

University of Samarra



First Cycle – bachelor's degree (B.Sc.) Architectural Engineering



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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 (59) Modules with (7500) total student workload hours and 300 total ECTS. The module delivery is based on the Bologna Process.

1. Undergraduate Courses 2024-2025

- FIRST YEAR

Module 1

Code	Course/Module Title	ECTS	Semester
AE1101	Architectural Design I	8	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	6	120	80
Description			
<p>The course prepares the student to enter the world of architecture intellectually, conceptually, and practically as a fundamental work base. It introduces the concept of architecture by familiarizing the student with the principles of design, composition, the third dimension, architectural space, human scale, and the surrounding urban environment, among others. It also aims to develop the student's ability to express these concepts and more. The course focuses on enhancing the student's artistic and compositional sense, analytical and synthetic thinking patterns, as well as developing their awareness and sensitivity to both the natural and built environments, and fostering respect for them. This begins with understanding and appreciating the traditional urban environment and studying the compositional, formative, and expressive relationships of its elements and components.</p>			

Module 2

Code	Course/Module Title	ECTS	Semester
AE1102	Architectural Drawing I	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	3	78	47
Description			
<p>Architectural drawing is one of the most important means of expressing the architect's design ideas. Therefore, the course aims to build and develop the student's expressive skills, in addition to training them in using various materials and techniques for presentation. The course focuses on the gradual development of the student's skills through a clear sequence of exercises, starting with exercises on line values and progressing to two-dimensional drawings (Plans, Sections, and Elevations).</p>			

Module 3

Code	Course/Module Title	ECTS	Semester
AE1103	Free Hand I	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	3	78	47
Description			
<p>The course introduces students to essential techniques in freehand drawing and design, including pencils, ink pens, colored pencils, watercolor, poster colors, and oil paints. It focuses on developing skills in selecting shapes and colors, perceiving details, and understanding proportions, movement, and light. Successful students must present up to ten artworks, including documentation of heritage buildings and monuments. Optional assignments include replicating artworks, designing posters, and learning clay sculpting and ceramic techniques.</p>			

Module 4

Code	Course/Module Title	ECTS	Semester
AE1104	Principles of Art and Architecture	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
4	0	63	37
Description			
The course aims to develop analytical and critical abilities by establishing the necessary principles and enhancing the study of concepts such as space, mass, and form from multiple perspectives. It also introduces key critical theories that view architecture as a hybrid product of science and art, deepening the student's awareness of design elements such as line, direction, color, texture, etc.			

Module 5

Code	Course/Module Title	ECTS	Semester
AE1105	Mathematics	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	2	63	37
Description			
It is to provide the student with a general understanding of mathematics as fundamental principles for an engineering student, along with some engineering applications that will benefit architecture students in their advanced stages.			

Module6

Code	Course/Module Title	ECTS	Semester
UOS-1102	Arabic I	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0	33	17
Description			
This course aims to develop Arabic language skills for engineering students, with a focus on the basic rules of grammar and morphology, as well as academic and technical writing styles. Topics include improving written and oral expression skills, writing technical reports and official correspondence, and becoming familiar with engineering terminology in Arabic. The course also aims to enhance the ability for linguistic analysis and effective communication in professional and academic contexts.			

Module7

Code	Course/Module Title	ECTS	Semester
UOS-12012	Human rights, freedom and democracy	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0	33	17
Description			
<p>This course aims to introduce students to the concepts of democracy and human rights, and their importance in building modern societies. It covers the fundamental principles of democracy, such as the rule of law, political participation, and freedom of expression, in addition to studying the basic rights and freedoms outlined in international charters. The course also highlights the role of institutions in protecting human rights and the challenges faced in implementing these principles across different societies.</p>			

