University OF MOSUL

First Cycle – Bachelor's Degree (B.Sc.) –
Architectural Engineering

بكالوريوس - هندسة العمارة

Table of Contents

1. Overview

This catalogue is about the courses (modules) given by the program of Architectural Engineering to gain the Bachelor of Science degree. The program delivers (57) Modules with (7500) total student workload hours and 300 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة العمارة للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (60) مادة دراسية مع (7500) إجمالي ساعات حمل الطالب و 300 إجمالي الوحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
ARC 111	Architecture Design and Graphic (1)	12	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	6	123	177
Description			
The studio introduces students to the field of design and its fundamental principles. The aim of the course is to expose students to basic design elements and principles and training them in design skills, including 2D drawing and model-making. Students have opportunities to create their own artwork and design products and learn through guided reflective activities individually as well as in groups. The course introduces the generic issues that influence and shape architecture and design, and aims at developing the skills to address them. The studio focuses on such elements as design method, representation, human scale, space, form, light, function, place and time. It provides understanding to the complex nature of space forming by synthesizing its basic elements; emphasis on constructive typology and form generation; formal expression and dependence/independence of mass and space using solid and void, ratio and proportions, and numerical logic.			

Module 2

Code	Course/Module Title	ECTS	Semester
ARC 112	Descriptive geometry & Engineering Drawing	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	3	63	87
Description			
Descriptive geometry deals with manually solving problems in three-dimensional geometry through working with two dimensional planes using these basic mechanical tools. This course is mainly about the techniques of solving three-dimensional geometry problems manually. The course starts off with a gentle introduction to some practical constructions just to get a sense of what one can accomplish using mechanical tools before going into details of orthographic projections and culminating in some useful applications. This course develops the ability of the students to understand geometric projection and learn the types of geometric projection. Students will learn how to use deferent drawing scales. The course develops the basic engineering drawing skills in one plane of the students and use drawing tools.			

Module 3

Code	Course/Module Title	ECTS	Semester
ARC 113	Art & Architecture	3	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	67
Description			
The subject is mostly theoretical. This course Concentrating on the different types of compositions which express design unity, Aesthetic judgment and taste tests, Analysis of mass and space, and also the principles of special organization, Analysis of constructional design and materials, Definition of architectural idea, style and creativity, presentation of the most important trends and movements in art and architecture with analysis of the works of pioneers**.**			

Module 4

Code	Course/Module Title	ECTS	Semester
ARC 114	Arabic Language	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2		32	18
Description			
This course aims to define students of the importance of Arabic in the university study by discussing a number of vocabulary and concepts used in university teaching within the bachelor's phase to raise awareness of the importance of using the correct language rules in writing reports and lectures.			

Module 5

Code	Course/Module Title	ECTS	Semester
ARC 115	Mathematics (1)	4	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	22
Description			
This course is a first course in a sequence of two covering the fundamental concepts of single variable calculus and their applications. Topics in this course are functions and graphing, limits and continuity, derivatives, derivative applications, integrals, applications of integration, and integration by substitution. Concepts of differential and integral calculus as applied to trigonometric, inverse trigonometric, and transcendental functions are included.			

Module 6

Code	Course/Module Title	ECTS	Semester
ARC 116	Democracy & Human Rights	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	32	18
Description			
Human rights in constitutional documents, human rights in international documents, human Rights in Islam and the political and social responsibility of the state in guaranteeing them. Positive civil and political rights Cultural, social and economic rights and safeguards to prevent human rights abuses. Definition of democracy, models of democracy, democratic systems and the nation government, the position of Islamic thought of democracy			

Module 7

Code	Course/Module Title	ECTS	Semester
ARC 121	Architecture Design and Graphic (2)	12	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	6	123	177
Description			
Theoretical part: Introduction, Primary Elements, Visual proportion of form, Primary shapes, Platonic solid, Regular and irregular forms, Transformation of form, Additive forms, Formal collisions of geometry, Articulation of form, Defining space with horizontal & vertical elements, Closure, Qualities of Architectural Space, Openings in space / Lighting, Spatial Relationships, Spatial Organizations, Circulation, Proportion and Scale, Practice/ Preliminary Presentation Ordering Principles, Practice/ Development			

