

Shatt Al-Arab University College



Bachelor of Science (B.Sc.) - Civil Engineering



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1. Overview

This catalogue is about the courses (modules) given by the program of Civil Engineering to gain the Bachelor of Science degree. The program delivers (38) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

Undergraduate Courses 2023-2024

Code	Course/Module Title	ECTS	Semester
E112	Mathematics	8	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
6	2	114	86
Description			
<p>Good understanding of General Mathematics. To give information about Integrations and derivations and how they are used in the physics field. Helping students to connect mathematics with physics. solving mathematical examples in their physics modules. better understanding of integration and derivations and their importance of them in physics.</p>			

Code	Course/Module Title	ECTS	Semester
E118	Engineering Drawings	10	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
6	4	142	108
Description			
<p>To enable the students to identify the tools/instrument needed. To familiarize the student, with the proper techniques, manipulation, uses, and care of the drawing instruments. To introduce the students to a specific language of engineers which is a graphical language. To help and guide the students to learn how technical drawings can be drawn in different methods. To acquire some different skills such as the ability to read and prepare engineering drawings, the ability to make free-hand sketching of objects, the power to imagine, analyze, and communicate, and the capacity to understand other subjects. To acquire adequate skills in measuring/scaling dimensions accurately, and the method of placing dimensions. To acquire basic analysis skills in orthographic/section/isometric drawing. To know the proper drawing conventions/symbols to describe the engineering drawings.</p>			

Code	Course/Module Title	ECTS	Semester
CE114	Engineering Geology	6	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
3	3	86	64
Description			
<p>To outline the contribution of engineering geology to civil and mining works. To explain the classical approach to solving an engineering geological problem. The extensive uses of engineering geology maps. The role and effect of engineering geology in the improvement of earth materials.</p>			

Code	Course/Module Title	ECTS	Semester
E119	Physics	3	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	1	44	31
Description			
Introducing students to the basic principles of physics.			

Code	Course/Module Title	ECTS	Semester
CE113	Engineering Mechanics	10	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
7	3	142	108
Description			
Frequently referred to as applied mechanics, it includes the study of the mechanical and other properties of materials, force analysis of stationary and movable structures, the dynamics and trusses.			

Code	Course/Module Title	ECTS	Semester
E116	Engineering workshop	4	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
1	3	58	42
Description			
Teaching and training students on practical activities related to the practical side in the workplace. Delivering the basic principles of using machines and equipment in engineering workshops and teaching them to students.			

Code	Course/Module Title	ECTS	Semester
U111	English	4	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	2	58	42
Description			
<p>Improve the students' skills of reading, speaking, and writing. Enrich the vocabulary of the student with new words related to Civil Engineering.</p>			

Code	Course/Module Title	ECTS	Semester
CE124	Building Material	8	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	4	114	86
Description			
<p>Definition of building materials and the importance of studying them. studying models of building materials. How to deal with building materials and benefit from them. History of building materials and ways to develop them. Studying all the properties related to building materials, including physical, chemical, mechanical, etc.</p>			

Code	Course/Module Title	ECTS	Semester
E125	Computer software	4	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	2	58	42
Description			
<p>To the knowledge of the most important components and basics of a computer. To understand algorithms and flowcharts. To learn how to use computer software (Word, Excel, and Power point)</p>			

Code	Course/Module Title	ECTS	Semester
E119	Chemistry	3	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	1	44	31
Description			
Introducing students to the basic principles of chemistry			

Code	Course/Module Title	ECTS	Semester
CE214	Fluid Mechanics	9	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
5	4	128	97
Description			
To develop problem-solving skills and understanding of Fluid Mechanics in civil engineering. This course deals with the basic concepts of Fluid Mechanics. This is the basic subject for all electrical and electronic circuits. To understand viscous fluid flow problems.			

