



**Al Ahliyya Amman University
Faculty of Architecture and Design
Department of Architectural Engineering
Course Description**

Short Course Description

First: University Requirements (27 Credit Hrs)

Second: Faculty Requirements (24 Credit Hrs)

A. Compulsory Faculty Requirements (18 Credit Hrs)

1021701 Drawing and Painting (1) {3} [2-3]

The elements and principles of composition through art works achieved in studio or on location or by expressing: concepts, ideas, and creative imaginations; Applications: using dry techniques of (pencils, charcoal, colored pencils, soft pastels), or wet techniques of (water color and acrylic).

Prerequisite: none

1021702 Drawing and Painting(2){3} [2-6]

Human body , still life , landscape and narrative painting , concentrate on the development of conceptual , perceptual and technical evolution of these subject , in the history of painting .

Special attention is also given to experimental approaches of variety of media and acrylics, which the process must be close to the expression of the masters and contemporary practitioners.

Prerequisite: 1021701 Drawing and Painting(1)

1023501 Digital and Traditional Photography {3} [2-6]

A historical overview of photography: from its beginnings in the nineteenth century to the present; Practical application: camera technology and its aesthetics, images making techniques, applications in studio and on visual concepts in photography and design.

Prerequisite: 1031102 Design Principles (2)

1031101 Design Principles (1) {3} [2-6]

Basic design principles: design elements, color theory, and two- and three-dimensional compositions; Emphasis on abstract compositions.

Prerequisite: None

1031102 Design Principles (2) {3} [2-6]

Designing for man: Elaborate study of anthropometrics and ergonomics, human scale, and the mutual man-environment relationship; The mass-space relationship in various exercises that combine the basics of architectural, interior, and graphic design.

Prerequisite: 1031101 Design Principles (1)

1031201 Visual Communication Skills (1) – Architectural Drawing {3} [2-6]

Various kinds of architectural drawing and drafting: the terms, symbols, and conventions used in such drawings.

Prerequisite: None

1031501 History of Art and Architecture (1) {3} [2-3]

The history of global art and architecture: Analytical review of the development of art and architecture in the ancient world and the dawn of civilizations in Mesopotamia, the Nile Valley, some of the early civilizations in south and east Asia, and the Classical Greek and Roman civilizations; The major architectural achievements of each civilization or culture: The relationship between them, with major examples of each.

Prerequisite: None

B. Elective Faculty Requirements (6 Credit Hrs)

1022305 Aesthetic Culture {3} [3-3]

Aestheticism; the form and function of the various arts of cultural display and performance; artistic creation processes; methodologies of art appreciation throughout the background of social and historical situation of different civilizations; the elements of art work to develop popular attitudes towards art.

Prerequisite: none

1023305 Theories of media {3} [3-3]

The portal in the theories of information: theories and schools of different basic and important to study the mass media and its impact on the consumer, the role played by the newspaper and magazine, radio and television in our society Modern.

Prerequisite: none

1033207 Computer-Aided Design (1) {3} [2-6]

The methodology of designing with computers: achieving a balance between architectural thought and the technicalities of computer drawing; Practical application: through a number of simple exercises that deal with the basics of computer drawing programs.

Prerequisite: 1031201 Visual Communication Skills (1)

1035702 Communication Skills and Professional Ethics

Training of the established basics for effective written composition in the business world: types of communication as processes, description of mechanisms, proposals, and reports; Applied exercises; quizzes; a final applied exam to reinforce sentence clarity and effectiveness; Each student will: receive skill-appropriate, personal feedback and instruction from an experienced, qualified writing instructor.

***Prerequisite:* 771101 English Language (1)**

Third: Department Requirements (106 Credit Hrs)

A. Compulsory Department Requirements (73 Credit Hrs)

1032103 Architectural Design (1) {3} [2-6]

Architectural design: design simple actual structures with limited functional requirements yet with varied areas and usages on more than one level; emphasis on the form-function and outside-inside relationships, Practical application: all within a simple design methodology that may lead the student step by step throughout the design process.

