Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation
Apparatus Directorate of Quality Assurance and
Academic Accreditation Department

Academic Program and Course Description Guide

2026

Introduction:

The educational program of computer engineering department consists of a carefully structured series of courses, organized within an academic syllabus that outlines specific learning procedures and experiences. Its primary aim is to enhance and develop students' competencies, preparing them effectively for employment and meet the requirements of the job market. To ensure its quality and relevance, the program undergoes annual reviews and assessments through internal evaluations or external mechanisms, such as the External Examiner Program.

The academic program description provides a brief overview of the program's key components and its courses. It highlights the specific skills students are expected to develop in alignment with the program’s objectives. This description plays a vital role in the accreditation process and is collaboratively prepared by the faculty under the guidance of academic committees within the relevant departments.

This second edition of the guide presents an updated description of the academic program, incorporating revisions to the sections and content from the previous version. These updates reflect recent changes and advancements in the Iraqi educational system, including the academic program description in both its traditional formats—annual and semester-based, as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this context, it is essential to stress the significance of preparing academic program and course descriptions, as they are crucial for the effective operation of the educational process.

Academic Program Description Form

University Name: University of Mosul

Faculty/Institute: College of Engineering

Scientific Department: Computer Engineering Department

Academic or Professional Program Name: Bachelor's in Computer Engineering

Final Certificate Name: Bachelor's in Computer Engineering

Academic System: Bologna process (First, Second, Third Years), Courses System (Fourth Year)

Courses Description Preparation Date: September 2025

File Completion Date: September 2025

Signature:
Head of Department Name:
Prof. Dr. Salah Abdulghani Jaro
Date: 15/4/2026

Signature:
Scientific Associate Name:
Asst. Prof. Dr. Ayman T. Hameed
Date: 15-4-2026

The file is checked by:

Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance
Department: Asst. Prof. Rana Burhan Abdulrahman
Date: 15/4/2026
Signature:

Approval of the Dean
Prof. Dr Omar M. Hamdoon
15-4-2026

Concepts and terminology:

Academic Program Description: The academic program description offers a concise overview of its vision, mission, and goals, along with a clear outline of the intended learning outcomes, aligned with defined instructional strategies.

Course Description: It presents a concise overview of the course's key features and the expected learning outcomes for students, serving as evidence of how effectively they have benefited from the learning opportunities provided. This description is based on the overall academic program description.

Program Vision: A forward-looking vision for the academic program that is advanced, inspiring, motivating, realistic, and achievable.

Program Mission: It concisely outlines the goals and the actions required to achieve them, while also identifying the program's development strategies and future directions.

Program Objectives: These are statements that define what the academic program aims to accomplish within a set timeframe, and they are both measurable and observable.

Curriculum Structure: This includes all courses or subjects offered within the academic program, based on the approved learning system (semester-based, annual, or Bologna Process), whether they are required by the ministry, university, college, or academic department, along with their corresponding credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: These are the methods employed by faculty members to enhance student teaching and learning. They consist of planned approaches aimed at achieving the learning objectives and encompass all classroom and extracurricular activities designed to fulfill the program's learning outcomes.

1. Program Vision

The Department of Computer Engineering aspires to be a leading center in specialized fields such as computer networks, intelligent systems, and others that contribute to the technological advancement of Iraqi society and the labor market. The department also seeks to implement international academic quality standards in order to prepare highly competent engineers and researchers capable of keeping pace with scientific developments and providing innovative solutions through the integration of theoretical knowledge with practical applications.

2. Program Mission

1- Preparing qualified engineers to work in the field of computer engineering.

2- Equipping graduates with distinguished skills and advanced knowledge that enable them to face contemporary technological challenges with competence and efficiency.

3- Providing qualified experts holding advanced academic degrees in various fields of computer engineering, thereby contributing to serving society and benefiting from their scientific and research expertise.

4- Developing students' abilities and strategies to deal with real-world problems through the enhancement of constructive and advanced scientific thinking skills.

5- Improving students' communication skills, encouraging teamwork, and supporting outstanding and creative ideas.

6- Strengthening ties with department alumni by actively involving them in scientific seminars, conferences, and continuous learning activities.

3. Program Objectives

1- Preparing engineering cadres distinguished by high professional ethics, teamwork spirit, and the knowledge and skills required to design, analyze, and develop computer systems, while maintaining follow-up with them after graduation.

2- Continuously updating curricula to follow the scientific progress and meet labor market needs, adopting quality standards and principles of sustainable engineering to serve society within the framework of national development.

3- Keeping up with the latest scientific research across different specializations through faculty research as well as graduate theses and dissertations, while fostering a culture of lifelong learning, research, and self-development.

4. Program Accreditation

The program does not yet have program accreditation.