Module 8

Code	Course/Module Title	ECTS	Semester
AE1201	Architectural Design II	8	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	6	120	80
Description			
<p>The course prepares the student to enter the world of architecture intellectually, conceptually, and practically as a fundamental work basis. It introduces them to the concept of architecture through understanding the principles of design, composition, the third dimension, architectural space, human scale, and the urban environmental context, among others. It also aims to develop the student's ability to express these concepts and more. The course focuses on enhancing the student's artistic and compositional sense, analytical and synthetic thinking patterns, as well as fostering their awareness and sensitivity to the natural and built environment and respecting it. This begins with an understanding and appreciation of the traditional urban environment and the study of the compositional, formative, and expressive relationships between its elements and components.</p>			

Module 9

Code	Course/Module Title	ECTS	Semester
AE1202	Architectural Drawing II	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	3	78	47
Description			
<p>Architectural drawing is one of the most important means of expressing the architect's design ideas. Therefore, the course aims to build and develop the student's expressive skills, in addition to training them in using various materials and techniques for presentation. The subject focuses on the gradual development of the student's skills through a clear sequence of exercises, starting from exercises on line values and leading to two-dimensional drawings (Plans, Sections, and Elevations). In the second half of the second semester, the course introduces the basic principles of three-dimensional drawings, particularly axonometric and isometric drawing techniques. As for presentation, the focus in</p>			

the first year is on rendering techniques using pencil, collage, colored pencils, ink, and basic principles of poster and watercolor rendering, in addition to developing the skill of creating architectural

Module 10

Code	Course/Module Title	ECTS	Semester
AE1203	Free hand II	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	3	78	47
Description			
<p>The student is introduced to the essential techniques used in freehand drawing and the design process, including pencils, ink pens, colored pencils, watercolor, poster colors, and oil paints.</p> <p>Course Objectives:</p> <ol style="list-style-type: none"> 1. Developing the student's ability to select appropriate compositions and colors and to develop a sense of aesthetics. 2. Training the student's eye to perceive fine details in the physical world, as well as understanding proportions, movement, shadow, light, and color. 3. Enabling the student to grasp the visual vocabulary needed for other courses, such as design and architectural drawing. 4. A successful student advancing to the second year must present no more than ten artworks during the summer break, including: <ul style="list-style-type: none"> • Documentation of heritage buildings using pencil, ink, or colored pencils. • Documentation of memorial monuments in Samarra and other provinces. • Replicated drawings of Iraqi and international buildings. <p>Optional Drawing / Additional Materials:</p> <p>Students can enroll in this course voluntarily at any academic stage. The course focuses on:</p> <ol style="list-style-type: none"> 1. Additional assignments covering various subjects drawn by the student. 2. Replicating international, Arab, and local paintings using different techniques. 3. Designing posters and greeting cards for various occasions. 4. Training students interested in learning clay sculpting and ceramic techniques . 			

Module 11

Code	Course/Module Title	ECTS	Semester
AE1204	Building Construction, I	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
1	3	63	37
Description			
<p>The Building Construction I course aims to introduce first-year architecture students to various building materials used both locally and globally, with a particular focus on local construction materials and the related construction techniques, including the connection and assembly of materials.</p>			

Module 12

Code	Course/Module Title	ECTS	Semester
AE1205	History of Architecture I	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	0	48	27
Description			
<p>This course focuses on studying the evolution of architecture throughout the ages, from ancient civilizations to modern architecture. It covers major architectural styles, materials, and techniques used, as well as the cultural and social influences that have shaped architecture across different historical periods. The course also aims to analyze prominent architectural models and understand the relationship between architecture, the environment, and society, helping students draw design inspiration from the global architectural heritage.</p>			

Module 13

Code	Course/Module Title	ECTS	Semester
UOS-12011	English Language I	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0	33	17
Description			
<p>The course aims to develop the student's ability to use the language in pronunciation, conversation, and writing principles. In high school, students were introduced to a wide range of English grammar rules, pronunciation basics, and reading skills. However, they did not have enough opportunities to develop other language skills, which can only be enriched through practice and training. Therefore, the course focuses on reading aloud, practicing new vocabulary, understanding spelling and pronunciation rules, and mastering the fundamentals of writing through short paragraph compositions. To relate the subject to architectural studies, special emphasis is placed on reading and writing architecture-related topics. The course also trains students to correctly handle architectural terminology and recognize it in architectural texts, helping them avoid the common mistake of direct translation, which often diminishes the literary, intellectual, and conceptual value of the texts.</p>			