***Prerequisite:* 1031102 Design Principles (2)**

1032104 Architectural Design (2) {3} [2-6]

Designing more complex buildings: visual and functional aspects, and on the structural, economic, social, and environmental factors influencing the design.

***Prerequisite:* 1032103 Architectural Design (1)**

1032202 Visual Communication Skills (2) –Shades, Shadows & Perspectives {2} [2-4]

Methods of producing various kinds of perspective drawings: one-point and two-point interior, exterior perspectives; projection of various shades & shadows.

***Prerequisite:* 1031201 Communication Skills (1)**

1032203 Visual Communication Skills (3) – Architectural Presentation {2} [2-4]

Skills and techniques required for the presentation of architectural drawings and models using a variety of the most common media, the representation of various textures, shades and shadows, etc.

***Prerequisite:* 1032202 Communication Skills (2)**

1032301 Building Construction (1) {2} [2-2]

Construction and finishing materials: their nature, characteristics, and sources; building construction systems; the relationship between structural systems and the other engineering systems that together comprise a building.

***Prerequisite:* 1031102 Design Principles (2)**

1032302 Building Construction (2) {2} [2-4]

A theoretical basis about major building parts: walls, columns, floors, roofs, doors and windows, stairs, damp-proofing, etc., and their detailing; Practical application: exercises where the student is required to design the various details for specific parts of a building.

***Prerequisite:* 1032301 Building Constructions (1)**

1032205 Computer Applications in Architecture (1) {2} [2-4]

The use of computers in producing simple 2D and 3D architectural drawings: basic architectural design drawings, working drawings, furniture and accessories using AutoCAD.

***Prerequisite:* 1032103 Architectural Design (1)**

1032403 Architecture and Environment {2} [2-2]

The mutual relationship between architecture and its natural context: the aspects that need to be taken into consideration before during and after design; A revision of the international laws regarding protecting the environment and natural resources and the effects of the natural elements the building shell and its spaces.

***Prerequisite:* 1032103 Architectural Design (1)**

1032502 History of Art and Architecture (2) {3} [2-3]

An analytical review of the development of art architecture in: Early Christianity and the Middle Ages (Byzantine, Romanesque, and Gothic Ages), the Renaissance, Mannerism, Baroque and Rococo, Rationalism; Some of the movements until mid-19th century; The major architectural achievements of each age: the relationship between them, major examples of each.

***Prerequisite:* 1031501 History of Art and Architecture (1)**

1032503 History of Art and Architecture (3) {3} [2-3]

The development of architecture under Islamic rule: a brief review of the pre-Islamic era, the major developments in the age of the Rightly Guided Caliphs; An analytical review of the major architectural developments and achievements under the rules of the: Umayyids, Abbasids, Muslims in Andalusia, Fatimids, Ayyubids, Mamluks, Timurids, Safavids, Moguls, and Ottomans; The major architectural achievements of each age: the relationship between them, major examples of each.

***Prerequisite:* 1032502 History of Art and Architecture (2)**

1032509 Research Methodology for Architecture {2} [2-2]

An introduction to the concept of research in general: the special nature of research for architectural purposes whether prior to design projects or that oriented towards report writing and preparing for seminars; acquainted with the major kinds of research and their methodologies as regards data collection: analysis, interpretation, evaluation, and making recommendations; acquainted with methods and techniques for presenting their research and its results using various means.

***Prerequisite:* 771101 English Language (1)**

1033105 Architectural Design (3) {4} [2-8]

The design of buildings with typical and repetitive spaces over more than one floor within specific building types; fitting the various (formal, functional, structural, environmental, etc.) systems together that comprise the building.

***Prerequisite:* 1032104 Architectural Design (2)**

1033106 Architectural Design (4) {4} [2-8]

More sophisticated design problems combine typical spaces with other various spaces with a variety of masses and/or building blocks.

***Prerequisite:* 1033105 Architectural Design (3)**

1033206 Computer Applications in Architecture (2) {2} [2-4]

Using certain computer programs in architectural drawing and rendering; animation for architectural purposes.