5. Other External Influences

The Ministry of Higher Education and Scientific Research is the sponsor of the program

6. Program Structure

Program Structure	Number of Courses	Credit Hours	Percentage	Reviews
Institution Requirements	7	15		
College Requirements				
Department Requirements	43	196		
Summer Training				The student must complete 4 weeks of summer training to fulfill the requirements for the bachelor's degree
Other				

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
2025-2026/First S1	UOM1021	English Language 1	2	0
2025-2026/First S1	UOM1040	Democracy and Human Rights	2	0
2025-2026/First S1	CO103	Mathematics I	4	0
2025-2026/First S1	CO104	Engineering Drawing by Computer	0	3
2025-2026/First S1	CO105	Electrical Circuits Analysis1	3	3
2025-2026/First S1	CO106	Physics I	3	0
2025-2026/First S1	UOM1031	Computer 1	2	2

2025-2026/First S2	CO108	Programming using C++ Language	3	3
2025-2026/First S2	UOM1011	Arabic Language 1	2	0
2025-2026/First S2	CO110	Mathematics II	4	0
2025-2026/First S2	CO111	Electrical Circuits Analysis 2	3	3
2025-2026/First S2	CO112	Digital System Fundamentals	2	3
2025-2026/Second S1	CO201	Mathematics III	4	0
2025-2026/Second S1	CO202	Analog Electronics	3	3
2025-2026/Second S1	CO203	Microprocessors 1	2	3
2025-2026/Second S1	UOM2022	English Language 2	2	0
2025-2026/Second S1	CO205	Object Oriented Programing	2	3
2025-2026/Second S1	CO206	Programmable Logic Design	2	3
2025-2026/ Second S2	CO207	Numerical Analysis	2	0
2025-2026/ Second S2	CO208	Mathematics IV	4	0
2025-2026/ Second S2	CO209	Statistics	2	0
2025-2026/ Second S2	CO210	Digital Electronics	2	
2025-2026/ Second S2	CO211	Microprocessors 2	2	3
2025-2026/ Second S2	CO212	Data Structures	2	3
2025-2026/ Second S2	UOM2050	Baath Regime Crimes in Iraq	2	
2025-2026/ Second S2	UOM2012	Arabic Language 2	2	
2025-2026/Third S1	CO301	Data Communications	3	3
2025-2026/Third S1	CO302	Mathematics V	4	0
2025-2026/Third S1	CO303	Computer Architecture 1	3	0
2025-2026/Third S1	CO304	Embedded Systems	2	3
2025-2026/Third S1	CO305	Operating Systems	2	3
2025-2026/Third S1	CO306	Artificial Intelligence Fundamentals	2	0
2025-2026/Third S2	CO307	Computer Networks	3	3
2025-2026/Third S2	CO308	Digital Signal Processing	3	0
2025-2026/Third S2	CO309	Computer Architecture 2	3	0

2025-2026/Third S2	CO310	Mathematics VI	4	0
2025-2026/Third S2	CO311	Physics II	4	0
2025-2026/Third S2	CO312	Engineering Project Design and Planning	2	
2025-2026/Fourth S1	PRET401	Professional Ethics	1	
2025-2026/Fourth S1	FUCS402	Fundamentals of Control Systems	3	3
2025-2026/Fourth S1	RETS403	Real Time Systems	2	3
2025-2026/Fourth S1	WINE405	Software Engineering	2	3
2025-2026/Fourth S1	ARPP406	Parallel Computer Processing	2	2
2025-2026/Fourth S1	ELCO404	Machine Learning Programming	2	2
2025-2026/Fourth S2	GRPO411	Graduation Project	4	
2025-2026/Fourth S2	COGR412	Computer Graphics	2	
2025-2026/Fourth S2	CYSE413	Cyber Security	2	
2025-2026/Fourth S2	FUMS414	Fundamentals of Mobile Systems	2	3
2025-2026/Fourth S2	IMPA415	Image Processing and Applications	2	
2025-2026/Fourth S2	ELCO416	Applied Sciences	3	

8. Expected Learning Outcomes of the Program

Knowledge

- Ability to identify, formulate, and solve computer engineering problems using foundations in engineering, science, and mathematics, and applying techniques such as digital system design, embedded systems, real-time systems, and computer networks. (Outcome 1)

- Capability to apply the engineering design process to produce solutions that meet specified needs while considering public health, safety, economic, social, and environmental factors. (Outcome 2).

- Recognition of the need for lifelong learning, selecting appropriate learning strategies, and staying current with emerging technologies such as artificial intelligence, the Internet of Things, and cloud computing. (Outcome 6).

Skills

- Proficiency in developing and conducting appropriate experiments, analyzing and interpreting data, and using engineering judgment to draw reliable conclusions supporting technical decision-making. (Outcome 3).
- Skill in communicating effectively, both orally and in writing, in Arabic and English with teams, clients, and the wider community. (Outcome 4).
- Competence in working effectively as a member or leader of multidisciplinary teams by setting goals, planning tasks, meeting deadlines, and creating a collaborative and inclusive environment. (Outcome 7).

Ethics

Awareness of ethical and professional responsibilities and the ability to make informed decisions considering the economic, environmental, and societal impact of engineering solutions at local and national levels, including safe practices in areas such as cybersecurity and data privacy. (Outcome 5).