Module 14

Code	Course/Module Title	ECTS	Semester
UOS-1101	COMPUTER, I	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
1	2	48	27
Description			
<p>Providing the student with a general idea about computer science and its various office applications as fundamental principles for an engineering student, along with the addition of some engineering applications that are beneficial for an architecture student in advanced stages.</p>			

SECOND YEAR

Module 15

Code	Course/Module Title	ECTS	Semester
AE211	Architectural Design III	10	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	8	150	100
Description			
<p>A course of studio based practical architectural design work which aims to: widen perception of architecture; introduce issues of cultural and technological significance; generate the interpretation and solution of a series of wide-ranging design problems. The module introduces students to the main communication skills used in architecture, including spoken presentation, listening, various graphical techniques, model-making and information technology. The model of architectural education which focuses primarily around the design studio, is supported by lectures, seminars, field trips and workshops . The students will be assessed through both group and individual coursework, which may include design portfolios, written reports or presentations. Feedback will be given via individual and group tutorials and studio-based design reviews . The technical aspects of the work aim to: develop an understanding of the way building structure, construction and services inform, interpret and contribute to the architectural design process; and provide the opportunity for the demonstration of that understanding as an essential component of practical architectural design</p>			

Module 16

Code	Course/Module Title	ECTS	Semester
AE212	Architectural Presentation	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	4	75	75
Description			
<p>The lesson of architectural drawing and rendering bears the greatest responsibility in defining and enabling the student to produce and display his final project in a manner appropriate to the idea and design scheme, so the lesson of rendering techniques represents two interconnected parts of the techniques starting with architectural drawing and ending with architectural rendering techniques. Therefore, the lesson aims to develop students' knowledge of the basics and skills of measured two- and three-dimensional architectural drawings, introduce students to how to employ these measured graphics and use them as a means to express their design ideas by showing them in the form of three-dimensional graphics that convey and express their ideas. Developing students' skills in various architectural directing methods using (pencils, wooden pens, ink pens, watercolors and posters, texture and pantone colors, collage / etc.), this will teach the student how to choose the appropriate means in the architectural rendering process and by using the rendering process as an expressive tool in an architectural language that conveys the idea of design production. And finally, the lesson contributes greatly to the process of expanding the imaginary horizon prior to students' ideas, and thus the ease of conveying these ideas by choosing an appropriate method of presentation.</p>			

Module 17

Code	Course/Module Title	ECTS	Semester
AE213	Structure I	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	0	63	37
Description			
<p>The Structure I module is an introduction to learning and applying the principles of structural analysis and design. Concepts will be applied in this module based on the previous students' knowledge of basic math and physics. The course addresses the modeling and analysis of static equilibrium problems with an emphasis on real-world engineering applications and basic designs. The module begins with an understanding of the basic theoretical issues, where concepts such as vectors, forces, a moment of force, bending moments, shear forces, longitudinal forces, etc. The module includes an introduction to forces, the 2D equilibrium of particles and rigid bodies, the center of gravity and centroids, distributed loading, the analysis of truss structures, bending theory, and shear force and bending moment diagrams. The module will also deal with calculating the different types of internal stresses (normal and shear) and related deformations that occur in the body due to external effects.</p>			

Module 18

Code	Course/Module Title	ECTS	Semester
AE214	Digital Design and Presentation - AutoCAD	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	3	63	37
Description			
<p>AutoCAD is a vital tool for engineers and architects, enabling precise 2D and 3D design and drafting. Developed by Autodesk and first released in 1982, AutoCAD supports both 2D and 3D design capabilities. It allows users to create detailed 2D drawings and 3D models using solids, surfaces, and mesh objects. The software includes tools to automate drafting tasks, compare drawings, create schedules, and publish layouts. Users can also customize their workspace and use APIs and apps for enhanced productivity. AutoCAD provides tools for precise measurements and detailed designs, ensuring high-quality outputs. Automation features reduce the time required for repetitive tasks, increasing overall productivity. AutoCAD supports collaboration through web and mobile applications, allowing teams to capture, share, and review ideas on the go. It includes various toolsets designed for specific disciplines, such as architecture, mechanical, electrical, and more. AutoCAD can integrate with other software and file formats, enhancing its versatility and usability. It offers a flexible design environment that connects desktop, web, and mobile platforms, ensuring seamless project management and collaboration.</p>			