***Prerequisite:* 1032205 Computer Applications in Architecture (1)**

1033504 Modern and Contemporary Architecture {2} [2-2]

An analytical review of the development of architecture since mid-nineteenth century and the roots of Modernism; the major movements of twentieth century up till the present; major examples of each; a discussion of the relationship between architecture and the other arts of the time.

***Prerequisite:* 1032502 History of Art and Architecture (2)**

1033505 Theory of Architecture and Design {2} [2-2]

The theoretical and intellectual side of architecture and architectural design as a combination of art and science: the concepts of "theory", "architecture", "art", and "design" and their respective definitions; the role of theory in architectural design and its relationship to the history and criticism of architecture (HTC); The relationship between architectural theory and the humanities: the kinds of architectural theories, design methods and methodologies, the stages of design and their respective requirements and presentations.

***Prerequisite:* 1032104 Architectural Design (2)**

1034107 Architectural Design (5) {4} [2-8]

The design of more sophisticated and complex buildings: mainly multipurpose of multifunctional public or commercial buildings which call for systemic design with an overall planning grid to insure compatibility between the various systems of the building; A hierarchical design approach starting with an overall design and ending up with the details.

***Prerequisite:* 1033106 Architectural Design (4)**

1034108 Architectural Design (6) {4} [2-8]

Continuation of its predecessor with more complexity and on a larger scale as it deals with large-scale structures with systemic design over two stages: first the overall planning and design as a teamwork, then the detailed design of selected parts as individual work.

***Prerequisite:* 1034107 Architectural Design (5)**

1034303 Building Construction (3) {3} [2-6]

The production of a complete set of fully detailed working drawings for a building: how to show dimensions, measurements, levels, etc; writing specifications for various parts and finishes at various scales.

***Prerequisite:* 1032302 Building Construction (2)**

1034304 Lighting and Acoustics {2} [2-2]

Lighting: the nature of light, its physical characteristics, their units of measurement, the psychological aspects of light, types of lighting and its sources, and lighting design; Acoustics: the nature of sound, its physical characteristics and their units of measurement, the psychological aspects of sound and their effects on man, architectural acoustics and their problems and design solutions.

***Prerequisite:* 1033105 Architectural Design (3)**

1034506 Behavioral Studies {2} [2-2]

The behavior of humans and other living creatures in the living environment: the dynamic interaction between such behavior and the living spaces, an analytical review of the history of architectural behavioral design; Among the concepts touched upon here: perception, cognition, meaning, privacy, social interaction, etc.

***Prerequisite:* 36133 Engineering Physics & 1033105 Architectural Design (3)**

1034601 Urban Planning {3} [2-3]

The definition of the concept of planning and its various kinds and levels: the elements of the built environment, the major theories in urban planning and the design of urban places, land use planning, and the relevant laws and legislations

***Prerequisite:* 1034107 Architectural Design (5)**

1034603 Landscape Architecture

A brief historical review of landscape architecture; the main principles of planning and designing various locations on both urban and local architectural scales: outside and inside of buildings, soft and hard design elements involved, furniture and accessories, etc; Practical application: previous information is then to be applied in practical design exercises and projects.

***Prerequisite:* 1033105 Architectural Design (3)**

1034604 Architectural Conservation and Restoration {2} [2-2]

An introduction to the field of architectural conservation and restoration: the main principles, theories, and rules of the conservation of architectural heritage; the main methods of maintenance: restoration, rehabilitation, and reuse of buildings; a review of the major international achievements in this field.

***Prerequisite:* 1032503 History of Art and Architecture (3)**

1034799 Field Training {0} [0-0]

Obtaining the degree of Bachelor of Architectural engineering in this college requires a term of practical training at an accredited architectural or engineering consultancy firm or institution (consisting of (8) weeks locally, or (6) weeks abroad).

***Prerequisite:* Completion of at least (100) Cr. Hrs.**

1035109 Graduation Project (1) {2} [2-2]

Preparing for the graduation project by conducting the research necessary for designing: a building program for a real project on a real site within the city, follow a clear and comprehensive methodology that leads the student through the process of defining the design problem and planning the course of resolving it, collecting the necessary data, the proposal of a number of conceptual design alternatives; the presentation of the research in a final report.