9. Teaching and Learning Strategies

- Giving lectures inside classrooms.
- Interaction between the teacher and students through training lectures.
- Conducting practical experiments in laboratories.
- Assigning the learner to conduct a report on a specific topic.
- Assigning the learner to conduct a specific practical project.
- Conducting oral exams by discussing a specific issue.
- Conduct daily examinations.
- Conducting quarterly exams.

10. Evaluation Methods

- Conducting oral exams by discussing a specific issue.
- Conduct daily examinations.
- Conducting quarterly exams.

GRADING SCHEME
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success	A - Excellent	امتياز	90 - 100	Outstanding Performance

Group (50 - 100)	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Shefa Abdulrahman Dawwd	Computer Engineering	Architecture of real-time applications and neural networks		Staff	
Ahmed Mamoon Fadhil Alkababji	Electrical Engineering	Signal processing and real-time		Staff	
Salah Abdulghani Jaro	Computer Engineering	Computer networks		Staff	
Rabee M. Hagem	Electronics and Communications Eng.	Embedded wireless communications		Staff	

Mayada Faris Ghanim	Computer Engineering	Computer networks and communications		Staff	
Turkan Ahmed Khaleel	Computer Science	Computer networks		Staff	
Furat Younis Abd Alrazzaq	Computer Engineering	Communication networks		Staff	
Shawkat Sabah Khairullah	Computer Engineering	Computer architecture and dependable systems		Staff	
Amar Idrees Daood	Computer Engineering	Signal processing and real-time		Staff	
Ali Mukhlif Ahmed	Computer Engineering	Signal processing		Staff	
Akram Abdul Maujood Dawood	Computer Engineering	Signal processing		Staff	
Sahar Khalid Ahmed	Computer Science	Image processing		Staff	
Ina'am Fathi Khudher	Computer Engineering	Computer networks		Staff	
Dhafir Abdulfattah Abdulqader	Computer Engineering	Computer architecture		Staff	
Maher Mohammed Fawzi	Computer Engineering	Signal processing		Staff	
Amar Abdulhamid Kheder	Electrical Engineering	Communications		Staff	
Modhar Ahmed Hammoudy	Electrical Engineering	Electronics and Communications Engineering		Staff	

Sura Nawfal Abd Alrazzaq	Computer Engineering	Computer graphics		Staff	
Warqaa Younis Ibrahim	Computer Engineering	Control and computers		Staff	
Zahraa Talal Abed	Computer Engineering	Computer Engineering		Staff	
Sura Ramzi Sharif	Computer Science	Computer science		Staff	
Basman Mahmood Hasan Alhafidh	Computer Engineering	Embedded systems		Staff	
Mazin Hashim Aziz	Electronics and Communications Eng.	Image processing and artificial intelligence		Staff	
Nada Ismail Najim	Electronics and Communications Eng.	Computer and communications networks		Staff	
Samar Ammar Yasir	Computer Engineering	Digital signal processing		Staff	
Ola Tariq Salim	Computer Engineering	Computer Engineering		Staff	
Noor Mowfaq Jabr	Computer Engineering	Computer Engineering		Staff	
Mustafa Seham Abdel Rahman	Computer Engineering	Computer Engineering		Staff	
Hussein Mahmood Mohammed	Computer Engineering	Computer Engineering		Staff	
Hothayfa Rabea Mohammed	Computer Engineering	Computer Engineering		Staff	

Mohammad Tarik Mohammad	Computer Engineering	Embedded systems		Staff	
Ola Marwan Assim	Computer Engineering	Computer Engineering		Staff	
Hassan Fakhry Hassan	Computer Technology Engineering	Computer Engineering		Staff	
Hamed Abdul Aziz Mahmood	Computer Engineering	Hybrid computer systems		Staff	
Sanabil Ahmed Mahmood	Computer Technology Engineering	Computer systems engineering		Staff	
Jumana Abdullah Karim	Computer Engineering	Computer Engineering		Staff	
Muhanad Faris Saleh Alatallah	Computer Technology Engineering	Computer Engineering		Staff	
Ahmed Taha Hammo	Computer Science	Optical communications and networks		Staff	
Qasim Abdullah Ahmed	Computer Engineering	Computer Technologies Engineering		Staff	
Farah Nazar Ibraheem	Computer Engineering	Computer Engineering		Staff	
Ahmed Samir Ahmed	Computer Technology Engineering	Computer Engineering		Staff	
Shaymaa Nazar Hussein	Education	Computer teaching methods		Staff	
Farah Natiq Yaseen	Computer Engineering	Computer Engineering		Staff	

Ban Aziz Asi	Electrical Engineering	Electrical Engineering		Staff	
Hiba Dhyaa Ali	Computer Science	Computer Science		Staff	
Manar Muzahim Alawi	Computer Science	Software		Staff	
Hayfaa Ahmed	Computer Engineering	Computer Engineering		Staff	
Noor Salah	Computer Engineering	Computer Engineering		Staff	

Professional Development

Mentoring new faculty members

- Teaching participation in the teaching methods course.
- The teacher passes the teaching competency course.
- Teaching participation in practical laboratories.
- Teacher participation in giving discussion lectures.