Module 19

Code	Course/Module Title	ECTS	Semester
AE215	Building Construction II	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
<p>Building Construction II is an architectural course that focuses on advanced topics related to the construction of buildings. It builds upon the foundational knowledge gained in Building Construction I and delves deeper into various aspects of the construction process. In this course, you can expect to explore subjects such as structural systems, building materials, construction methods, and advanced construction techniques. You will learn about different types of building systems, including steel, concrete, and timber structures, and gain an understanding of their design principles and applications. Additionally, the course may cover topics like building envelope systems, sustainable construction practices, building codes and regulations, and construction project management. You will also delve into the analysis and evaluation of building components and systems, understanding their performance, durability, and safety considerations. Throughout the course, you may engage in hands-on activities, such as construction site visits, laboratory experiments, and design exercises to reinforce your theoretical knowledge and develop practical skills. Overall, Building Construction II provides a comprehensive understanding of the technical aspects involved in the construction of buildings, preparing you to handle complex architectural projects with proficiency and expertise.</p>			

Module 20

Code	Course/Module Title	ECTS	Semester
UOS-2303	Baath Crimes in Iraq	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
<p>Studying the crimes of the Baath Party in Iraq is important to understanding modern Iraqi history and documenting violations to ensure that they are not repeated in the future. These crimes should be included in school curricula to educate future generations about the importance of human rights and justice.</p>			

Module 21

Code	Course/Module Title	ECTS	Semester
AE221	Architectural Design IV	10	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	8	150	100
Description			
<p>The comprehensive design studio focuses on a single project for the duration of term to synthesize relationships between spatial ideas, program, material, and technical systems. Studying precedents that helps to situate the project within a context of architectural forms and ideas, the students will develop their agenda through building materials and systems, also investigate technical systems that are applicable to the site and program and develop their relationships. They will employ multiple design scales, ranging from site to assembly, and modes of representation. The module introduces students to the main communication skills used in architecture, including spoken presentation, listening, various graphical techniques, model-making and information technology. The model of architectural education which focuses primarily around the design studio, is supported by lectures, seminars, field trips and workshops.</p>			

Module 22

Code	Course/Module Title	ECTS	Semester
AE222	History of Architectural II	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0	63	12
Description			
<p>The lesson is to identify the nature of the emergence of the first civilizations, their buildings, and their settlement in the Mesopotamia Valley, and to trace the development of architecture in them until the Islamic conquests that were affected by it, as the difference in thought and belief was shown. This will be preparing an architectural student with the ability to distinguish between architectural civilizations and giving the ability to know the philosophical and theoretical ideas of architectural design formations. They will learn about the most important historical periods of civilizations. The academic program includes two aspects, one of which complements the other (theoretical side) of the course in the form of lectures, (the practical side) represents the complementary side of the course and is represented by preparing reports for distinct architectural projects within the time periods that are studied within the prescribed curriculum and explaining philosophical ideas, formations and architectural design methods. Students are taught the design method according to the principles in terms of studying the architectural formations and details.</p>			

Module 23

Code	Course/Module Title	ECTS	Semester
AE223	Free Hand Drawing III	4	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	3	63	37
Description			
<p>The module Free hand II aim to learning how to draw Ideas, nature, materials & finishing ways with water color, & learn about different coloring technique. The acts of sketching and Free hand provide architects with much of their inspiration at the outset of the creative process. However, some move further into the realms of art to help them visualize their concepts, enjoying the fluidity and flexibility of paint and, in particular, the free-flowing qualities of water colors. Watercolors play more towards the colors and mantras of the work over the actual subject matter, creating beautiful accenting that highlights the subject matter even more This type of vibrance when compared to hyper realistic renderings is unparalleled. The advantages of water color include it's vibrant and translucent nature, quick drying time, simple set up and clean-up process, affordability, and versatility to be used in mixed media artwork.</p>			