***Prerequisite:* 1034108 Architectural Design (6) & Completion of 120 Cr. Hrs.**

1035110 Graduation Project (2) {4} [2-8]

Designing the project for which the student had done his research by: deciding upon the best alternative proposed, then developing it into a design proposal that reflects his own character and architectural identity, combines together the various building systems into

one integrated whole; presenting his comprehensive design proposal in the form of architectural drawings and one or more architectural models.

Prerequisite: 1035109 Graduation Project (1)

1035602 Urban Design {3} [2-6]

A general introduction to the theories and concepts of urban planning: the fundamentals of urban design and its effect on the built environment, the various theories, methodologies, and methods of urban planning; Practical application: previous information to be applied to practical exercises and projects.

Prerequisite: 1034601 Urban Planning

1035701 Professional Practice and Legislation {2} [2-2]

Introduction to the world of professional practice and the nature of architecture as a profession: the role of laws and legislations, the role of the Engineers' Union, the organization of architectural and engineering consultancy offices, firms, and various institutions, professional conduct and ethics; quantity surveys and calculations; specification writing; contracts and tenders.

Prerequisite: 1034108 Architectural Design (6)

B. Supportive Department Requirements (29 Credit Hrs)

36112 Mathematics (1) {3} [2-3]

Differentiation and application; complex numbers; analytical geometry; method of integration; infinite series; power series; vectors in three dimension; equations of line and plane in 3 dimension; complex power series; complex integration.

Prerequisite: None

36133 Physics for Engineering {3} [2-3]

Physics and measurements; vectors; motions in one and two dimensions; laws of motion; circular motion; Newton's laws; work and energy; law of gravity linear momentum; and collisions; rotation of a rigid object about a fixed axis; rolling motion; angular momentum and torque; static equilibrium and elasticity; oscillatory motion.

Prerequisite: None

0831001 Engineering Workshops {1} [1-3]

Mechanical works: hand filing, turning, welding, metal cutting, casting and molding, electrical circuits (elements of electrical circuits, open and closed circuits, AC/DC circuits), instruments and measurements, electrical installations (incl. plans, equipment, protection, motor and machine installations); carpentry works: types of timber, timber works, equipment and tools, painting and finishing.

Prerequisite: None

0831002 Engineering Drawing {2} [2-4]

Use of instruments: lettering, graphic geometry, orthographic projection, isometric drawing and sketching, sectional views, computer-aided design; Applications in: civil, mechanical, architectural and electrical engineering.

Prerequisite: None

0834001 Engineering Services {2} [2-2]

Lighting and acoustics: the lighting-related part covers the essence of light, its physical attributes and their methods of measurement, the psychological attributes of light, kinds of lighting and their sources; Lighting design with regard to form: distribution, intensity, and quality; The acoustics-related part covers the essence of sound and the nature of sounds, the physical attributes of sound and their methods of measurement, the psychological attributes of sound and their effects on man, the kinds of architectural acoustic problems and how to solve them through spatial design and/or building materials, the use of the relevant

***Prerequisite:* 1033105 Architectural Design (3)**

0862003 Engineering Statistics {3} [2-3]

Randomness; introduction to probability theory and probability distributions; discrete and continuous probability distributions; univariate analysis; decision theory (Bays' theorem); hypothesis testing; confidence intervals and tolerance limits; correlation; regression analysis; analysis of variance; time series; nonparametric methods.

***Prerequisite:* 36112 Mathematics**

0862107 Mechanics of Materials {3} [2-3]

Basic concepts and units of measurement: force vectors, equilibrium of a particle, force system resultants, equilibrium of rigid bodies, structural analysis of trusses, internal forces of structural members, center of gravity and centroid, moment of inertia, flexural and shear stresses for beams.