Professional development of faculty members

A. Academic and professional development for faculty members
B. Participation in international, Arab and local scientific conferences and workshops.
C. The possibility of using some local scientific skills in teaching or conducting scientific research.
D. Using modern technology and advanced educational methods in teaching.

12. Acceptance Criterion

Admission requirements: The policy for accepting new students in the Department of Computer Engineering is as follows: The applicant for admission to preliminary studies in the Department of Computer Engineering must have an Iraqi preparatory certificate or its equivalent according to scientific standards. In addition to accepting the first student from the Department of Computer Science and the Institute of Computer Systems.

The Ministry of Higher Education and Scientific Research is responsible for accepting students, and it is centralized according to the department's accommodation plan, the student's grade, and his desire. The accepted student then submits the required documents within the specified period for registration.

Admissions: General conditions for admission:

A student who is accepted into universities is required to be:

1- Iraqi nationality.

2- Holds an Iraqi preparatory school certificate supported by the approval of the General Directorate of Education in the governorate or its equivalent.

3- The student must have been born as determined by the Ministry in that academic year.

4- To pass the medical examination according to the conditions of each study.

5- Graduates:

a. Current academic year.

B. For the previous academic year, those who have not been centrally accepted into any college or institute are accepted according to the minimum year of their graduation.

6- Non-Iraqi students who hold an Iraqi preparatory certificate and are centrally accepted are notified in writing to refer to the Central Admissions Department/Immigrant Division to clarify their exemption or claim for tuition fees in foreign currency in accordance with the controls contained in Chapter Seven.

The general principles adopted by the central admission system:

Nomination of students for admission to colleges and institutes shall be in accordance with the central admission system implemented electronically according to the following principles:

1- The student is accepted according to the choices shown in the application form through the electronic portal of the Department of Studies, Planning and Follow-up and on the basis of competition in general.

2- The student's submission of the admission form is not considered obligatory in order to be accepted according to the choices presented by him permanently, as his acceptance depends on his competition with the rest of the students according to the established principles.

13. The most important sources of information about the program

- Head of Department.
- Department rapporteur.
- Examination Committee.
- scientific Committee.
- Curriculum Committee.
- Study program guide from the Quality Committee.

14. Program Development Plan

A) Supporting the educational institution for the purpose of full-time study.

B) The great need for holders of university degrees to develop the country.

C) The extent of government support for official companies

Program Skills Outline											
Year/Level	**Course Code**	**Course Name**	**Basic or Optional**	**Required program Learning outcomes**						
				knowledge			**Skills**			**Ethics**
				GO1	**GO2**	**GO6**	**GO3**	**GO4**	**GO7**	**GO5**
	UOM1021	English Language 1	Basic					•		
	UOM1040	Democracy and Human Rights	Basic							•
	CO103	Mathematics I	Basic	•						
	CO104	Engineering Drawing by Computer	Basic				•			
	CO105	Electrical Circuits Analysis1	Basic	•			•			
	CO106	Physics I	Basic	•						
	UOM1031	Computer 1	Basic				•			
	CO108	Programming using C++ Language	Basic			•	•			
	UOM1011	Arabic Language 1	Basic					•		
	CO110	Mathematics II	Basic	•						
	CO111	Electrical Circuits Analysis 2	Basic	•			•			
	CO112	Digital System Fundamentals	Basic	•			•			
	CO201	Mathematics III	Basic	•						
	CO202	Analog Electronics	Basic	•			•			
	CO203	Microprocessors 1	Basic	•			•			
	UOM2022	English Language 2	Basic					•		
	CO205	Object Oriented Programing	Basic			•	•			
	CO206	Programmable Logic Design	Basic	•			•			

	CO207	Numerical Analysis	Basic	•						
	CO208	Mathematics IV	Basic	•						
	CO209	Statistics	Basic	•						
	CO210	Digital Electronics	Basic	•						
	CO211	Microprocessors 2	Basic	•			•			
	CO212	Data Structures	Basic	•		•	•			
	UOM2050	Baath Regime Crimes in Iraq	Basic							•
	UOM2012	Arabic Language 2	Basic					•		
	CO301	Data Communications	Basic	•						
	CO302	Mathematics V	Basic	•						
	CO303	Computer Architecture 1	Basic	•	•					
	CO304	Embedded Systems	Basic		•		•			
	CO305	Operating Systems	Basic	•			•			
	CO306	Artificial Intelligence Fundamentals	Basic	•						
	CO307	Computer Networks	Basic	•	•		•			
	CO308	Digital Signal Processing	Basic	•						
	CO309	Computer Architecture 2	Basic	•	•					
	CO310	Mathematics VI	Basic	•						
	CO311	Physics II	Basic	•						
	CO312	Engineering Project Design and Planning	Basic							•
	PRET401	Professional Ethics	Basic	•						•
	FUCS402	Fundamentals of Control Systems	Basic	•	•		•			
	RETS403	Real Time Systems	Basic	•	•		•		•	

