University OF MOSUL

Second Cycle – Bachelor's Degree (B.Sc.) –
Computer Engineering

بكالوريوس - هندسة الحاسوب

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1. Overview

This catalogue is about the courses (modules) given by the program of Computer Engineering to gain the Bachelor of Science degree. The program delivers (50) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

2. Undergraduate Courses 2024-2025

Module 1

Code	Course/Module Title	ECTS	Semester
UOM1031	Computer1	3	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	63	12
Description			
Computing Fundamentals and Office applications will be cover during this course. Computing Fundamentals includes computer hardware and software and how they work together. The course guide students to explore the windows operating system, change settings, and customize the desktop. Students also learn how to manage files and folders. On the other hand, the Key Applications focuses on two of the Microsoft Office applications: Word and Excel.			

Module 2

Code	Course/Module Title	ECTS	Semester
UOM1040	Democracy and Human Rights	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
Among the objectives of the human rights course is to raise awareness of the Iraqi woman (the mother) about her role in the field of exercising her role within her small family, which serves as a micro-community and to exercise her role towards her children by granting them (children's rights), which are included in the framework of (human rights) because the child is the most important pillar and infrastructure In the Iraqi society, which serves as the first nucleus for the establishment of a healthy and healthy society, free from psychological complexes and behavioral disorders, and raising the awareness of the mother about her duties towards her children, not to practice beating and psychological and physical violence, and to treat them in a sound and humane manner, and that the circumstances and daily hard work do not reflect on her behavior towards her children, and this in my opinion is one of the most important goals Which I seek to consolidate when teaching the subject (Human Rights), which considers the rights of the child as one of the most important points and pillars,In addition to directing the father to treat her children with dignity and produce a healthy child mentally, physically and psychologically. Introducing the Iraqi human rights stipulated in the Iraqi constitutions, especially the permanent Iraqi constitution of 2005. Awareness of individuals about the types of rights they enjoy, such as the first generation of rights represented by civil and political rights and the second generation Of rights such as economic, social and cultural rights. Activating the role of civil society institutions in the field of Iraqi human rights. Introducing human rights and spreading a culture of awareness among individuals of the types of rights they enjoy as citizens.			

Module 3

Code	Course/Module Title	ECTS	Semester
CO103	Mathematics 1	7	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	1	78	97
Description			
The objective of this course is to introduce students to four main topics of mathematics Prerequisites for calculus, Limits, and Continuity, Differentiation methods, Vectors and Analytic Geometry in Space, Matrices, and Solution of system of equations by matrix.			

Module 4

Code	Course/Module Title	ECTS	Semester
CO104	Engineering Drawing by Computer	4	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
0	3	48	52
Description			
(1) to develop a knowledge of both manual and computer-generated engineering drawing. (2) to create, edit and print a variety of technical drawings using a CAD system. (3) to communicate design ideas and technical information to engineers and other professionals throughout the design process (4) An engineering drawing represents a complex three-dimensional object on a two-dimensional piece of paper or computer screen by a process called projection			

Module 5

Code	Course/Module Title	ECTS	Semester
CO105	Electrical Circuits Analysis1	7	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	4	108	67
Description			
1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems.			

Module 6

Code	Course/Module Title	ECTS	Semester
CO106	Electronics Physics	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	1	63	62
Description			
1-The student learns an idea about the atomic structure, energy levels, and conductivity of minerals. Concepts of Modern Physics, Semiconductor Materials, 2- The student will be introduced to semiconductors and diodes, their types and applications in the field of communication science, and an understanding of electronic circuits and the most important electronic elements included in the designs of these circuits. PN-junction diode ،Potential barrier، drift current ،Depletion layer and capacitor, forward and reverse bias ،Temperature effect on diode characteristics ،Types of diodes ، Diodes applications.			

