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Curriculum for the Bachelor Degree in Architectural Engineering

Courses Description

ARE 0193	Introduction to architecture drawing	3(1-6)
Engineering drawing Enable the student to acquire basic skills in architectural drawing through a series of lectures and exercises on drawing lines, surfaces and shapes with training in engineering projections in preparation for drawing various architectural plans, which include plans, facades, sections and stereoscopic perspectives.		
Prerequisite:-		
ARE 0267	Specifications, contracts, and calculation of quantities	3(3-0)
In this course, the principles of measurement, numbering, and detailed description of all the items of internal architectural and service works in the construction of buildings are presented, the technical conditions and principles applied to the implementation of buildings in accordance with the general and special technical specifications and conditions in Jordan, the study of agreement models for the establishment of architectural projects, the preparation of technical specifications and the calculation of quantities, the project is small in size and Learn about extrapolation of specifications and technical tables.		
Prerequisite:ARE 0336		
BSE0102	Engineering workshop	1(0-3)
Occupational safety and health in engineering workshops, mechanical forming of metals, machining operations, welding processes, carpentry works, electrical installation.		
Prerequisite:-		
ARE 0209	Ethics and communication skills	3(3-0)
This course deals with the main principles of communication and interaction skills with others, as well as the basics of listening skills and listening to others, skills of asking questions and managing dialogue, skills of presenting dialogue to others, skills for resolving disputes in the right way, introducing the skills of using body language as well as communication and interaction positive with the others.		
Prerequisite:-		
BSE0202	Statistics and Probabilities for Engineers	3(3-0)
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:30202101		
BSE0401	Engineering economy	3(03-0)
Engineering Economy: engineering economic concepts; interest formulas; decision making using present worth, future worth, annual worth, internal rate of return and benefit- cost ratio methods; payback analysis; depreciation.		
Prerequisite: passing 80 Cr. Hrs.		
ARE 0191	Free Hand drawing (1)	1(0-3)
This course aims to understand the artistic and architectural elements of their size, texture, colors, and materials involved in their formation and to learn ways of expressing them by hand drawing, as well as how to draw plants, bodies, metal blocks and people using pencil and different colored pencils, and to introduce the mechanisms of enlarging and projecting scenes through individual and group practical exercises.		
Prerequisite:-		
ARE 0190	Free Hand drawing (2)	1(0-3)
This course aims to study digital photography and the fields that it enables to display artistic formations in general and architectural forms in particular, as well as presenting the principles of two- and three- dimensional composition and building models of abstract shapes. In addition to studying architectural display using the technique of pencils, Chinese ink and watercolors, as well as techniques of architectural display using computer programs.		
Prerequisite: ARE 0191		



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ARE 0185	Introduction to Architectural Design (1)	3(1-6)
This course aims to introduce the basic principles and methodology in design. The course develops ideas and skills in creating two- and three-dimensional abstract shapes in addition to building models to implement the elements of various architectural and artistic formations.		
Prerequisite:-		
ARE 0186	Introduction to Architectural Design (2)	3(1-6)
The course aims to develop design skills, as it reviews the steps of the design process with emphasis on form formation and the interaction between shape, space, containment, and spatial relationships with each other. It reviews matters related to space, form, and order, and transforms them into meaning, function, and construction, with linking them to the site, in addition to training on studying and documenting existing buildings. At the end of the course, the student designs a simplified building on one of the flat sites.		
Prerequisite:-ARE0185		
ARE 0192	Architectural drawing	3(1-6)
Means of architectural expression in drawing ,architectural projection, engineering perspective, dealing with one point vanishing point two-point perspective, interior and exterior perspective with various architectural drawing exercises, studying shadows and shadows and building them on different projections, projecting buildings in their various shapes and multiple configurations.		
Prerequisite: ARE 0193		
ARE 0268	Computer drawing (2)	3(1-6)
The course aims to introduce how to use advanced computer programs in drawing and outputting architectural projects in a three-dimensional manner and showing them using different materials and appropriate lighting in addition to introducing appropriate backgrounds. At the end of the course, the student will be able to produce an integrated architectural project by using the computer software techniques necessary to produce two-dimensional working drawings and three dimensional rendering		
Prerequisite: ARE 0267		
ARE 0281	Architectural design (1)	4(0-12)
Introduction to engineering economics principles, interest equations, making economic decisions using the present value method, future value, annual regular value, internal return ratio and cost-to-cost ratio, calculating the time required to recover capital, inflation.		