	WINE405	Software Engineering	Basic	•						
	ARPP406	Parallel Computer Processing	Basic	•	•					
	ELCO404	Machine Learning Programming	Basic	•						
	GRPO411	Graduation Project	Basic						•	
	COGR412	Computer Graphics	Basic	•						
	CYSE413	Cyber Security	Basic	•						
	FUMS414	Fundamentals of Mobile Systems	Basic	•	•					
	IMPA415	Image Processing and Applications	Basic	•						
	ELCO416	Applied Sciences	Basic	•						

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Republic of Iraq - Ministry of Higher Education and Scientific Research

University of Mosul

Bachelor's degree in Computer Engineering (Second cycle)

Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr

Program Curriculum (2025-2026)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي

جامعة الموصل

بكالوريوس في هندسة الحاسوب (الدورة الثانية)

أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة

المنهاج الدراسي للعام 2025-2026

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	ect (hr/w	ab (hr/w	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL nuse	USSWL hr/sem	SWL nuse	ECTS	Module Type	Prerequisite Module(s) Code
UGI	One	1	UOM1021	English Language 1	اللغة الانكليزية 1	English	2		0				3	33	17	50	2.00	B	
		2	UOM1040	Democracy and Human Rights	ديمقراطية و حقوق انسان	Arabic	2		0				3	33	17	50	2.00	B	
		3	CO103	Mathematics I	الرياضيات I	English	4		0		1		3	78	97	175	7.00	C	
		4	CO104	Engineering Draving by Computer	الرسم الهندسي بواسطة الحاسوب	English	0		3				3	48	52	100	4.00	S	
		5	CO105	Electrical Circuits Analysis1	تحليل الدوائر الكهربائية 1	English	3		3		1		3	108	67	175	7.00	C	
		6	CO106	Physics I	فيزياء I	English	3		0		1		3	63	62	125	5.00	C	
		7	UOM1031	Computer 1	حاسوب 1	English	2		2				3	63	12	75	3.00	B	
						Total	16	0	8	0	3	0	21	426	324	750	30		

UGI	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	ect (hr/w	ab (hr/w	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL nuse	USSWL hr/sem	SWL nuse	ECTS	Module Type	Prerequisite Module(s) Code
	Two	1	CO108	Programing using C++ Language	البرمجة باستخدام لغة C++	English	3		3				3	93	82	175	7.00	C	
		2	UOM1011	Arabic Language 1	اللغة العربية 1	Arabic	2		0				3	33	17	50	2.00	B	
		3	CO110	Mathematics II	الرياضيات II	English	4		0		1		3	78	97	175	7.00	C	CO103
		4	CO111	Electrical Circuits Analysis 2	تحليل الدوائر الكهربائية 2	English	3		3		1		3	108	67	175	7.00	C	CO105
		5	CO112	Digital System Fundamentals	مبادئ النظم الرقمية	English	2		3		1		3	93	82	175	7.00	C	
						Total	14	0	9	0	3	0	15	405	345	750	30.00		

Course Description Form

1. Course Name:	
English Language1	
2. Course Code:	
UOM1021	
3. Semester/Year:	
First Semester / First Year	
4. Description Preparation Date:	
30-4-2024	
5. Available Attendance Forms:	
In class	
6. Number of Credit Hours(Total)/Number of Units(Total)	
30/2	
7. Course administrator's name (mention all, if more than one name) Dr. Basman Mahmood Hasan Alhafidh	
Name: Basman Mahmood Hasan Alhafidh Email: bm.alhafidh@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	This course focuses on building on the language skills and knowledge acquired in previous levels, with the aim of developing students' fluency, accuracy and overall linguistic competence. By the end of the course, students will acquire these skills: 1) Vocabulary Expansion: Enhance students' vocabulary by introducing them to new words, idiomatic expressions, and constructions. This includes both general and subject-specific vocabulary relevant to upper intermediate level. 2) Grammar development: Enhance and expand students' understanding of English grammar. This may involve revisiting and reinforcing previously learned grammatical points and introducing more complex structures and tenses. 3) Reading Comprehension: Improving reading skills through a variety of texts, such as articles, short stories, and excerpts from novels. Students will focus on understanding main ideas, identifying supporting details, and inferring meaning from context. 4) Writing skills: Developing writing abilities through guided exercises and assignments. Students may be encouraged to write essays, reports, letters, or other types of texts, focusing on coherence, consistency, and accuracy. 5) Listening Comprehension: Enhance listening skills through a range of authentic audio materials, including dialogues, interviews and lectures. Students will practice understanding main ideas, specific details, and implicit information.

	6) Speaking and Conversation: Encouraging students to express themselves confidently and fluently through various speaking activities. This includes participating in discussions, debates, role-plays and presentations, with an emphasis on accuracy, coherence and appropriate use of language. 7) Cultural Awareness: Expand students' understanding of English-speaking cultures and societies through authentic materials and discussions on various topics. This aims to enhance intercultural communication skills and foster a deeper appreciation of diverse viewpoints.