Module 7

Code	Course/Module Title	ECTS	Semester
UOM1021	English Language1	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
This course develops further knowledge of the grammar and of essential vocabulary in order to lead the students to an advanced level of proficiency. Emphasis is placed on developing listening, speaking, reading and writing skills through an integrated approach. It focuses on grammar and fundamental writing skills. By the end of the course, students are expected to: 1. Understand the main ideas of a variety of written and spoken texts 2. Participate effectively in a short conversation using appropriate language 3. Produce a range of text types in the form of a logical and cohesive paragraph 4. Select appropriate vocabulary to talk about feelings, opinions and experiences. 5. Recognize, understand and use a number of phrasal verbs and collocations. 6. Use effective organizational strategies that include introductions, paragraphs, transitions, and conclusion			

Module 8

Code	Course/Module Title	ECTS	Semester
CO108	Programing using C++ Language	7	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	3	93	82
Description			
1. This course introduces students to C++ programming language. 2. Understanding the effort needed to successfully develop engineering-oriented software.			

Module 9

Code	Course/Module Title	ECTS	Semester
UOM1011	Arabic Language1	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
The aim of this semester is to enable students to read correctly and acquire the ability to use language correctly in communication with others, such as speed, quality of delivery, and eloquence. It also aims to teach students to listen well, develop their literary taste, and accustom them to correct, clear expressions.			

Module 10

Code	Course/Module Title	ECTS	Semester
CO110	Mathematics 2	7	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	1	78	97
Description			
This subject provides students with the basic skills of Mathematics, which is the core of many mathematical disciplines such as optimization, financial mathematics, statistics, simulation, etc. This subject introduces students to the fundamental concepts and skills of Mathematics.			

Module 11

Code	Course/Module Title	ECTS	Semester
CO111	Electrical Circuits Analysis 2	7	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	4	108	67
Description			
1. To develop problem solving skills and understanding of circuit analysis theorems through the application of (superposition, source transformation, mesh analysis, Nodal analysis) 2. To Determine the conditions for maximum power transfer to any circuit element 3. To understand the importance of transients in RL, RC & RLC. 4. To understand the principals of Resonant circuits 5. To understand the principals of Three-phase circuits			

Module 12

Code	Course/Module Title	ECTS	Semester
CO112	Digital System Fundamentals	7	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	4	93	82
Description			
The basic objective of this course is to give an introduction to digital logic design with an emphasis on practical design techniques and hardware circuit implementation. Topics include number representation in digital computers, Boolean algebra theorems, theory of Boolean logic functions, mapping techniques and logic function minimization, design of combinational and interactive digital circuits such as magnitude comparators, binary decoder and encoder, adder and subtractor logic circuits. An introduction on designing digital circuits using schematic capture and logic simulation is included.			

Module 13

Code	Course/Module Title	ECTS	Semester
CO201	Engineering Mathematics 1	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	0	63	62
Description			
This course gives the students some more advanced subjects in engineering mathematics as partial derivative, differential equations, series and Fourier series and Multiple Integrals, this is to prepare the student for the next course and the other subjects like the numerical and engineering analysis.			

Module 14

Code	Course/Module Title	ECTS	Semester
CO202	Analog Electronics	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	3	93	57
Description			
This course covers the operating principles, analysis, design and applications of some semiconductor devices underpinning electronic systems. It builds on the foundational of the electrical concepts developed at level I and provides an in-depth exploration of important non-linear devices: diodes, bipolar junction transistors and field-effect transistors. Equivalent circuit models for these devices are developed and applied to the analysis and design of practical systems, such as voltage rectifiers and amplifiers. Important system concepts are introduced along the way, including calculating gains and frequency responses. Operational amplifier op-amp circuits and its applications in different practical circuits such as positive and negative feedback are presented in this course. The course includes a practical laboratory to apply the concepts and understand the main theoretical ideas.			

Module 15

Code	Course/Module Title	ECTS	Semester
CO203	Microprocessors 1	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	72
Description			
The aim of the Microprocessor 1 course is to provide students with a solid understanding of the 8086 architecture, instruction set, machine code, assembly coding, debugging techniques, and the use of INT services.			