Module 24

Code	Course/Module Title	ECTS	Semester
AE224	Digital Design and Presentation - Revit	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	2	48	27
Description			
<p>For every engineer, especially architects, computer programs are important tools as they help crystallize their ideas on the ground. In the current era, Building Information Modeling (BIM) has become the language of the industry as it represents the process of generating and managing building data throughout its life cycle, from construction, maintenance, occupancy, and finally, demolition. BIM uses three-dimensional, dynamic building modeling software to increase building design and construction productivity. To create a BIM model, a modeler uses intelligent objects called families to build the model. These families are present in the Revit program, whether they are universal or manufactured within the program. There are many benefits of BIM, such as :</p> <ul style="list-style-type: none">• Improved quality of construction drawings (CDs) .• Reduced time to prepare sheets .• Easy extraction of quantities and shared properties of materials for cost estimating. <p>The Revit disciplines include architectural modeling, structural modeling, mechanical modeling, electrical modeling, plumbing modeling, and coordination between all disciplines . Therefore, the main concept of BIM is that “a change anywhere is a change everywhere”.</p>			

Module 25

Code	Course/Module Title	ECTS	Semester
AE225	Survey	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	2	48	27
Description			
<p>The study of surveying in architecture enables the ability to deal and understand survey work in practical locations. Also, to identify engineering concepts in the field of surveying engineering related to architectural engineering work through design, implementation, and work auditing, in addition to the ability to control sites and visualize their phenomena initially without the need for Field visits and surveys Finally, to introduce and develop the basic understanding of the principles of engineering surveying. One of the main outputs of the study is familiarity with common survey tools and possession of some technical skills. Also, a basic understanding of settings in civil engineering that are determined by vertical coordinates. In addition to knowing the theory of measurement errors and adjustment concepts. They also have knowledge of the GNSS system, positioning systems, photogrammetry, distance measurement, and finally the skill of using the leveling device from the way it is installed and used to read the levels.</p>			

Module 26

Code	Course/Module Title	ECTS	Semester
UOS- 2304	Computer II	3	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	1	33	42
Description			
<p>It provides the student with a general idea about the computer subject and its various office applications as basic principles for a student in the College of Engineering, with the addition of some engineering applications that can be used by the architectural engineering student in his advanced stages.</p>			

Module 27

Code	Course/Module Title	ECTS	Semester
UOS-2305	Arabic II	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	0	33	17
الوصف			
<p>This course aims to enhance the linguistic skills of engineering students, focusing on the practical applications of the Arabic language in academic and professional contexts. Topics include improving technical writing skills, linguistic proofreading, and drafting engineering reports and correspondence clearly and accurately. The course also covers the analysis of specialized texts and the development of</p>			

presentation and communication skills to ensure students can effectively express their ideas in academic and professional environments.

Module 28

Code	Course/Module Title	ECTS	Semester
UOS-2306	English Language II	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
<p>The English Language II Module, based on the New Headway Pre-Intermediate course book, covers a wide range of topics. The module introduces and expands upon key themes and language skills to enhance English proficiency. The topics includes: focusing on vocabulary and grammar related to daily routines, describing people, discussing locations, and giving directions. Also, describing homes, talking about family relationships, and discussing daily activities at home. Education, professions, and discussing job experiences are covered. leisure activities, talking about preferences, and discussing past experiences are explained. Moreover, health and fitness, travel, cultures, technology, environmental issues, discussing sustainability, and expressing opinions on ecological topics. Each unit incorporates a variety of exercises, activities, and practical tasks to reinforce language skills, expand vocabulary, and improve overall fluency.</p>			

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