Prerequisite: ARE 0184		
ARE 0280	Architectural design (2)	4(0-12)
Introduction to engineering economics principles, interest equations, making economic decisions using the present value method, future value, annual regular value, internal return ratio and cost-to-cost ratio, calculating the time required to recover capital, inflation.		
Prerequisite: ARE 0281		
ARE 0223	Construction of buildings (1)	3(2-3)
The course aims to introduce the basic information for building construction, studying the various parts and parts of the building structure from foundations to roofs in terms of construction methods, as well as reviewing the main elements such as walls and roofs (vaults and sloping) and floors, in addition to explaining the properties of natural building materials: strength, cohesion. , Thermal conductivity, porosity, and basic building materials: stone, bricks, all kinds of cement, reinforced and regular concrete, wood, glass, plastic materials, and construction methods: site preparation, soil investigation, works, foundations and their types: continuous, shallow and deep (pegs), Bases, settlements, insulation, and structural construction: columns, bridges, concrete roof slabs, exterior and interior walls, stairs and elevators.		
Prerequisite: -		
ARE 0232	Construction of buildings (2)	3(2-3)
The course aims to study architectural finishes and fragments, cladding materials and their types in architectural construction, major finishes for ceilings, floors and main walls, kitchens, bathrooms, mangroves, iron, aluminum and plastic works (all kinds of windows and doors and their installation), various metal works in buildings, paints and their types, and construction on axes with dimensions of dimensions. Emphasis is placed on insulating materials (moisture, heat, and sound) and means of protection from various climatic factors.		



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Prerequisite: ARE 0223		
ARE 0215	History and Theories of Architecture (1)	3(3-0)
<p>The course presents the development of the art of architecture and construction across ancient civilizations: Pharaonic Egypt, Mesopotamia, Greco Roman, and also the focus is on architectural analyzes of models of famous historical buildings and the extrapolation of the distinctive architectural character of some historical architectural features and linking historical models with theories, employment conclusions in architectural design and presentation of opinions The theorists who had an impact in advancing the development of architecture. This course introduces the development of Islamic architecture since the early days of Islam, the architectural personality and the cultural heritage of the architecture of Islamic countries, the social, environmental and functional relationships that made architecture in the Islamic world the most suitable habitat for the Muslim human being with the study and analysis of Islamic historical and heritage building models for their compatibility and focus on theories Related.</p>		
Prerequisite: -		
ARE 0298	Survey principles for architecture students	2(1-3)
<p>Basic principles, distance measurement and correction, reference surfaces, angle and theodolite leveling and vertical adjustment devices, directions, angle measurement and correction, topographic surveying and contour lines, field lifting methods and techniques, measuring areas and volumes in engineering projects.</p>		
Prerequisite: -		
ARE 0381	Architectural design (3)	4(0-12)
<p>This course introduces the methods of integrated programming for an architectural project and how to achieve human needs and programming through designing specific projects (public buildings) and programs of medium complexity for them on sites of a medium structure nature, provided that these buildings contain jobs Different and multiple, whether in one building or a group of buildings, and the focus is on exploring architectural solutions through a systematic analysis and architectural translation of the design idea based on analytical conclusions at the different levels of the project, and also through understanding the kinetic patterns and functional relationships and dealing with the data of the social and psychological environment Behavioral and economical influencing architectural design.</p>		
Prerequisite: ARE 0280		
ARE 0380	Architectural design (4)	4(0-12)
<p>In this course, this course is introduced to how to deal with architectural heritage and architectural identity (Heritage and Identity) through the design of two projects, each consisting of a building or a group of buildings with advanced programs and on various topographic sites in composition. The first project focuses on the aesthetic, social and functional environment. And the architectural issue related to the heritage and the local Islamic Arab architectural identity, achieving clear harmony and harmony with the surrounding environment of the project, and the focus is on studying some of the designs and internal details of this project. As for the second project, the focus is on philosophical and intellectual trends, architectural currents, and the 9 architectural schools (Architectural Trends and Movements).</p>		
Prerequisite: ARE 0381		
ARE 0323	Behavior and the built environment	3(3-0)
<p>This course means defining the environment as a human behavioral content and the concepts of mental, spatial, emotional and social behavior, the concept of the unity of place and its association with behavior as a basis for designing human environments, and studying the concept of sensory and mental perception, its meanings, symbols, privacy, spatial control, safety, social interaction and its impact on the place, while conducting field studies and surveys to deepen this idea.</p>		
Prerequisite: ARE0232		
ARE 0334	Executive designs	3(1-6)
<p>This course introduces the preparation of drawings and executive designs for an integrated project and its detailed appendices, and the link between design and implementation, to produce it according to technical principles and take into account the professional requirements followed in Jordan and the requirements of the Jordanian building code.</p>		
Prerequisite: ARE0232		
ARE 0337	Construction Mechanics	3(3-0)
<p>This course specializes in understanding forces, compounds, torque, rigid and elastic body, and stability in two dimensions, types of anchors, free-body diagrams, types of structures, trusses and gantries, methods of finding internal forces in trusses, gantries, center of gravity, moment of inertia, compound spaces, axial stresses, Hooke's law, elastic modulus and stresses</p>		

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under the influence of different moments.		