Module 16

Code	Course/Module Title	ECTS	Semester
UOM2022	English Language 2	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			

1. Study grammar, (verb tenses, structure sentence, question words, adverbs and adjectives, quantity, articles, verb pattern, prepositions, comparative and superlative).
2. Learn Vocabulary, focus on all academic words specifically in environmental engineering field.
3. Study comprehensive reading in variety subjects.
4. Focus on listening and speaking using videos and conversation between students in class.
5. Study how to write an academic paragraph.

Module 17

Code	Course/Module Title	ECTS	Semester
CO205	Object Oriented Programing	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	47
Description			

This module aims to provide an introduction to the fundamentals of object-oriented programming using C++.

Module 18

Code	Course/Module Title	ECTS	Semester
CO206	Programmable Logic Design	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	72
Description			
The basic objective of this course is to instruct the students the basic principles of modern digital systems and programmable logic design. Topics covered include design and analysis of clocked sequential digital circuits such as flip-flops, shift registers, counters, and pattern detectors; the architectural concepts of different programmable logic devices (PLDs); Hazards in combinational logic circuits and eliminating techniques; field programmable gate array (FPGA) design techniques using very high-speed circuit hardware description language (VHDL) and introduction to modeling, simulation, synthesis (with Xilinx, Altera, or Intel FPGAs). This course will present the syntax, structure, and data types used in HDLs and gain proficiency in writing basic HDL code.			

Module 19

Code	Course/Module Title	ECTS	Semester
CO207	Computational Methods for Data Analysis	3	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1	48	27
Description			
The course "Computational Methods for Data Analysis" is designed to provide students in the Bachelor of Science in Computer Engineering program with a solid foundation in both numerical analysis and statistics. This course combines key concepts and techniques from both disciplines to equip students with the necessary tools to analyze and interpret data in various engineering and computational contexts.			

Module 20

Code	Course/Module Title	ECTS	Semester
CO208	Engineering Mathematics 2	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	0	63	62
Description			
● This course gives the students the ability to solve and investigate differential equations using different methods, two types of differential equations will be covered (1st order and second order, linear and non-linear), in doing so, the students will gain an advantage for the next courses in that some signal processing and control system problems that will be easier to solve. Also, the Laplace transform can be analyzed and more information about this transform can be gained and investigated ● To develop mathematical skills so that students are able to apply mathematical methods & principles in solving problems from Engineering fields. ● To make aware students of the importance and symbiosis between Mathematics and Engineering			

Module 21

Code	Course/Module Title	ECTS	Semester
CO209	Statistics	2	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
The course "Statistics" is designed to provide students in the Bachelor of Science in Computer Engineering program with a solid foundation in statistics. This course combines key concepts and techniques from both disciplines to equip students with the necessary tools to analyze and interpret data in various engineering and computational contexts.			

Module 22

Code	Course/Module Title	ECTS	Semester
CO210	Digital Electronics	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1	48	52
Description			
1. To develop problem solving skills and understanding of digital electronics principles through the application of (Kirchhoff's theorems). 2. To determine the static power consumption of any gate. 3. To understand the importance of noise margins. 4. To understand the principals of figure of merits. 5. To determine the fan out of any gate.			

Module 23

Code	Course/Module Title	ECTS	Semester
CO211	Microprocessors 2	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	72
Description			
The objective of this course is to integrate with the prerequisite course (Microprocessor I) by introducing the signals and functions of the 8086 Microprocessor. It covers the design of interface circuits with memories and basic input/output devices, and provides hands-on experience through simulation tools in the Microprocessor LAB. The course also covers different register types within the 80X86 Microprocessor family, and provides an overview of math coprocessing, real and protected modes. Additionally, it includes an introduction to MMX technology and a brief overview of various architectures utilized in the development of the 80X86 Microprocessor family.			

Module 24

Code	Course/Module Title	ECTS	Semester
CO212	Data Structures	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	4	93	57
Description			
The module aims to introduce students to a wide variety of data structures and algorithms. It provides students with a coherent knowledge of techniques for implementing data structures and algorithms. It also discusses different data structures and algorithms' complexity, advantages, and disadvantages. Finally, it introduces the main algorithms for fundamental tasks such as sorting and searching.			