Module 8

Code	Course/Module Title	ECTS	Semester
ARC 122	Free Hand Drawing (1)	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	3	63	62
Description			
This course provides practical training in the application of basic technical processes and manual skills to graphic designers, interior designers and architects. Students learn the basics of font, contour, shading, texture, perspective, composition and negative and positive negative design ratios. and movement. Students create many original works of art and collect a collection of their artwork			

Module 9

Code	Course/Module Title	ECTS	Semester
ARC 123	Construction and Building Materials	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1	48	52
Description			
This course introduces students to the basic building materials and systems used in constructing buildings, bridges, and infrastructure projects. It offers the basic understanding of the use of common systems such as foundations, structural framing/skeleton, building envelops, and finishes. Namely, it introduces students to proper terminology and usage of building materials and selected manufactured components.			

Module 10

Code	Course/Module Title	ECTS	Semester
ARC 124	computer literacy	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	42	75
Description			
The course aims to make students owing basic skills in IT(Word , Excel, Internet), Photoshop, AutoCAD			

Module 11

Code	Course/Module Title	ECTS	Semester
ARC 125	Mathematics (2)	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	22
Description			
Math 2 is the second course of a preparatory integrated math sequence. This course to meets the minimum graduation requirement. Geometric concepts from Math 1 are reinforced, with a stronger emphasis on proof, inductive reasoning, and their connection to algebra. The study of similarity leads to an understanding of right triangle trigonometry and connects to quadratics through Pythagorean relationships. The need for extending the set of rational numbers arises and real and complex numbers are introduced so that all quadratic equations can be solved. Circles, with their quadratic algebraic representations, round out the course. Students will be expected to work collaboratively, individually and demonstrate their learning through the Standards of Mathematical Practice. Students will be exposed to rich instruction that develop their conceptual understanding, procedural skill, problem solving skills, critical thinking abilities, and strengthen situational analysis abilities.			

Module 12

Code	Course/Module Title	ECTS	Semester
ARC 126	English – Beginners	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	32	18
Description			
This course is for Beginner English Course Level students who want to communicate in English, and develop basic speaking, reading, writing, and listening skills**.**			

Module 13

Code	Course/Module Title	ECTS	Semester
ARC 211	Architecture Design (1)	12	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	8	153	147
Description			
Theoretical part: Introduction, Primary Elements, Visual proportion of form, Primary shapes, Platonic solid, Regular and irregular forms, Transformation of form, Additive forms, Formal collisions of geometry, Articulation of form, Defining space with horizontal & vertical elements, Closure, Qualities of Architectural Space, Openings in space / Lighting, Spatial Relationships, Spatial Organizations, Circulation, Proportion and Scale, Practice/ Preliminary Presentation Ordering Principles, Practice/ Development			

Module 14

Code	Course/Module Title	ECTS	Semester
ARC 212	History of Ancient Architecture	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	67
Description			
The Course Deals with the evolution of architecture in Iraq in the ancient times and architecture in the Arab countries (Egypt and Syria) and neighboring countries (Asia Minor, Persia, Greece) and to clarify the effects of mutual design among them. The study will also clarify the relationship of the design concept of the buildings with the natural surroundings and cultural development within its period, and the relationship with the functional requirements and solutions to construction and environmental processors and integration with architectural form.			