Prerequisite: 030201101, 030202102		
ARE 0336	Introduction to structural design	3(3-0)
This course specializes in the structural characteristics of concrete, the distribution of adequate stress stress, the design of reinforced concrete sections to resist bending, the rectangular sections and the T- shaped sections, the design of one-way concrete slabs, the design of concrete columns for pivot works, the design of single concrete foundations, as well as the understanding of sections and standard steel connections and the design of parts Steel which are subjected to tensile and bending stresses and shear.		
Prerequisite: ARE 0337		
ARE 0368	Building modeling BIM	2(0-6)
This course builds on the knowledge and skills that students have accumulated in design, construction and architectural detailing To be applied in an integrated project on real land. A previously completed preliminary architectural design is being transformed Into a computerized system by the Building Information Modeling System (BIM) And its supporting programs (Rivet), so that the construction system to be used is approved in coordination with students Civil engineering, and raising it on the system, including topography, excavations, bases, columns, bridges and roofs And the exterior and interior surfaces and walls with its different layers, stairs, windows, doors, floors and insulation Finishes and furniture, in addition to all this, electromechanical systems in coordination with the students of these Majors. The course includes identifying the characteristics of quantities calculation, cost calculation and preparation of tables Relevant to follow up implementation.		
Prerequisite: ARE 0268		
ARE 0339	Sanitary, Heating, and air conditioning systems	3(3-0)
Basic definitions, materials used in sanitary installations in buildings, sanitary parts, their types and method of work, cold and hot water systems, sewage systems, rainwater drainage system, fire systems in buildings, drinking water, specifications, and treatment. This course presents the methods of heat transfer to and from buildings and the basic definitions related to HI. Identification of heating systems in buildings by water or hot air, as well as the methods of air exchange, ventilation and industrial air conditioning, types of devices used, insulation methods and materials used in buildings.		
Prerequisite: ARE0232		
ARE 0481	Architectural design (5)	4(0-12)
This course means advanced design of a complex building in terms of requirements, functions, relationships, and form, as well as providing basic services such as heating, cooling and acoustics, building construction and architecture and environmental physics, studying details and materials used in building the building and focusing on integration between technical and service systems and the ability to deal With these requirements based on the previous courses (Architectural Systems), one integrated project is designed during the semester.		
Prerequisite: ARE 0380		
ARE 0480	Architectural Design (6) (Urban Design)	4(0-12)
By making use of urban design theories, the student studies and designs a group of new interconnected buildings or the development of the group. Existing buildings consistent with the reality of the urban character. An urban environment of a special nature. This course covers methods of surveying, analysis and conclusion in studying a specific area, and the design process is sequenced from exploring problems and verifying their extent and then studying the factors associated with them in order to offer alternatives for various aspects in order to develop a comprehensive design concept. The course includes one major project during the semester.		