Code	Course/Module Title	ECTS	Semester
E212	Applied mathematics	8	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
5	3	114	86
Description			
Resending polar coordinates and their applications in engineering. Presenting vectors and their applications in engineering. Presenting series and their applications in engineering. Presenting partial derivatives and their applications in engineering. Presenting multiple integral and their applications in engineering. Presenting complex numbers and their applications in engineering			

Code	Course/Module Title	ECTS	Semester
CE216	Concrete technology	7	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
3	4	100	75
Description			
<p>To develop an understanding about the fundamentals of concrete technology. To be aware of concrete historical development, general characteristics, types, and factors influencing Concrete properties. To discuss and understand the materials involved in making Concrete. Studying the concrete at its Fresh Stage including its design, estimation of material proportions as well as manufacturing, delivery, placing and curing. Study the concrete at it Hardened stage including understanding concepts such as Shrinkage and Creep as well as Durability of concrete. To understand the various laboratory tests required to be done for the concrete at various stages of its development.</p>			

Code	Course/Module Title	ECTS	Semester
CE216	Concrete technology	4	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	2	58	42
Description			
<p>Fortran is a general-purpose programming language mainly used by the scientific community. It is fast, and portable and it has seamless handling of arrays and parallelism. It is one of the earliest high level programming languages, and many recognize the original versions which used punched cards to encode the programs. Its name is a contraction of Formula Translation (old versions of the language are typically stylized as FORTRAN) and its creation marked the representation of mathematical expressions with more ease than lower-level assembly language. It is still widely used today in numerical weather prediction, physical and chemical modelling, applied mathematics, and other high-performance computing purposes. Fortran has a rich array of mathematical libraries and scientific codebases available. The newer standards continuously add modern functionality and are fully backward compatible.</p>			

Code	Course/Module Title	ECTS	Semester
U211	Engineering Ethics	4	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	0	30	20
Description			
<p>Preparing students for engineering work after graduation to deal with the challenges of the work environment. Teaching engineer practices in the work environment and human interaction with various projects. Increasing the engineer's awareness to deal with challenges in the work environment and dealing with different work parties.</p>			

Code	Course/Module Title	ECTS	Semester
CE213	Strength of Material	9	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
6	3	128	97
Description			
<p>The objective of this course is elaborate on the knowledge of engineering mechanics (statics) and to teach the students the purpose of studying strength of materials with respect to civil engineering design and analysis. The course introduces the students to the concepts of engineering mechanics of materials and the behavior of the materials and structures under applied loads.</p>			

Code	Course/Module Title	ECTS	Semester
CE215	Engineering Survey	9	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	5	128	97
Description			
<p>The aim of this Module is to provide the student with a deep understanding of surveying and construction activities; a practical application of topographic surveying skills, an awareness of the preliminary considerations involved in construction developments, and a knowledge of the materials and procedures employed in the construction of small commercial/industrial building works.</p>			

Code	Course/Module Title	ECTS	Semester
CE228	Building construction method and drawings	8	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	4	114	86
Description			
<p>Understanding the types of construction systems. The steps of starting and completing construction projects. Specifications and use of various construction equipment. The requirements and methods of implementation of projects. The general requirements and specifications of various construction works.</p>			

Code	Course/Module Title	ECTS	Semester
CE227	Engineering Statistics	4	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	2	58	42
Description			
<p>The module aims to present the basic of engineering statistics by analyzing, organizing and describing data in tables and drawings, knowing the measures of dispersion and central tendency, in addition to knowing the theory of probability and inference from the data to make decisions and linking them to engineering reality.</p>			

Code	Course/Module Title	ECTS	Semester
E126	Human rights and democracy	3	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	1	44	31
Description			
<p>Introducing students to the basic principles of human rights and clarifying those rights according to various sources. Addressing the basic concepts of democracy and its historical development.</p>			

Code	Course/Module Title	ECTS	Semester
CE311	Numerical engineering analysis	8	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
5	3	114	86
Description			
<p>Enable knowledge and understanding of practical applications of engineering analysis. Ability to identify different differential equations. Ability to build a mathematical model to represent various engineering processes. Ability to analyze and discuss. Enable knowledge and understanding of practical applications by numerical methods. Ability to identify different numerical method. Brainstorming by encouraging students to produce a large number of ideas about an issue or problem. Cooperative learning by working collectively.</p>			

Code	Course/Module Title	ECTS	Semester
CE312	Structure theory	8	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
5	3	114	86
Description			
<p>To develop an understanding of the basic principles of structural analysis and be able to explain them. To determine and analyze models of applied loads on structures. To develop and utilize influence lines of structures. To utilize various methods of analysis of beams, trusses, and frames to determine the response of both determinate and indeterminate structures. To understand the role of structural analysis within the context of engineering design and decision making.</p>			