Module 15

Code	Course/Module Title	ECTS	Semester
ARC 213	Building Construction	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	92
Description			
This course initially the basic principles of construction elements constituting architectural spaces and other associate systems common to construction. It introduces students to the various construction phases from concrete foundation to finishing. The course also includes a study of the design and implementation criteria relevant to construction of walls, ceilings, staircases, flooring, insulation and finishing material. Students will be provided with of practical application on vertical and horizontal installation models. (In bearing wall system)			

Module 16

Code	Course/Module Title	ECTS	Semester
ARC 214	Crimes of Ba'ath Regime in Iraq	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	32	18
Description			
This course aims to define the university student with crimes committed against the Iraqi people during that stage by showing and clarifying its details			

Module 17

Code	Course/Module Title	ECTS	Semester
ARC 215	Computer Architectural Drawing 2D	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	3	63	62
Description			
Introduction to Computer-Aided Drafting and Design which includes: 2D drawings, 3D modeling, rendering, and Image processing. Major CAD drafting, and presentation software tools will be used for the production, management, and presentation of project information. Introduction to utilization of modeling and simulation software tools in Architectural Engineering.			

Module 18

Code	Course/Module Title	ECTS	Semester
ARC 216	English – Pre Intermediate	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
This course is for Pre-Intermediate level students who want to communicate in English, and develop advanced speaking, reading, writing paragraphs, and listening skills**.**			

Module 19

Code	Course/Module Title	ECTS	Semester
ARC 221	Architecture Design (2)	12	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	8	153	147
Description			
Theoretical part: Introduction, Primary Elements, Visual proportion of form, Primary shapes, Platonic solid, Regular and irregular forms, Transformation of form, Additive forms, Formal collisions of geometry, Articulation of form, Defining space with horizontal & vertical elements, Closure, Qualities of Architectural Space, Openings in space / Lighting, Spatial Relationships, Spatial Organizations, Circulation, Proportion and Scale, Practice/ Preliminary Presentation Ordering Principles, Practice/ Development			

Module 20

Code	Course/Module Title	ECTS	Semester
ARC 222	Free Hand Drawing (2)	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
0	4	63	37
Description			
Students will draw more complex models, and learn new techniques in shading and using colours. Also we will focus on drawing building and landscape for developing and communicating ideas in the design process. Developing students freehand drawing skills, as a tool to express their ideas in an appropriate way to complete what they had received in the first stage in the same subject, with a particular focusing on the architectural drawings with three-dimensional(3D) perspective (internal and external). The subject also aims to develop the students' skills using different means in freehand drawing with a focus on visualization techniques coloured pencil, ink pens, water colours, and other techniques.			

Module 21

Code	Course/Module Title	ECTS	Semester
ARC 223	History of European Architecture	3	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
Inform students about the development of European Architecture from pre-Roman age until Renaissance and Baroque. Enhance the concept of architectural interactions between European civilizations and others, especially with Arabic-Islamic civilizations. Analyzing historical examples according to architectural theories of Design. Free-hand architectural drawings analysis			

Module 22

Code	Course/Module Title	ECTS	Semester
ARC 224	Physics	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	63	37

Description

The module aims for the curriculum on Architectural Physics (1) are as follows:
1. To provide students with a comprehensive understanding of the relationship between architecture and climate.
2. To introduce students to the principles and strategies of climate-responsive design in architecture.
3. To explore the fundamental concepts of climate analysis and its influence on architectural design decisions.
4. To develop students' knowledge and skills in utilizing passive design strategies for energy efficiency and thermal comfort.
5. To familiarize students with sustainable technologies and practices related to renewable energy, wate efficiency, and green infrastructure.
6. To examine the impact of climate change on the built environment and equip students with resilient design strategies.
7. To foster critical thinking and problem-solving abilities in addressing climate challenges through architectural design.
8. To encourage students to analyze and evaluate case studies of climate-conscious architectural projects.
9. To inspire students to explore future trends and innovations in sustainable architecture and climate-responsive design.
10. To promote interdisciplinary collaboration and an understanding of the role of architecture in creating climate-friendly cities.
These module aims aim to provide students with a strong foundation in the principles, techniques, and considerations related to architecture and climate, enabling them to design buildings that are responsive to their climatic conditions and contribute to environmental sustainability.

Module 23

Code	Course/Module Title	ECTS	Semester
ARC 225	Computer Architectural Drawing 3D	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	2	48	52
Description			
To provide specialized information in the field of graphic computer software related to engineering and architectural drawings, especially the AutoCAD software. 2. enabling the user to use the commands gradually, according to the degree of importance of the order, its level of complexity, and the user's need for it according to the level of his capabilities and his ability of dealing with the details, orders and elements of the software.			