Prerequisite: ARE 0481		
ARE 0423	Urban design theories	3(3-0)
Familiarizing students with the theories of urban design, the methods used in visual analysis, understanding urban spaces, understanding the personality and the beacon of the place, and the social and economic effects on the morphological and typological formation (shape and pattern) of the city, studying social services and infrastructure in the city, devising planning standards and measuring the effectiveness of services from the reality of the study Field for an existing urban area.		
Prerequisite: ARE 0380		
ARE 0448	Site Coordination Engineering	3(2-3)
This course introduces the preparation of drawings and executive designs for an integrated project and its detailed appendices, and the link between design and implementation, to produce it according to technical principles and take into account the		



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<p>professional requirements followed in Jordan and the requirements of the Jordanian building code. This course is concerned with studying the human relationship with his environment through the ages with a focus on studying the Jordanian environment and its components of plants, as well as studying the principles, elements and theories of coordination, design, and planning of the site, in addition to understanding the influence of the environment on site coordination and design through the resulting spatial formation and its relationship to buildings and spaces And the elements, as well as the design idea of the site, the understanding of visual perception and the language of the place, it also reviews the methods and approaches of design and analysis related to the coordination of sites from the use of plants, water, rocks or the environment designed by humans as specialized design evidence. With a focus on implementation by proposing various projects that reflect local concepts and understanding the topic of site coordination as a task and allocating its requirements, procedures, methods of displaying it in drawings and others.</p>		
Prerequisite: ARE 0475		
ARE 0437	Lighting and acoustics	3(2-3)
<p>This course introduces the principles of natural and artificial lighting in buildings, studying the principles of acoustics and sound insulation, as well as introducing the physical properties of sound, its propagation and intensity, methods of measurement and identification of sound-absorbing materials, as well as the effect of lighting on architectural work, functional requirements and measurement of natural and industrial lighting, sources of industrial lighting, energy rationalization and recognition On measuring devices.</p>		
Prerequisite: ARE 0334		
ARE 0475	Provisions for construction and practice of the profession	3(3-0)
<p>This course examines the various aspects of practicing the profession of architecture, focusing on the engineering, union, legal and administrative professional aspects, and organizing the architect's relationship with the various individuals and institutions involved in the construction process, in addition to the duties and responsibilities of the architect, and provides an analysis of the various aspects of the relationship between the designer, the contractor and the customer. The focus is on the principles and ethics of the profession and a presentation of the importance of teamwork and the role of individual creativity in the development of the profession. The course also introduces the architectural aspects in terms of market requirements, supply, and demand for building legislation. Study laws, legislations, and building provisions in Jordanian cities and villages and the impact of their application on architectural design with a focus on relevant environmental, social, and economic data</p>		
Prerequisite: ARE 0334		
ARE 0521	Urban planning and housing	3(2-3)
<p>Study the factors on which the comprehensive planning process is based, the development of the city and its components as an organic, interconnected and integrated unit of functions, study of urban planning approaches and methods for reorganizing old areas and providing them with basic social and services, presenting housing theories in terms of design and planning, focusing on social, cultural, behavioral and environmental theories and the importance of the role Construction and financing Understanding and directing housing strategies and planning to provide housing for all segments of society with presenting local and international case studies and activating local field studies to deepen the concept of analyzing the cultural content of housing.</p>		
Prerequisite: ARE 0334		
ARE 0472	Field Training	3(3-0)
<p>The course focuses on training students in the field of architectural design, supervision and implementation in an engineering office or company, according to the instructions issued by the department council.</p>		
Prerequisite: Finishing 120 credit hours		
ARE 0583	Graduation Project (1)	2(2-0)
<p>Choosing an integrated architectural project and motivating students to deal with practical inputs in terms of testing the project and the topic (preferably proposed by a related party) and systematically preparing research and dealing with and integrated architectural programming for the final architectural project and choosing a site to establish the project (if not specified) And the preparation of the final study to include identifying objectives, needs, methodologies and contents, conducting analytical studies for the proposed site and studying comparative cases, in addition to proposing design principles, strategies and alternatives to reach a preliminary concept for preparing the final design.</p>		
Prerequisite: ARE 0480		
ARE 0584	Graduation Project (2)	6(6-0)



