Al-karkh University of Science

جامعة الكرخ للعلوم

First Cycle – Bachelor's degree (B.Sc.) – Civil Engineering

بكالوريوس علوم - الهندسة المدنية

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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 52 Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة المدنية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج ٥٢ مادة دراسية، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
KUS11001	Mathematics	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
This course provides students with a comprehensive introduction to integral calculus, focusing on both theoretical understanding and practical application. It establishes a solid foundation in the principles and methods of integration, enabling students to compute indefinite and definite integrals of a wide range of functions. Advanced integration techniques are introduced and explored through illustrative examples that demonstrate their relevance in solving real-world problems. The course emphasizes the development of logical and analytical reasoning skills, fostering a systematic and accurate approach to mathematical problem solving. Applications of integration in geometry, physics, and related fields are examined to reinforce conceptual understanding and practical relevance. By promoting clarity, precision, and structured computation, the course prepares students for advanced studies that require calculus-based analysis and mathematical modeling.			

Module 2

Code	Course/Module Title	ECTS	Semester
KUS11002	Fundamentals of computer	3	1

	science		
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	48	27
Description			
This course introduces students to the fundamental concepts of computer science, providing a comprehensive overview of computer systems and their practical use. It covers the basic components of computers, including hardware, software, and data representation, along with an introduction to operating systems and graphical user interfaces. The course develops essential digital literacy skills through hands-on experience with word processing, spreadsheet, and presentation software. Students are also introduced to the fundamentals of the Internet, web browsing, and electronic communication, as well as modern concepts of cloud computing and digital collaboration tools. In addition, the course provides an introductory foundation in programming using the Python language, enabling students to develop basic problem-solving skills and computational thinking required for further studies in computing and engineering.			

Module 3

Code	**Course/Module Title**	**ECTS**	**Semester**
KUS11003	Democracy and Human Rights	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	17
Description			
This course introduces students to the concept of human rights and their fundamental nature, with an emphasis on understanding their philosophical, legal, and social foundations. It examines the historical development of human rights across different eras and civilizations, highlighting the distinction between human rights and other forms of rights. The course explores human rights as reflected in divine religions and analyzes their influence on societies and social values. It also examines the recognition of human rights within international conventions, treaties, and agreements, as well as the role of national legislation in their protection and enforcement. In addition, the course addresses the emergence and role of non-governmental organizations in promoting and defending human rights. The course further introduces the concepts of democracy, freedoms and their various forms, and citizenship as reflected in different legal and legislative systems, aiming to promote civic awareness and responsible participation in society.			

Module 4

Code	**Course/Module Title**	**ECTS**	**Semester**
CEN11004	Engineering Drawing	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	2	48	77
Description			

The module aims to develop students' ability to communicate technical ideas through graphical representation. It covers the fundamentals of engineering drawing, use of instruments, geometric constructions, orthographic and isometric projections, sectional views, and dimensioning. Students will learn to interpret and create machine and assembly drawings following BIS/ISO standards and gain introductory skills in computer-aided drafting (CAD). The course enhances visualization, accuracy, and understanding of engineering components and systems.

Module 5

Code	Course/Module Title	ECTS	Semester
CEN11005	Physics	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
This course provides an introduction to the fundamental concepts and core branches of physics, emphasizing physical quantities, units, vectors, and the nature of electric charge, fields, and forces. It examines the structure of atoms, types of matter, and the behavior of electric charge, with particular focus on Coulomb's law, electric dipoles, and electric potential energy. The course develops a solid understanding of basic electrical principles, including Ohm's law, resistance, capacitance, inductance, and the behavior of alternating current (AC) circuits. In addition, it introduces the physics of semiconductors, covering atomic configuration, charge carriers, doping processes, and the distinction between intrinsic and extrinsic materials. The formation and operation of PN junctions and semiconductor diodes under forward and reverse bias conditions are also discussed, providing students with essential knowledge for further studies in electronics and engineering applications.			

Module 6

Code	Course/Module Title	ECTS	Semester
CIV11006	Engineering Mechanics	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	87
Description			
This module introduces students to the fundamental concepts of mechanics and structural analysis, providing a foundation for understanding the behavior of engineering structures under various loading conditions. It develops students' ability to analyze truss systems and determine internal forces using established analytical methods. The module explores the principles of friction and their applications in mechanical systems, along with the study of centroids for lines, areas, and composite shapes. Key topics include the calculation and application of moments of inertia for single and composite areas, the concept of the product of inertia, and the use of Mohr's circle for transforming inertia properties. Emphasis is placed on analytical reasoning and systematic problem solving through practical engineering examples. The module prepares students for advanced studies in structural analysis, mechanics, and related engineering disciplines.			

Module 7

Code	Course/Module Title	ECTS	Semester
CIV11007	Chemistry	4	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	37
Description			
This module provides students with a solid foundation in fundamental chemistry concepts essential for engineering applications. It develops an understanding of atomic structure, chemical bonding, and molecular interactions, alongside quantitative chemical analysis and stoichiometry for practical problem solving. The module introduces the principles of thermodynamics and chemical kinetics to explain chemical behavior and reactions, and explores acid–base chemistry, solutions, and electrochemistry. An introductory overview of organic chemistry and engineering-relevant materials is included, emphasizing applications related to construction materials, sensors, and electronic devices relevant to Civil Engineering and AI & Robotics fields. Through analytical exercises and applied examples, the module enhances problem-solving abilities and promotes critical thinking within chemical and engineering contexts.			

Module 8

Code	Course/Module Title	ECTS	Semester
CIV12008	Mathematics II	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	52
Description			
The module			

Module 9

Code	Course/Module Title	ECTS	Semester
CIV12009	Engineering Drawing II	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62

Description
The module

Module 10

Code	Course/Module Title	ECTS	Semester
KUS12010	Arabic Language	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	17
Description			
The module			

Module 11

Code	Course/Module Title	ECTS	Semester
KUS12011	English Language	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	17
Description			
The module			

Module 12

Code	Course/Module Title	ECTS	Semester
CIV12012	Geology	5	2

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
The module			

Module 13

Code	Course/Module Title	ECTS	Semester
CIV12013	Workshop	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
-	3	48	27
Description			
The module			

Module 14

Code	Course/Module Title	ECTS	Semester
CIV12014	Engineering Mechanics II	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
The module			

Module 15

Code	Course/Module Title	ECTS	Semester

CIV12015	Building Materials	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	37
Description			
The module			

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