Module 24

Code	Course/Module Title	ECTS	Semester
ARC 226	Science of Mechanics	3	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
This course initially the basic principles of construction elements constituting architectural spaces and other associate systems common to construction. It introduces students to the various construction phases from concrete foundation to finishing. The course also includes a study of the design and implementation criteria relevant to construction of walls, ceilings, staircases, flooring, insulation and finishing material. Students will be provided with of practical application on vertical and horizontal installation models. (In bearing wall system).			

Module 25

Code	Course/Module Title	ECTS	Semester
ARC 311	Architecture Design (3)	12	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	8	154	146
Description			
Design of a Multi-Family Housing Complex in Mosul City. The course initially introduces the basics of architectural design for a multi-family multi-story housing complex. To make students of architecture familiar with principles and concepts of planning taking into consideration the importance of planning process and the role of architect within this process. Students should be able to deal with urban planning process and its elements including street and parking design and master plans besides introducing many world-wide experiments within this subject. Systematic introduction to issues related with the design of human habitat, its components and space standards. The objective of the studio will be on understanding residential spaces in both the urban and traditional contexts. To train students for undertaking design of multi-story buildings, frame structure, considering site planning, structures, services, etc. Study architecture prevalent in Iraq (Mosul city) and its local character and characteristic elements of design. Responsiveness: Welcoming, open and inclusive, integrated and harmonious, visually connected with, and open to, its immediate surroundings, responsive to the site, the wider context, the social needs of the families and whole community.			

Module 26

Code	Course/Module Title	ECTS	Semester
ARC 312	Working Drawings (1)	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	4	78	47
Description			
Educate the student how design the working drawing sheet, educate other related construction systems by theoretical and practical studying (exercises and field visits), so the student should be able to work, read the working and architectural drawings and learn the technical details of their own.			

Module 27

Code	Course/Module Title	ECTS	Semester
ARC 313	Computer Rendering Techniques	4	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	2	48	52
Description			
The course is concerned with applying the latest techniques used in computer aided architectural presentation by learning about drawing and rendering techniques by using 3d Max and Corona render software to reach a computer aided architectural presentation that is as close to realism as possible. In addition to getting acquainted with the most important techniques to assist in architectural presentation through the use of Adobe Photoshop software. The course develops students' design skills and creative thinking through design and formal alternatives that students learn about during work, as well as the architectural presentation of various projects and in various environmental conditions.			

Module 28

Code	Course/Module Title	ECTS	Semester
ARC 314	Principles of Housing	3	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
Definitions & Discussion of Housing Need, Human Demand, Housings Standards & types. Definitions & Discussion of Components of Residential urban fabric with their Comprehensive View & philosophy. As a requirement, student should present a report about one of main housing topics during the course.			

Module 29

Code	Course/Module Title	ECTS	Semester
ARC 315	Reinforced Concrete Designing	4	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	67
Description			
Analysis and Design of rectangular beams subjected to flexural bending and Shear design for beams moreover, Design and analysis of Short Columns Subject to Axial Load and Bending.			

Module 30

Code	Course/Module Title	ECTS	Semester
ARC 316	English - Intermediate	2	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
This course is for Intermediate level students who want to communicate in English, and develop advanced speaking, reading, writing paragraphs, and listening skills**.**			

Module 31

Code	Course/Module Title	ECTS	Semester
ARC 321	Architecture Design (4)	12	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	8	154	146
Description			
This course, in the design studio sequence, continues the development of a comprehensive building design process with problems of complex scope. The studio focuses on building types that exhibit complexity and challenge such as hospital. Hospital project explored in this studio includes the synthesis of spatial, functional, and contextual concerns, as directly linked to the understanding and employment of building systems. In addition, emphasis is placed on building envelope in terms of form, massing, articulation and fenestration. The use of computer-aided design is a part of the design exploration. In the design studio sequence, continues the development of a comprehensive building design process with problems of complex scope. The studio focuses on building types that exhibit			

complexity and challenge such as university academic buildings. Project of university college explored in this studio includes the synthesis of spatial, functional, and contextual concerns, as directly linked to the understanding and employment of building systems. In addition, emphasis is placed on building envelope in terms of form, massing, articulation and fenestration. The use of computer-aided design is a part of the design exploration.