Code	Course/Module Title	ECTS	Semester
CE315	Drainage and irrigation engineering	8	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
5	3	114	86
Description			
<p>Preparing and qualifying the civil engineer to meet the requirements of the labor market in the private and public sectors in irrigation and drainage engineering through diversifying the use of learning and teaching methods and training students to apply the acquired knowledge and skills to solve real problems of irrigation and drainage engineering designs. Presenting different designs of irrigation and drainage engineering methods, both theoretical and practical, to comply with international standards of academic quality and meet the needs of the labor market. Develop the knowledge and the method of scientific research in the field of irrigation and drainage engineering in a way that contributes to developing the design method, managing water resources and reducing waste in water resources. Preparing a scientific basis to keep pace with scientific development and pave the way for studying accurate topics in this specialty. It serves the needs of the governmental and private sectors and the society in all its institutions to establish irrigation and drainage systems.</p>			

Code	Course/Module Title	ECTS	Semester
CE318	Computer applications	6	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
3	3	86	64
Description			
<p>Teaching undergraduate students how to deal with applied engineering programs, such as the ETABS program used to analyze and design steel and concrete structures, as well as the Microsoft project program used in planning construction projects, estimating costs, project completion period, and controlling and evaluating projects.</p>			

Code	Course/Module Title	ECTS	Semester
CE314	Reinforced concrete design	10	6
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
5	5	142	108
Description			
<p>The model description provides the basic description of the main features of the course and the scientific outputs that the model student is expected to achieve if the student takes advantage of the learning opportunities available for the course. It should be compared with the description of the program.</p> <p>The course aims to present the basic methods of analysis and design of reinforced concrete structure including the introduction to the materials which produce the concrete and the materials tests in laboratory</p>			

Code	Course/Module Title	ECTS	Semester
CE313	Soil Mechanics	8	6
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	4	114	86
Description			
<p>includes the conception, analysis, design, construction, operation, and maintenance of a diversity of structures, facilities, and systems. All are built on, in, or with soil or rock. The properties and behavior of these materials have major influences on the success, economy, and safety of the work. Soils and their interactions with the environment are major considerations. Furthermore, detailed understanding of the behavior of earth materials is essential for mining, for energy resources development and recovery, and for scientific studies in virtually all the geosciences. To deal properly with the earth materials associated with any problem and project requires knowledge, understanding, and appreciation of the importance of geology, materials science, materials testing, and mechanics. Geotechnical engineering is concerned with all of these. Environmental concerns—especially those related to groundwater, the safe disposal and containment of wastes, and the cleanup of contaminated sites.</p>			

Code	Course/Module Title	ECTS	Semester
CE317	Traffic engineering	8	6
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	4	114	86
Description			
<p>This module will present the basic design concepts of Traffic Engineering to the students. The module will also present the Intersection Control and Design to the students. In addition to presenting the basic concepts of Transportation Engineering and Planning to the students which includes trip generation, trip distribution, traffic assignment and modal split. Also, the module will introduce an introduction to the Public Transportation.</p>			

Code	Course/Module Title	ECTS	Semester
CE316	Project management and engineering economics	4	6
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	2	58	42
Description			
<p>Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project's requirements. Basic project management for engineering; project development and economic justification; estimating; scheduling; network methods; critical path analysis; earned value management; project organizational structures; project risk assessment; resource allocation; ethics; characteristics of project managers.</p>			

Code	Course/Module Title	ECTS	Semester
CE411	Design of concrete structure	8	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	4	114	86
Description			
<p>To develop an understanding of the basic principles of structural analysis and be able to explain them. To determine and analyze models of applied loads on structures. To develop and utilize influence lines of structures. To utilize various methods of analysis of beams, trusses, and frames to determine the response of both determinate and indeterminate structures. To understand the role of structural analysis within the context of engineering design and decision-making.</p>			

