSYCHOLOGY (2Cr.: 2Lec):
The aim of this course is to help students to create more effective and appropriate environments that address human needs. The Course investigates the interrelationships among the physical environment, natural environment, individual differences, and human behavior and experience. Student are taught to explore the distinctive features of environmental psychology in relation to other forms of psychology, the origin of environmental psychology and how an understanding of human behavior influences and informs responsible design decision making. Emphasis is on the effect of design decisions on human behavior in interior and exterior spaces.
- ARCH561** HISTORY OF ISLAMIC ARTS (2Cr.: 2Lec):
Overview of the cultural history of Islamic societies as expressed by their art and architecture from the 7th century to the present. Changes in artistic styles, architectural advances and expression of the written word compared across time and geography to understand how Islam influenced and was influenced by society throughout history.
- ARCH562** CONSERVATION OF HISTORIC BUILDINGS (2Cr.: 2Lec):
Introduction to historic conservation. Cultural considerations. Values and ethics of conservation. Procedures, surveys and documentation. Degrees of intervention. Causes of decay: natural and man-made. Structural behavior in elements of historic buildings. Techniques and practices. Examples and approaches.
- ARCH563** REGIONALISM IN ARCHITECTURE (2Cr.: 2Lec):
The course investigates various and evolving definitions of regionalism and theoretical approaches to the problem of designing architecture that reflects its time, place, culture and environment. Thus, the shape of buildings and environments are studied in relation to climate, landscape, availability of resources and cultural backgrounds. It explores the concept of regionalism in architecture; local architectural models around the world; the power of invented regionalism; the persistence of regional revivals; and the impact of regional architecture in historic preservation.

ARCH564 SITE PLANNING (2 Cr.: 1Lec, 2Stu):

Theory, practice and impacts of site planning: zoning, growth management, methods and techniques of land use control. Site identity and character. Systematic surveys and site analysis. Physical, cultural and economic contexts. Critique of recent cases of site planning. Developing land use plans and guidelines, land use ordinances and legal frameworks.

ARCH565 URBAN MORPHOLOGY (2Cr.: 2Lec):

Nature of urban morphology. Systematic study of morphology: Elements, components and relationships. Morphology in relation to urban contexts. Variables and parameters. Morphology and local identity. Approaches to deal with particular morphologies within urban contexts.

ARCH566 ENVIRONMENTAL ASSESSMENT (2Cr.: 2Lec):

Environmental Impact Assessment for projects (EIA). Strategic Environmental Assessment for policies, plans and programs (SEA). Identifying significant environmental impacts. Environmental management through assessment, prevention, restoration and mitigation of environmental impacts. Preparation of environmental impact statements. Description of decision-making process and tools. Environmental sampling and monitoring programs. Analysis and evaluation of proposed solutions, technical feasibility, examination of case studies.

ARCH567 TOPICS IN ARCHITECTURE (2Cr.: 2Lec):

A focused investigation of selected issues in architecture, architectural design or urbanism. Specific course will vary and will be defined by individual instructors.

Study Plan

Bachelor Degree in Architectural Engineering (170 Credit Hours)

First Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	*271	Architectural Design Fundamentals: Visual Studies	6	
ARCH	*273	Building Construction I	2	
ARCH	275	History of Architecture I	2	
ARCH	277	CAD Drawing	2	
ARCH	279	Architectural Sketching	2	
		Elective (General) ¹	2	
		Elective ²	2	

Second Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	272	Architectural Design Fundamentals: Physical Studies	5	Pre: ARCH271
ARCH	274	Building Construction II	3	Pre: ARCH273
ARCH	276	Theory of Architecture I	2	
ARCH	278	Computer Graphics	2	Pre: ARCH277
ARCH	280	Academic Writing	2	
		Elective (General) ¹	2	
		Elective ²	2	

Third Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	*291	Architectural Design I	5	Pre: ARCH272
ARCH	*293	Building Construction III	3	Pre: ARCH274
ARCH	295	History of Architecture II	2	
ARCH	297	Theory of Colors	2	
CVEE	231	Theory of Structures for Architects	2	
		Elective (General) ¹	2	
		Elective ³	2	

Fourth Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	*292	Architectural Design II	5	Pre: ARCH291
ARCH	*294	Building Construction IV	3	Pre: ARCH293
ARCH	296	Theory of Architecture II	2	Pre: ARCH276
ARCH	298	Indoor Environmental Control	2	
CVEE	232	Concrete and Steel Structures	2	
		Elective (General) ¹	2	
		Elective ³	2	
Fifth Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	*331	Architectural Design III	5	Pre: ARCH 292
ARCH	*333	Execution Design I	3	Pre: ARCH294
ARCH	335	History of Architecture III	2	
ARCH	338	City and Town Planning	2	
MECH	331	HVAC and Sanitation for Architects	2	
		Elective (General) ¹	2	
		Elective ³	2	
Sixth Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	*332	Architectural Design IV	5	Pre: ARCH331
ARCH	*334	Execution Design II	3	Pre: ARCH333
ARCH	336	Theory of Architecture III	2	
ARCH	337	Interior Design	2	
ARCH	339	Environmental Design	2	
		Elective (General) ¹	2	
		Elective ⁴	2	
Seventh Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	*431	Architectural Design V	5	Pre: ARCH332
ARCH	*433	Execution Design III	3	Pre: ARCH334
ARCH	435	Urban Design	2	
ARCH	437	Project Management	2	
CVEE	331	Soil Mechanics & Foundations, and Material Properties & Testing	2	
		Elective ⁴	4	

Eighth Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	*432	Architectural Design VI	5	Pre: ARCH431
ARCH	*434	Execution Design IV	3	Pre: ARCH433
ARCH	436	Research and Programming	2	
ARCH	438	Specifications and Quantities	2	
CVEE	332	Surveying for Architects	2	
		Elective ⁵	4	

Ninth Semester (14 Credits)			Crs.	Pre-/co-requisites
ARCH	537	Architectural Design VII	5	Pre: ARCH432
ARCH	537	Project Programming	3	Pre: ARCH432
ARCH	534	Graduation Thesis	2	
ARCH	535	Building Regulations and Professional Practice	2	
ARCH	541	Architecture Internship	0	
		Elective ⁵	2	

Tenth Semester (18 Credits)			Crs.	Pre-/co-requisites
ARCH	540	Senior Project	8	Pre: ARCH537 ARCH539 ARCH434
ARCH	533	Architectural Criticism	2	
ARCH	536	Design and Building Economics	2	

1) A total of 12 credits is required as General University Requirements; 5 credits are selected from the University Mandatory Courses list including ARAB 001 (2Cr.), ENGL 001 (2Cr.), BLAW 001 (1Cr.) and another 7 credits are selected from the University Elective Courses list.

- The list of the university requirement courses and their descriptions are presented in the introductory pages of this catalogue.

2) Selected from the list of Faculty Elective Courses offered at the "200 Level".

3) Selected from the list of Faculty Elective Courses offered at the "300 Level".

4) Selected from the list of Faculty Elective Courses offered at the "400 Level".

5) Selected from the list of Faculty Elective Courses offered at the "500 Level".

* These core modules are separated and independently graded courses. Students failing the first module (Fall Sem.) is not allowed to register in the second one (Spring Sem.).