Module 32

Code	Course/Module Title	ECTS	Semester
ARC 322	Survey and Architectural Documentation	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
Architectural documentation is a scientific course with theoretical and practical parts, concerned with providing and analyzing information specialized in the field of urban conservation, especially the techniques and technologies of architectural documentation of historical buildings and the built environment. The semester establishes for fundamental base for the conservation and documentation processes, and provides the ability to use different techniques and tools for this purpose.			

Module 33

Code	Course/Module Title	ECTS	Semester
ARC 323	Islamic Architecture	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
The Islamic architecture course is concerned with the study of characteristics of Islamic architecture followed by clarifying the basic functional patterns of Islamic Architectural buildings such as religious (Mosqu, Madrasa) and the service buildings such sa (Markets, baths, and Bimaristan), and the residential buildings which include the traditional Islamic house and the palaces of the rulers), and finally the Sufism buildings (Khanaqah, Rabat, Tikkia) and some other buildings such as the Shrine and the Sabil and the architecture of Islamic bridges.			

Module 34

Code	Course/Module Title	ECTS	Semester
ARC 324	Engineering Services (1)	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
The course is parted into five sections. Each section addresses a certain part of plumbing. The first section lunges the scope of plumbing and plumbing equipment. The second section subjects water supply system. Water supply is the provision of water by public utilities commercial organizations, community endeavors or by individuals, usually via a system of pumps and pipes. A water supply system: Water storage facilities such as reservoirs, water tanks, or water towers. Smaller water systems may store the water in cisterns or pressure vessels. Tall buildings may also need to store water locally in pressure vessels in order for the water to reach the upper floors. A pipe network for distribution of water to the consumers, which may be private houses, and other usage points. The third section addresses the types of plumbing pipes. Plumbing uses different types of pipes. Each type of pipes has essential usage according to its specific characteristics. Besides, plumbing uses types of valves, tanks, and other apparatuses to convey fluids. The fourth section explains sewage or domestic wastewater. Connections to the sewers, underground pipes, are generally found downstream of the water consumers, but the sewer system is considered to be a separate system, rather than part of the water supply system. Sanitary sewer is an underground carriage system specifically for transporting sewage from house through pipes to treatment facilities or disposal. Sanitary sewers are part of an overall system called a sewage system or sewerage. Separate sanitary sewer systems are designed to transport sewage alone.			

Module 35

Code	Course/Module Title	ECTS	Semester
ARC 325	Working Drawings (2)	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	4	78	47
Description			
Introducing iron designs and how to deal with Steel sections of various types and shapes, in addition to teaching students how to form and shape Steel structures with relatively large areas and dealing with details related to the details, as well as identifying the features of different architectural spaces designed from Steel sections.			

Module 36

Code	Course/Module Title	ECTS	Semester
ARC 326	Principles of Planning	4	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	67
Description			
The course initially introduces the principles of planning concerning on urban planning as the level that most connected to architecture with focusing on site elements and evolution of human settlements.			

Module 37

Code	Course/Module Title	ECTS	Semester
ARC 411	Architecture Design (5)	12	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	8	154	146
Description			
This course, in the design studio sequence, continues the development of a comprehensive building design process with problems of complex scope. The studio focuses on building types that exhibit complexity and challenge such as hospital. Hospital project explored in this studio includes the synthesis of spatial, functional, and contextual concerns, as directly linked to the understanding and employment of building systems. The course emphasis is placed on a building envelope in terms of form, massing, articulation and fenestration. The use of computer-aided drafting is a part of the formal design exploration.			