9. Teaching and Learning Strategies

Strategy	The main strategy to be adopted in the delivery of this unit is to encourage students' participation in the exercises, while at the same time improving and expanding their critical thinking skills. This will be achieved through interactive classroom and tutorials and by considering the type of simple experiments that include some sampling activities that are of interest to students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Review And learn grammar for the class	UNIT 1: A world of difference Grammar: Simple, continuous, perfect, active and passive. Reading: Saro's story "Lost and found".	In Class Lecture	daily oral
2	2	Learn conversation for class and speaking style	UNIT 1 A world of difference: Speaking: Missing words.	In Class Lecture	Quiz
3	2	Learn the art of listening by analyzing and applying synonyms	UNIT 1 A world of difference!: Listening: Things I miss from home. Vocabulary: Compound words.	In Class Lecture	daily oral and homework
4	2	Learn, analyze, create and present reports	Report submission feedback and instructions how to make a good presentation.	In Class Lecture	homework
5	2	Evaluation and application of	Presentation day, giving feedback and	In Class Lecture	Quiz

		instructions for making reports and presentations	presentation notes.		
6	2	Review And learn grammar for the class	UNIT 2 The working week: Grammar: Present perfect simple and continuous. Reading: Our plastic planet.	In Class Lecture	homework
7	2	Learn conversation for class and speaking style	UNIT 2 The working week: Speaking: Fillers, adding emphasis.	In Class Lecture	daily oral and homework
8	2	Learn the art of listening by analyzing and applying synonyms	UNIT 2 The working week : Listening: Dreams come true. Vocabulary: Hot verbs, make and do.	In Class Lecture	homework
9	2	And learn grammar for the class	UNIT 3 Good times,bad times times: Grammar: Narrative tenses. Reading: Book at bedtime.	In Class Lecture	daily oral
10	2	Learn conversation for class and speaking style	UNIT 3 Good times, bad times: Speaking: Giving and receiving news.	In Class Lecture	daily oral
11	2	Learn the art of listening by analyzing and applying synonyms	UNIT 3 Good times, bad times: Listening: The clinging woman. Vocabulary: Books and films	In Class Lecture	Quiz
12	2	Learn conversation for class and speaking style	Speaking test for group 1 of students. Each students takes about 5-7 minutes for the test.	In Class Lecture + Online	Class test
13	2	Learn conversation for class and speaking style	Speaking test for group 2 of students. Each students takes about 5-7 minutes	In Class Lecture + Online	Class test

			for the test.		
14	2	Analyze, apply and evaluate what the student has learned during the semester	Reviewing the Units 1-3, checking the workbook answers, and open discussion.	In Class Lecture	Full review
15	2	Final Evaluation	Pre-Final Exam	written exams	Pre-final test

11. Course Evaluation	
Quizzes	15
Homework	9
Report and Presentation	16
Pre-Final Test	10
Final Test	50
Total	100

12. Learning and Teaching Resources	
Required textbooks(curricular book if any)	
Main references (sources)	SOARS, J. & SOARS, L. 2014. New Headway -Intermedi Fourth Edition: Student's Book and iTutor Pack, OUP Oxford.
Recommended books and reference (scientific journals, reports)	
Electronic references, websites	https://elt.oup.com/student/headway/intermediate/?cc=us&sel nguage=en

Course Description Form

1. Course Name :	
Democracy and Human Rights	
2. Course Code :	
UOM1040	
3. Semester/Year :	
First Semester /First Year	
4. Description Preparation Date :	
2026/4/30	
5. Available Attendance Forms :	
In Class	
6. Number of Credit Hours(Total)/Number of Units(Total)	
2/50	
7. Course administrator's name (mention all, if more than one name)	
Dr. Nihal Abdelwahab Hamid	
8. Course Objectives :	
Among the objectives of the Human Rights course is to raise the awareness of Iraqi women (mothers) regarding their role within their small family unit, which represents a miniature society. The course also aims to encourage mothers to fulfill their responsibilities toward their children by granting them children's rights, which fall within the framework of human rights. Since children are the fundamental pillar of Iraqi society and the primary nucleus for building a healthy and stable community free from psychological complexes and behavioral disorders, special emphasis is placed on their well-being. The course further seeks to educate mothers about their duties toward their children, including refraining from physical punishment and psychological or physical violence, and treating them humanely and properly, so that daily life pressures and work-related stress do not negatively affect their behavior toward their children. In my opinion, this is one of the most important objectives that I strive to instill while teaching Human Rights, in which children's rights constitute one of its main pillars. In addition, the course aims to guide fathers to treat their children with dignity and to raise them in a sound intellectual, physical, and psychological manner. The course also introduces Iraqi human rights as stipulated in the Iraqi constitutions, particularly the Permanent Iraqi Constitution of 2005. It seeks to raise awareness among individuals about the various types of rights they enjoy, such as civil and political rights (first-generation rights) and economic, social, and cultural rights (second-generation rights). Moreover, the course aims to strengthen the role of civil society	Course Objectives

organizations in the field of human rights in Iraq, and to promote awareness and understanding of human rights among individuals regarding the rights they possess as citizens.	
Teaching and Learning Strategies : .9	
The main strategy adopted in delivering this course unit is to encourage students' participation in exercises while simultaneously developing and enhancing their critical thinking skills. This will be achieved through classroom sessions, interactive lessons, and by conducting simple experiments involving practical activities that stimulate students' interest and engagement.	Strategy