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<p>This course is preceded by the design of the project in which the research was prepared in the first phase, and the design includes a comprehensive analysis of the architectural idea and design philosophy, developing alternatives, evaluating them, adopting them and developing them based on the approach, idea and philosophy in which he communicates with the supervisor, as well as developing an integrated study of the internal and external space and linking design elements in the formation An integrated plastic and study of movement inside and outside the building so that the structural system and technical services are integrated with the integrated architectural and environmental design, while providing all the architectural drawings that express the design idea and the model of the project, and the course includes several external and internal arbitration stages.</p>		
Prerequisite: ARE 0583		
ARE 0535	Advanced construction systems	3(2-3)
<p>This course introduces the digital construction systems and their impact on the architectural void in terms of ideas, meanings, and integration in the production of buildings, as well as explaining the parts of modern structural structures through the study of surface and linear formations: bridge and column formations, various trusses (spatial and fondant and polygonal structures), and flat space structures, And box structures with vertical and horizontal slabs, curved shell shells (double and single bending), tension films and inflatable structures. As well as the development of the prefabricated building industry and methods of construction and roofing.</p>		
Prerequisite: ARE 0232		
ARE 0535	Special topics in architecture	3(3-0)
<p>A course related to various emerging topics in architecture. Maximum of (3) hours are counted for the graduation requirements of the two required department choices.</p>		
Prerequisite: As determined by the department council		
ARE 0589	Interior Design	3(2-3)
<p>This course examines the importance of designing the internal environment of buildings as a complementary basic element within the broader umbrella of architecture and the effect of interior design on user comfort. It also reviews the development of interior architecture theories and focuses on the importance of harmony in interior elements that include shape, color, texture, lighting, furniture, wall treatments, ceilings, and floors</p>		
Prerequisite: ARE 0280		
ARE 0550	Sustainable architecture	3(2-3)
<p>The course deals with renewable energy sources that can be used in buildings such as solar energy wind energy and geothermal and tidal and wave energy as sources. Available alternative energy in Jordan. Study different architectural treatments to increase the effectiveness of a lighting system, such as The use of optical fibers and ventilation in buildings such as air sheds .During a series of lectures on theory and practical experiments, he introduces building materials and architectural solutions that will reduce Of energy consumption in buildings</p>		
Prerequisite: ARE 0555		
ARE 0542	Management and preservation of heritage resources	3(3-0)
<p>The basic principles of the process of management and preservation of the architectural and cultural heritage in ancient cities, the processes of documenting field surveys, documentary photography, classification of buildings and techniques used in preservation processes, with the study of selected examples of the process of preserving architectural heritage from Jordan, the Arab world and foreign countries. The course includes an applied field study of the meanings Heritage and preservation.</p>		
Prerequisite: ARE 0315		
ARE 0429	Architectural criticism and analysis	3(3-0)
<p>This course is concerned with presenting and criticizing contemporary architecture theories and evaluating the ideological and philosophical principles, values and principles influencing and related to the contemporary architectural trend and contradictory goals and orientations, with the help of presenting with examples of the works of distinguished architects and the proposals of critical architects influencing contemporary architecture trends</p>		
Prerequisite: ARE0315		
ARE 0555	Environmental control	3(3-0)
<p>The study of renewable sources of energy (sun, wind, ... etc.) and ways to benefit from them in architectural design at the levels of architecture, environment, site coordination and urban planning, the course includes presenting models of</p>		



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contemporary designs that depend on natural sources of energy and natural architectural treatments systems to control an environment Buildings (heat, humidity, ventilation, lighting, ... etc.).		
		Prerequisite: ARE0339
ARE 0435	Geographic information systems and their application	3(2-3)
Characteristics and concepts of geographic information systems, spatial information management systems, design and implementation of geographic information systems and their role in digital maps, spatial information management, projections and coordinates, land information modeling, spatial representation (point system and grid system), coordinate processing, input and output operations, file storage, Database management systems and statistical distributions. Method of selecting the hardware and software needed for geographic information systems such as: (MicroStation / Geographic's, Geofeedia, ArcGIS) and how to use the main tools in the software, the coordinate system and projections, dealing with files, maps and tables of GIS, analyzing metadata. And spatial through various operations, producing maps, exercises and projects covering all topics of geographic information systems (MicroStation / Geographic's, Geofeedia, ArcGIS): Jy play		
		Prerequisite: ARE 0298