Module 38

Code	Course/Module Title	ECTS	Semester
ARC 412	Interior Design	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	5	78	72
Description			
Design studio allows students to create creative interiors with spatial qualities that are habitable for people on all levels of experience: aesthetically, functionally, and psychologically. With comfort and efficiency Interior, architecture study of the relationships within the building enclosures; architectural planes, aspects of layout, furnishing, vertical and horizontal circulation among interior spaces, properties of interior materials, space lighting and acoustics.			

Module 39

Code	Course/Module Title	ECTS	Semester
ARC 413	Theories of Architecture	3	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
The course includes a presentation of the theoretical framework of the main architectural movements and their secondary sub-divosions over their change within the nineteenth and twentieth centuries, to contemporary architecture today. This framework includes the presentation of the thought of modernist architecture from its beginnings and development, with its changes according to the regions and architects who practiced it, as well as the architecture of late modernity, postmodern architecture and deconstructive architecture. Classification of the important aspects of each of the architectural movements which distinguishes them from others. Clarify the theoretical aspect of each architectural movement by enhancing it with examples.			

Module 40

Code	Course/Module Title	ECTS	Semester
ARC 414	Steel Design	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	63	37
Description			
This course is a critical analysis of the theories and current issues of urban spatial design. It examines city forms and urban patterns. It emphasis on the understanding of the physical, socio- cultural, and technological forces, and their role in shaping the urban environment. It aims to deal with the urban space concept, space- mass relation, functions of urban space, the space body, and how to design the urbane space as a main feature in the urban fabric of the city.			

Module 41

Code	Course/Module Title	ECTS	Semester
ARC 415	Advanced Building Techniques	3	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
This course is a critical analysis of the theories and current issues of urban spatial design. It examines city forms and urban patterns. It emphasis on the understanding of the physical, socio- cultural, and technological forces, and their role in shaping the urban environment. It aims to deal with the urban space concept, space- mass relation, functions of urban space, the space body, and how to design the urbane space as a main feature in the urban fabric of the city.			

Module 42

Code	Course/Module Title	ECTS	Semester
ARC 416	English - Upper Intermediate	2	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	**0**	33	17
Description			
This course is for upper Intermediate level students who want to communicate in English, and develop advanced speaking, reading, writing paragraphs, and listening skills**.**			

Module 43

Code	Course/Module Title	ECTS	Semester
ARC 421	Architecture Design (6)	12	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	8	154	146
Description			
This course, in the design studio sequence, continues the development of a comprehensive building design process with problems of complex scope. The studio focuses on building types that exhibit complexity and challenge such as educational buildings. College project explored in this studio includes the synthesis of spatial, functional, and contextual concerns, as directly linked to the understanding and employment of building systems. The course emphasis is placed on a building envelope in terms of form, massing, articulation and fenestration. The use of computer-aided drafting is a part of the formal design exploration.			

Module 44

Code	Course/Module Title	ECTS	Semester
ARC 422	Regional Contemporary Architecture	3	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
An article Theory two hours a week dealing with two axes; first the theory and directions of contemporary architecture in Iraq and regional countries and reality of urbanization in the regional countries and its identity, and intellectual and philosophical architects ideas of contemporary Arab architecture and Axis II of the application and architecture examples.			

Module 45

Code	Course/Module Title	ECTS	Semester
ARC 423	Theories of Urban Design	3	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
This course is concerned with the study of the basic principles of urban design by discussing and analyzing theories			

Module 46

Code	Course/Module Title	ECTS	Semester
ARC 424	Architectural Physics (2)	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	63	37
Description			
The module aims for the curriculum on architectural acoustics can be summarized as follows:			