Module 25

Code	Course/Module Title	ECTS	Semester
UOM2050	Baath Party crimes in Iraq	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
• Educating students about the crimes committed by the Baath regime in Iraq • Guiding students to familiarize themselves With crimes…			

Module 26

Code	Course/Module Title	ECTS	Semester
UOM2012	Arabic Language2	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
The aim of this semester is to enable students to read correctly and acquire the ability to use language correctly in communication with others, such as speed, quality of delivery, and eloquence. It also aims to teach students to listen well, develop their literary taste, and accustom them to correct, clear expressions.			

Module 27

Code	Course/Module Title	ECTS	Semester
CO301	Data Communications	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	3	93	57
Description			
This course will cover many topics and concepts of computer networks and data communication. The topics that will be covered during this course will include the first layer (physical layer), and the second (data link layer). The topics of data communication includes: network devices and transmission media, data and signal transmission, digital and analog transmission, analog transmission, bandwidth utilization, multiplexing, error detection and correction. The topic of computer networks includes: switching (circuit-switched and packet networks), data link control, multiple access links and protocols. The objective of this course is to provide fundamentals of computer networks and data communication.			

Module 28

Code	Course/Module Title	ECTS	Semester
CO302	Signals and Systems	4	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	0	48	52
Description			
● An ability to identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics. ● An ability to acquire and apply new knowledge and using appropriate learning strategies. ● An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams. ● To Analyze the discrete-time signals and systems in the time domain using Frequency response ● To Understand the relationship between continuous and discrete signals ● To Applying the fundamental theories in continues signal and convert it to discrete signal ● To understand the properties if the digital signal and systems			

Module 29

Code	Course/Module Title	ECTS	Semester
CO303	Computer Architecture I	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	0	48	77
Description			

1. This course provides the basic knowledge necessary to understand the hardware operation of digital computer.
2. It presents the various digital components used in the organization and design of digital computer.

It shows the necessary steps that designer must go through in order to design an elementary basic computer.

Module 30

Code	Course/Module Title	ECTS	Semester
CO304	Computer Interface	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	72
Description			

1. Learn both hardware and software aspect of I/O interfaces into microprocessor-based systems.
2. Gain hands- on experience with, common microprocessor peripherals such as PPI, USART, Timers, ADC and DAC, DMA, PIC.
3. Understanding the main I/O chips in terms of (internal architecture, I/O programming and applications.

Interfacing the external devices to the processor.

Module 31

Code	Course/Module Title	ECTS	Semester
CO305	Operating Systems I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	72
Description			

- Exploring the importance of operating systems, their goals and functions.
- Introduction to designing and implementing operating systems.
- Covers the various techniques used by the operating system to manage resources.
- Introducing the student to the concepts and structure of various operating systems, how they w internally, and their most important main parts.

Teaching the student the concept of the program, methods of scheduling it on the central processing unit, and how to implement it using many different algorithms. How to manage the clustering of processes (processes, threads, CPU scheduling, synchronization, and learning about the concept of deadlock) and ways to solve the problem of system stagnation and try to prevent or avoid it.

Module 32

Code	Course/Module Title	ECTS	Semester
CO306	Artificial Intelligence Fundamentals	3	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	42
Description			

1. This course let the students be familiar with some new algorithms and methods in artificial intelligence and machine learning.
2. The algorithms are based on the natural behavior of the different organisms.

Also, to give the ability to apply these methods in designing and understanding real-world systems.

Module 33

Code	Course/Module Title	ECTS	Semester
CO307	Computer Networks	7	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	3	93	82
Description			
This course will cover many topics and concepts of computer networks. The topics that will be covered during this course will include the network, transport, and application layers of the TCP/IP. The main topics in this course discuss the general issues related to the network layer, IPV4 and IPV6, routing protocols unicast and multicast, discuss the general idea and issues behind the transport layer, discuss the two current protocols UDP, and TCP. Discuss general idea and issues behind the application layer and the protocols DHCP, FTP, TFTP, HTTP, TELNET, SMTP, POP, and IMAP.			