Code	Course/Module Title	ECTS	Semester
CE412	Foundation engineering	10	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
6	4	142	108
Description			
<p>To evaluate the general suitability of the site and enable adequate and economical design for the proposed project. Calculate the safe bearing capacity of soils. Estimate the settlement of shallow foundations. Estimate the size of shallow foundations to satisfy bearing capacity and settlement criteria. Provide the steps of structural design for shallow foundations. Determine the allowable axial load capacity of single piles and pile groups. Determine the settlement of single pile and pile groups. Understand and determine lateral earth pressure. Understand the forces that lead to the instability of earth-retaining structures. Determine the stability of earth retaining structures (retaining walls, sheet pile walls, braced excavation).</p>			

Code	Course/Module Title	ECTS	Semester
CE417	Method of construction and estimation	5	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
3	4	72	53
Description			
<p>Introduction to the various construction techniques, practices, and equipment needed for different types of construction activities. It also leads the student through the steps of creating a detailed building estimate utilizing construction documents. Direct costs are generated by performing quantity take-offs and pricing with historical data, labor, and productivity rates. Students analyze subcontractor bids, generate indirect costs, and apply project margins to complete a building estimate.</p>			

Code	Course/Module Title	ECTS	Semester
CE418	Hydrology	4	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	2	58	42
Description			
<p>Preparing and qualifying specialized engineers to meet the requirements of the labor market in the private and public sectors in civil engineering through diversification of methods of learning and education and training students to apply the acquired knowledge and skills to solve real problems.</p> <p>Providing distinguished academic programs in the field of civil engineering, both theoretical and practical, that comply with international standards of academic quality and meet the needs of the labor market.</p>			

Code	Course/Module Title	ECTS	Semester
CE419	Harbour Engineering	3	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	1	44	31
Description			
<p>This module aims to produce human resources of well competent professionals in planning, designing and constructing of ports and harbors facilities with modern technologies. Presenting different designs of harbour engineering methods, both theoretical and practical, to comply with international standards of academic quality and meet the needs of the labor market. The purpose of the course is to provide an overview of techniques for the design of harbors as well as preserving and recovering beaches and the shoreline in the presence of human impact.</p>			

Code	Course/Module Title	ECTS	Semester
CE416	Sanitary engineering	8	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	4	114	86
Description			
<p>Compute the quantity of potable water, recognize the materials used in piping works, design water pumping stations, design water treatment systems, assess the environmental impact of untreated sewage discharge, compute the quantity of sanitary sewage, compute the quantity of storm water, design sewer systems, design sewage treatment systems, and design sludge treatment systems.</p>			

Code	Course/Module Title	ECTS	Semester
CE415	Highway Engineering and Pavement Design	8	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	4	114	86
Description			
<p>The course aims to present the basic elements of geometric design for highways and deals with the dimensions and layout of visible features of the highway. The features normally considered are the cross-section elements, sight distance consideration, horizontal curvature, gradients, and intersection. The course aims to present the basic element for designing the pavement (flexible & Rigid) also analyze all stresses and applied loads on the pavement and take into consideration choosing the materials used in the pavement construction.</p>			

Code	Course/Module Title	ECTS	Semester
CE413	Steel structure design	6	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
4	2	86	64
Description			
<p>Understanding steel as a structural material, and get knowledge of its mechanical properties. Familiarity with design codes and standards. Learning to identify and evaluate the various loads. Acquiring the skills to design beams and plate girders. Design of tension members. Design of compression members. Understanding the principles and techniques for designing steel connections</p>			

Code	Course/Module Title	ECTS	Semester
CE414	Hydraulic engineering	4	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
2	2	58	42
Description			
To study and design the different types of hydraulic structures. Understand the causes of failure of the hydraulic structures and its solutions. To choose a suitable hydraulic structures in the project.			

Code	Course/Module Title	ECTS	Semester
CE420	Engineering project	4	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USWL (hr/w)
0	4	58	42
Description			
Ensuring the capabilities of the graduate student to invest the knowledge he possesses and the writing, research and documentation capabilities he possessed during his studies. Giving the graduate student an opportunity to apply what he learned and implement it in the vital field of his major. Establishing the value of scientific honesty in research and research writing during the stages of documenting and writing the research report. Provide an opportunity for the graduate student to work collaboratively if he works within a team. Enhancing the student's value and skill system by enabling him to choose, apply, research, conclude, analyze and adhere to the values of scientific integrity and the ethical values of scientific research.			