1. To develop a comprehensive understanding of the field of architectural acoustics, including its significance in architectural design and its historical context.
2. To provide a solid foundation in the fundamental principles of sound and acoustics, including the properties of sound waves, human perception of sound, and key acoustical metrics.
3. To explore the various aspects of room acoustics, including sound reflection, diffusion, absorption, ar the influence of room geometry on sound quality.
4. To examine the principles and techniques of sound transmission and insulation in buildings, including strategies for controlling noise between different spaces.
5. To understand the factors influencing speech intelligibility and to learn how to design spaces that optimize speech clarity and minimize background noise.
6. To explore the specific acoustical requirements and design considerations for specialized spaces such as auditoriums, concert halls, recording studios, cinemas, and home theaters.
7. To introduce the principles of sound reinforcement systems, including the basics of microphones, loudspeakers, and signal processing, and their application in public address systems and auditoriums.
8. To examine the impact of environmental noise and explore techniques for mitigating noise in architectural design.
9. To understand the role of HVAC systems in acoustics and to learn about noise control measures, design guidelines, and sound masking techniques for improving acoustic comfort in buildings.
10. To explore the acoustic requirements and design considerations for recording studios, including sound isolation, room treatments, and achieving desired sound characteristics.
11. To introduce sustainable acoustics and explore the integration of acoustics into sustainable design practices, including the selection of environmentally friendly acoustical materials and achieving acoustic performance in green buildings.
12. To analyze case studies of iconic architectural acoustics projects and understand current research trends and emerging technologies in the field.
13. To encourage further study and specialization in architectural acoustics and provide opportunities fo students to pursue research and innovation in the field.
The module aims to equip students with the knowledge, skills, and critical thinking necessary to understand and apply the principles of architectural acoustics in their future professional practice. It aims to foster an appreciation for the impact of acoustics on human well-being and to instill a desire for continuous learning and exploration in the field of architectural acoustics.

Module 47

Code	Course/Module Title	ECTS	Semester
ARC 425	Landscape Design	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	4	78	47
Description			
Comprehensive application of landscape design skills. Design studio allow students to apply theories and principles of landscape architecture to their own projects. These projects are developed according to certain scale requirements cover areas such as urban open spaces. Introducing theories, principles and examples of contemporary landscape architecture with emphasis on landscapes for hot arid environments; site analysis and landscape evaluation, site design, theory, process, materials, features and design elements; appropriate plant materials, structures, pavements and street furniture, grading, drainage and irrigation			

Module 48

Code	Course/Module Title	ECTS	Semester
ARC 426	Design Methodology and Programing	3	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
Increasing methodological knowledge for students to planning design process according to scientific and recent methods, with analytical application for real projects to discover its goals and positions of computer application.			

Module 49

Code	Course/Module Title	ECTS	Semester
ARC 511	Thesis of Architecture Design	6	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	6	122	28
Description			
Increasing methodological knowledge for students to planning design process according to scientific and recent methods, with analytical application for real projects to discover its goals and positions of computer application.			

Module 50

Code	Course/Module Title	ECTS	Semester
ARC 512	Architectural Conservation	3	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
Increasing methodological knowledge for students to planning design process according to scientific and recent methods, with analytical application for real projects to discover its goals and positions of computer application.			

Module 51

Code	Course/Module Title	ECTS	Semester
ARC 513	Estimation and specification	3	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
This subject covers the various aspects of estimating of quantities of items of works involved in buildings. This also covers the rate analysis, valuation of properties and preparation of reports for estimation of various items. At the end of this course the student shall be able to estimate the material quantities, prepare a bill of quantities, make specifications and prepare tender documents. Student should also be able to prepare value estimates.			

Module 52

Code	Course/Module Title	ECTS	Semester
ARC 514	Computer Aided Design Methods	3	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
Increasing methodological knowledge for students to planning design process according to scientific and recent methods, with analytical application for real projects to discover its goals and positions of computer application.			

Module 53

Code	Course/Module Title	ECTS	Semester
ARC 515	Urban Design	12	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	8	154	146
Description			
The course is Focused on the solution of urban spatial problems and urban rehabilitation. Examination of case studies is undertaken at the scale of a district within the city. Action area projects are chosen from adjacent urban areas to allow easy accessibility for data collection and actual site analysis.			