Course Structure .10

Evaluation Method	Learning Method	Unit or Subject Name	Required Learning Outcomes	Hours	Week
		What is right and what is human		2	1
		What are human rights		2	2
		Historic Human Rights in Iraqi Civilizations, in Greek Civilization, Roman and Persian Civilization		2	3
		Historical Human Rights in the Middle Ages Feudalism, the Church, and the Institution of Monarchy (King)		2	4
		Historical Human Rights in the Middle Ages Feudalism, the Church, and the Institution of Monarchy (King)		2	5
		Human rights in law legislation		2	6
		revolutions of the west		2	7
		East revolutions and human rights		2	8
		Human rights in the Universal Declaration of 1948		2	9
		Economic, social and cultural human rights		2	10
		modern human rights		2	11
		Regional recognition of human rights		2	12
		European Convention on Human Rights 1953		2	13
		The Arab Organization for Human Rights 1998		2	14
		Final Exam		2	15

Course Evaluation .11

10% (10)	Quizzes
10% (10)	Homework
0	Test Summarization
20% (10)	Report
10% (20)	Pre-Final Test
50% (50)	Final Test
Learning and Teaching Resources .12	
Core scientific textbooks, external references, and United Nations texts and conventions in the field of human rights, including the Universal Declaration of Human Rights issued in 1948.	Required textbooks(curricular books,
	in references (sources)
	Recommended books and references (scientific journals, reports)
	ctronic references, websites

Course Description Form

1. Course Name:
Mathematics I
2. Course Code:
CO103
3. Semester/Year:
First / First
4. Description Preparation Date:
30/4/2026
5. Available Attendance Forms:
Lectures
6. Number of Credit Hours(Total)/Number of Units(Total):
175/7
7. Course administrator's name
Name: Dr. Samar Ammar Yasir Email: samarammar@uomosul.edu.iq Name: Dr. Ola Marwan Assim Email: ola.marwan@uomosul.edu.iq
8. Course Objectives

Course Objectives	• The objective of this course to provide 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.

9. Teaching and Learning Strategies	
Strategy	The main strategy to be adopted in the delivery of this course is to equip students with the skills needed to understand mathematics, specifically in functions and their graphs, limits, and continuity, differentiation methods, vectors, matrices, and solution of system of equations by matrix. At the same time, improving and expanding students' thinking skills in strong foundations, mathematical concepts and techniques applied to various disciplines in computer engineering, including optimization, financial mathematics and simulation. This will be achieved through classes and interactive tutorials.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Apply and understand the fundamental of coordinates and graphs in the plane. Slope, and	Coordinates and graphs in the plane. Slope, and equations for lines. Circles and parabolas.[ch1]	Lecture & Tutorial	Class Exam

		equations for lines. Circles and parabolas graphs.			
2&3	10	Apply and understand the fundamental of properties and operations of functions scientific contexts, including domain, range and their graphs.	Functions and their graphs. Horizontal and vertical shifts, scales and reflections. [ch1]	Lecture & Tutorial	Quiz Home work
4	5	Apply and understand the fundamental and properties and operations of trigonometric functions in engineering and scientific contexts, including domain, range and their graphs	A review of trigonometric functions and their graphs. Horizontal and vertical shifts, scales and reflections. [ch1]	Lecture & Tutorial	Home work
5	5	Explain the fundamental of limits and sandwich theorem. .	Limits of functions. The sandwich theorem [ch2] + quiz	Lecture & Tutorial	Quiz
6	5	Explain the concept of limits involving infinity. Continuity and their implications in mathematical analysis.	Limits involving infinity. Continuous functions [ch2]	Lecture & Tutorial	Class Exam
7	5	Demonstrate and compute derivatives of functions using various techniques.	Slope, tangent lines, and derivatives. Differentiation rules. Derivatives of trigonometric functions. [ch3]	Lecture & Tutorial	Quiz

8	5	Demonstrate and compute derivatives of functions using various techniques, and understand their applications in engineering and science.	The chain rule and implicit differentiation and fractional powers. Velocity, speed and other rate of change. [ch3]	Lecture & Tutorial	Home work
9	5	Understand the concept of linear approximation and apply linear approximation to estimate values, understand and compute differentials, use differentials to estimate errors and changes	Linear approximations and differentials .[ch3]	Lecture & Tutorial	Home work
10	5		Mid exam		Exam
11	5	Identify and demonstrate matrix terminology, properties and operations.	Types and properties of matrices. Operations of matrices: addition, subtraction, scalar multiplication and matrix multiplication. [ch8]	Lecture & Tutorial	Class Exam
12	5	Identify and demonstrate operations of matrices.	Operations of matrices such as transposition, determinant, adjoin and inverse matrix. .[ch8]	Lecture & Tutorial	Quiz
13	5	Solve systems of linear equations using matrix methods, such as matrix inverses.	Solution of Linear Equations using Cramer's Rule. .[ch8] +quiz	Lecture & Tutorial	Home work
14	5	Solve systems of	Gaussian	Lecture	Quiz

		linear equations using Gaussian elimination.	elimination method. [ch8]	& Tutorial	
15	5		Final exam		Exam
11. Course Evaluation					
Quizzes: 20% (20) Onsite Assignments: 8% (8) Online Assignments: 8% (8) Reports: 4% (4) Midterm Exam: 10% (10) Final Exam: 60% (60)					
12. Learning and Teaching Resources					
Required textbooks(curricular books, if any)			• Calculus by Thomas and Finny. • Thomas' Calculus: Early Transcendentals 13th Edition by George B. Thomas,2014		