***Prerequisite:* 36133 Physics for Engineering**

0862307 Surveying and Measured Drawing {2} [2-2]

Fundamentals of surveying: units of measurement, scaling, linear measurements, leveling, the theodolite, angular measurements, contour lines, polygon areas and grids, areas and volumes, traversing, triangulation, making building measured drawings.

***Prerequisite:* 36133 Physics for Engineering**

0862308 Surveying Lab {1} [1-3]

Practical exercises in: field surveying covering linear measurements and EDM, angular measurements, leveling; areas and volumes, traversing; triangulation, photogrammetry.

***Concurrent:* 0862307 Surveying and Measured Drawing**

0863208 Structural Analysis {2} [2-2]

Fundamentals of structural analysis; Stability; determinacy and indeterminacy; Analysis of statically determinate trusses; Analysis of statically determinate beams; Analysis of statically determinate frames.

***Prerequisite:* 0862107 Mechanics of Materials**

0864005 Engineering Economy and Management {3} [2-3]

Engineering project development: decision making, basic concepts of capital investment, formulas and applications; rates of return; economic feasibility of projects (net future value, net present value, and equivalent uniform cash flow); comparison of mutually exclusive proposals; benefit-cost ratio method; depreciation; corporate taxation; resource allocation: optimization process, linear programming.

***Prerequisite:* 0862003 Engineering Statistics**

0864209 Concrete and Steel Structures {2} [2-2]

Reinforced concrete: Load calculations according to ACI code, flexural reinforcement calculations according to strength design method, design of simple beams subjected to moment and shear, column design; Steel: Introduction, Load calculations according to LRFD, design of tension members, design of compression members, design of beams according to LRFD code.

***Prerequisite:* 0853208 Structural Analyses**

C. Elective Department Requirements (6 Credit Hrs)

1034208 Computer-Aided Design (2) {3} [2-6]

The methodology of designing with computers: achieving a balance between architectural thought and the technicalities of computer drawing through a number of advanced design exercises.

***Prerequisite:* 1033207 Computer-Aided Design (1)**

1034507 Vernacular and Regional Architecture {3} [2-3]

Main characteristics of vernacular and regional architecture: the discussion of major local examples, the use of the various local resources for the production of an intrinsically local architectural work.

***Prerequisite:* 1033105 Architectural Design (3)**

1034511 Art and Architectural Criticism {3} [2-3]

The concept of criticism in its various aspects: art and applications to architecture; criticism as a creative process: both theoretical and critical sides, theoretical side tackles basic terminology and key concepts; Art and architecture criticism, a brief review of existing critical theories, the constituents of criticism, the stages of the critical process, etc.; The practical side is an application of the theoretical.

***Prerequisite:* 1032505 Theory of Architecture and Design**

1034605 Housing {3} [2-3]

The concept of housing and its development locally and internationally: the planning and organization of residential neighborhoods and their main constituents, community services in residential areas, the effect of the residential environment on social relationships, types of residential buildings and the main characteristics of each, squatters' settlements, and the housing market.

***Concurrent:* 1034601 Urban Planning**

1035001 Special Topics in Architecture {3} [2-3]

Handling certain architectural topics to be decided upon by the department at its time for certain reasons: These topics may be selected due to their associations with other disciplines or fields of knowledge, or due to their social, political, economical, environmental, etc. significance at the time.

***Prerequisite:* None**

1035111 Interior Architecture {3} [2-6]

Interior design with more elaboration and detail than in the architectural design courses; the preparation of an interior design project, space planning and design taking into account all aspects of materials, furniture, furnishings, and accessories, engineering services, and the supervision of the implementation of the project, aspects of industrial design.

Prerequisite: 1032104 Architectural Design (2)

1035402 Sustainable and Green Architecture {3} [2-3]

The concept of sustainability: the objectives of sustainable development, the optimization of the use of national resources in architecture, and the design of green and organic spaces that may provide better living environments for all living creatures.

Prerequisite: 1032403 Architecture and Environment

Fourth: Free Subjects (3 Credit Hrs)

Free Subject {3} [-3]

To fulfill this requirement, students may freely choose any subject offered at any Department within the University.