Module 34

Code	Course/Module Title	ECTS	Semester
CO308	Digital Signal Processing	4	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	0	48	52
Description			
To analyze the discrete-time signals and systems in the frequency domain using Frequency response. To understand the relationship between S-transform and Z- transform. To applying the previous facts to find the Transfer function in the Z domain or S domain and find the total solution of the difference equation. To design FIR and IIR filters using a variety of techniques.			

Module 35

Code	Course/Module Title	ECTS	Semester
CO309	Computer Architecture 2	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	0	48	77
Description			
1) Provides the basic knowledge necessary to understand the principle of micro programmed control. 2) Highlights on the central processing unit and the RISC & CISC Characteristics. Gives the understanding of pipeline concepts and design.			

Module 36

Code	Course/Module Title	ECTS	Semester
CO310	Embedded Systems	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	72
Description			

1. Provide Foundational Knowledge:
    - Develop a solid understanding of embedded systems, focusing on the architecture and operation ATmega2560.
2. Explore Microcontroller Architecture:
    - Deepen students' knowledge of the ATmega2560 microcontroller architecture, including its core components, memory organization, and peripheral integration.
3. Hands-On Experience with Arduino ATmega2560:
    - Provide practical experience with the Arduino ATmega2560 platform, enabling students to interface with sensors, actuators, and other peripherals through General Purpose Input/Output (GPIO) pins.
    - Equip students with the skills to program the ATmega2560 microcontroller, utilizing its instruction set, addressing modes, and serial communication capabilities.
4. Develop Practical Skills in Embedded System Design:
    - Encourage the use of ATmega2560's features, such as timers, counters, and interrupt handling, to solve complex embedded system challenges.

Encourage the use of ATmega2560's features, such as timers, counters, and interrupt handling, to solve complex embedded system challenges.
These aims are designed to ensure that students not only understand the theoretical aspects of embedded systems but also gain practical, hands-on experience with the Arduino ATmega2560, preparing them for future work in the field of embedded systems design and development.

Module 37

Code	Course/Module Title	ECTS	Semester
CO311	Operating Systems 2	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	72
Description			

- The operating system provides an established, convenient, and efficient interface between user programs and the bare hardware of the computer on which they run.
- In this course we will explore the core principles of operating systems design and implementation, including file systems and storage; memory management techniques; virtualization and distributed systems. Provides the basic knowledge necessary to understand the principle of operating systems.
- This course provides an established, convenient, and efficient interface between user

programs and the hardware of the computer on which they run.

- Gives the understanding principles of operating systems design and implementation, including file systems and storage; memory management techniques; virtualization and distributed systems.

Module 38

Code	Course/Module Title	ECTS	Semester
CO312	Occupational safety	2	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	0	18	32
Description			

1. Naming all the Types of hazards in the work places
2. Using the basic concepts of engineering to determine the risk levels for the work places
3. Monitoring the figure of merit of the safety and controlling ways
4. Select the suitable assessments after summarizing the hazard types of work palaces
5. Ability of decide suitable assessment for any situations
6. Make the place healthy and safety to perform a certain duty
7. Make the place healthy and safety to perform a certain duty
8. Ability of deconstruct any situation to evaluate the problems
9. Select the suitable solution after summarizing the different types of hazards

Module 39

Code	Course/Module Title	ECTS	Semester
CO401	Professional Ethics	2	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	0	18	32
Description			

1. Define and understand concepts of ethics and professional ethics.
2. Develop knowledge of and describe basic ethical theories and principles for ethical decision-making.
3. Identify and think through moral situations and issues encountered by a wide range of different professionals.
4. Apply ethical theories and principles to specific moral challenges and dilemmas faced by professionals.
5. Develop and improve skills essential in analyzing and resolving ethical problems and conflicts in professional settings through the use and application of ethical theories.