Module 54

Code	Course/Module Title	ECTS	Semester
ARC 516	Engineering Services (2)	3	9
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
1. This course aims to introduce architecture students to the most significant knowledge in all engineering services, in order to make them more aware and understand what happens during the design process 2. Give architecture students sufficient experience to provide adequate spaces and access to the necessary building engineering systems and equipment during the early stages of the building design process.			

Module 55

Code	Course/Module Title	ECTS	Semester
ARC 521	Graduation Project	14	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	8	152	198
Description			
This studio begins with a presentation of the ARC-400 program document with clear indication of the intent and direction of emphasis. Having been reviewed and approved by a senior project committee, this project design is undertaken to its completion. The project must exhibit a comprehensive mastery of architectural design, reflecting the knowledge and skills acquired during four years of study in architecture. It aims to develop student's ability to conduct with the building and dealing with the design problems.			

Module 56

Code	Course/Module Title	ECTS	Semester
ARC 522	Ethics and Proffecinal Practice	3	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
The course presents an overview contemporary context and complexities of architectural practice and the varied and evolving roles and responsibilities of the architect with an emphasis on the characteristics of best practices. the course focuses on architects, clients, and society, developing an understanding of professionalism through an examination of the development of the profession; educational preparation; internship; laws pertaining to registration; client relationships; ethics and professional judgment, diversity issues in practice; organizational and management issues including firm formation, legal organization, firm structure.			

Module 57

Code	Course/Module Title	ECTS	Semester
ARC 523	Physics Laboratory	4	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	4	78	22

Description

Module Aims for the curriculum on using computers to study the behavior of air and fluid dynamics in the field of architecture:
1. Provide students with a comprehensive understanding of the application of Computational Fluid Dynamics (CFD) in architectural design and analysis.
2. Familiarize students with the principles and fundamentals of fluid mechanics and their relevance to architectural systems.
3. Develop students' proficiency in using CFD software to model and simulate airflow, thermal condition and other fluid dynamics phenomena in architectural environments.
4. Enable students to evaluate and optimize architectural designs based on their understanding of air ar fluid dynamics.
5. Enhance students' ability to analyze and interpret simulation results to inform design decisions and improve building performance.
6. Cultivate students' critical thinking and problem-solving skills by engaging them in practical exercises and projects that apply CFD techniques to real-world architectural scenarios.
7. Foster collaboration and communication skills through group discussions, project presentations, and case study analysis.
8. Encourage students to critically assess the limitations and uncertainties associated with CFD simulations and recognize the importance of validation and verification.
9. Stimulate students' awareness of emerging trends and advancements in the field of CFD and its potential impact on architectural design and sustainability.
10. Promote an interdisciplinary approach by connecting fluid dynamics principles with other relevant aspects of architecture, such as thermal comfort, energy efficiency, and environmental performance.
Overall, the module aims to equip students with the necessary knowledge, skills, and mindset to effectively utilize CFD software for studying and optimizing the behavior of air and fluid dynamics in architectural contexts.

Module 58

Code	Course/Module Title	ECTS	Semester
ARC 524	Projects Management	3	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			
Project Management focuses on the management and implementation of construction projects, primarily infrastructure projects. A project refers to a temporary piece of work undertaken to create a unique product or service. Whereas operations are continuous and repeating, projects are finite and have an end date. Projects bring form or function to ideas or need. Some notable projects include the Manhattan Project (developing the first nuclear weapon); the Human Genome Project (mapping the human genome); and the Central Artery Project (Boston's "Big Dig"). The field of project management deals with the planning, execution, and controlling of projects.			

Module 59

Code	Course/Module Title	ECTS	Semester
ARC 525	Sustainable Architecture	2	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
This course is concerned with the study of the basic principles of sustainable design and sustainable architecture			

Module 60

Code	Course/Module Title	ECTS	Semester
ARC 526	Science of Statistics	4	10
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	63	37
Description			
Basic probability and statistics with applications and examples in engineering. Elementary probability, random variables and their distribution, random processes, statistical inference, linear regression, correlation and basic design of experiments with application to quality assurance, reliability, and life testing			

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