Module 40

Code	Course/Module Title	ECTS	Semester
CO402	Control Systems Fundamentals	8	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	4	108	92
Description			
The course explains all principles and fundamentals of control system.			

Module 41

Code	Course/Module Title	ECTS	Semester
CO403	Real Time Systems	7	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	97
Description			
The course teaches all principles and fundamentals of real time system and gives all hardware and software components of any real time system.			

Module 42

Code	Course/Module Title	ECTS	Semester
CO404	Elective Course	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	67
Description			

Module 43

Code	Course/Module Title	ECTS	Semester
CO405	Software Engineering	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	92
Description			
• The introduction of software engineering • The principles of software engineering and software process. Their goals and functions. • The main aim is to highlight the use of software engineering in our life so that student will be able to plan the way o building various applications and will be able to choose the suitable life- cycle model. The aim of including project in this course is to improve the practical abilities of the students as well as oral capabilities.			

Module 44

Code	Course/Module Title	ECTS	Semester
CO406	Parallel Computer Architecture	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1	48	52
Description			
provides the necessary knowledge to design a new computer system; to improve an existing one; to develop fast parallel computing algorithms and systems			

Module 45

Code	Course/Module Title	ECTS	Semester
CO407	Graduate Project	8	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
0	5	78	122
Description			

Module 46

Code	Course/Module Title	ECTS	Semester
CO408	Computer Graphics	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	67
Description			
The description of this course provides an introduction to OpenGL graphical programming and various computer graphics algorithms in the two-dimensional space such as scanning transformation, pruning, geometric transformations with the most important characteristics and basics of the image, the human vision system, methods of representation and processing of digital images (image reduction and enlargement, damaged image recovery, noise removal, and methods for image compression by lossy and others), in addition to modern methods of pressing. This qualifies the student to deal with computer graphics and images and their processing required in computer uses and research related to this and in the labor market.			

Module 47

Code	Course/Module Title	ECTS	Semester
CO409	Cyber Security	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	67
Description			
This is an under graduate level course on network security' The course involves both a reading /lecture/discussion and a term project' We will read and discuss topics on various aspects of network security: Ciphering &Encryption, block and stream ciphering, public key' cryptanalysis' key management and distribution and Applied security			

Module 48

Code	Course/Module Title	ECTS	Semester
CO410	Mobile Systems Fundamentals	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	72
Description			

1. Comprehensive understanding of mobile systems and their practical applications.
2. Knowledge of fundamental principles, concepts, and components of mobile systems.
3. Familiarity with various mobile technologies, including cellular networks and wireless communication.
4. Proficiency in mobile application development using programming languages and tools.
5. Awareness of security challenges and privacy considerations in mobile systems.
6. Ability to design and develop user-friendly mobile applications.
7. Critical thinking and problem-solving skills for mobile system challenges.
8. Research and evaluation capabilities for emerging mobile system trends.
9. Effective collaboration and communication skills in mobile system projects.
10. Consideration of ethical implications in mobile system development.
11. Emphasis on lifelong learning to keep up with evolving mobile technologies.

Preparation for careers in mobile app development, system management, or technology research.

Module 49

Code	Course/Module Title	ECTS	Semester
CO411	Image Processing and Applications	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1	48	52
Description			

This course covers the fundamental theories and algorithms widely used in digital image processing and its applications. Students will be introduced to current technologies and challenges specific to image processing systems. The course includes topics such as representation, sampling and quantization, image acquisition, imaging geometry, noise and blur types and causes, image restoration models, image transforms, image enhancement, smoothing and sharpening techniques, image compression, and their applications in the field of biometrics.

Module 50

Code	Course/Module Title	ECTS	Semester
CO412	Elective Course	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1	48	52
Description			

Contact

Salah Abd alghany | Ph.D. in computer Engineering | Prof.
Email: eng.salah@uomosul.edu.iq
Mobile no.: 07709638189

Shawkat Khairullah | Ph.D. in computer Engineering | Assist Prof.
Email: shawkat.sabah@uomosul.edu.iq
Mobile no.:07713987505