Course Description Form

1. Course Name:	
Engineering Drawing by Computer	
2. Course Code:	
CO104	
3. Semester/Year:	
FIRST/FIRST	
4. Description Preparation Date:	
2/5/2026	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total)	
48 hours /4 units	
7. Course administrator's name (mention all, if more than one name)	
Roua Suhail Mohammad	
8. Course Objectives	
Course Objectives	Upon successful completion of this course, students will be able to: 1. Identify, analyze, and solve complex engineering problems according to the principles of engineering, science, and mathematics. 2. Recognize methods for acquiring and applying new knowledge and using appropriate learning strategies. 3. Understand the importance of professional and ethical participation and collaboration in various projects to work within multidisciplinary teams. 4. Become familiar with AutoCAD software, its basic commands, and the necessary tools for professional 2D drawing, design, and drafting. 5. Learn various drawing commands in AutoCAD, such as lines, circles, arcs, ellipses, polygons, and other geometric shapes, to create accurate and clear 2D drawings. 6. Understand techniques for modifying and editing drawings using commands like erase, trim, extend, mirror, stretch, offset, chamfer, fillet, and other related tools to refine and adjust designs as needed. 7. Comprehend the principles of dimensions and annotations in engineering drawings, how to apply dimension commands, create texts, and use different line types and dimension styles to accurately convey measurements and notes. 8. Explore advanced features and techniques in AutoCAD, including working with layers, using design templates, inserting and managing blocks, working with 3D models, applying shading commands and improved visualization, and utilizing the View Center and other related tools.
9. Teaching and Learning Strategies	

Strategy	The main strategy to be adopted in delivering this unit is to encourage student participation in exercises while simultaneously enhancing and expanding their critical thinking skills. This will be achieved through interactive sessions and lessons, along with engaging students in simple experiments that include sample activities relevant to their interests.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Getting started	Understanding the basics of starting a drawing, user interface, drawing settings (Snap, Rectangular & Isometric grid), limits, units, absolute and relative coordinate systems, Ortho	3	1
2	3	Drawing I, class work1	Familiarization with basic drawing tools: Point (Point Style), line, arc, circle, ellipse, polygon, rectangle, class work1	3	2
3	3	Drawing II, View	Learning viewing tools: zoom, pan, steering wheel, advanced drawing settings (Osnap, Polar snap), polylines, editing lines, erase, selecting elements, line type, line scale	3	3
4	3	Modify I, Drawing III	Drawing modification: copy, rotate, move, zoom, extend, undo, divide, measure	3	4
5	3	Layers, Modify II	Working with layers, element properties, working with grips, alignment	3	5
6	3	Modify III,classwork2	Advanced drawing modifications: array, offset, fillet, chamfer, trim, extend, stretch, mirror, explode, join, separate, classwork2	3	6
7	3	Annotation I, Modify IV, Inquiry	Annotations, text modification, element inquiry: style, text, multiline text, text editing, distance, area, block	3	7
8	3	Quiz	Short quiz	3	8
9	3	Mid Term Exam I	Midterm exam	3	9
10	3	Hatch, Hatch	Hatch commands, hatch	3	10

		edit, Tool Palettes 2	editing, using tool palettes		
11	3	Block I	Creating blocks, inserting blocks, saving blocks, block attributes, block editor, images, drawing order	3	11
12	3	Block II	Parametric constraints, dynamic blocks, tool palettes, exporting images	3	12
13	3	classwork	class work	3	13
14	3	Plot Drawings	Print settings, model space, paper space, multiple viewports, layouts, printing	3	14
15	3	Final Exam	Final Exam	3	15

11. Course Evaluation

1. Daily quizzes: 10%
2. Class assignments: 30%
3. Midterm exam: 10%
4. Final exam: 50% (50)

12. Learning and Teaching Resources

Required textbooks(curricular books any)	Engineering Drawing and Graphic Technology, By: French &Vierk , 12th edition, 1978
Main references (sources)	AutoCAD, 2021
Recommended books and references (scientific journals, reports)	Engineering Drawing, ©2005 by Wuttet Taffesse, Laikemariam Kassa
Electronic references, websites	https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_health_science_students/ engineeringdrawing.pdf

Course Description Form

1. Course Name:
Electrical Circuits Analysis 1
2. Course Code:
CO105
3. Semester/Year:
First semester / First year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
In class / on meet
6. Number of Credit Hours(Total)/Number of Units(Total)
175/7
7. Course administrator's name (mention all, if more than one name)
Name: Dr Ahmed Mamoon Fadhil Email: ahmedalkababji72@uomosul.edu.iq
8. Course Objectives

Course Objectives	• To develop problem solving skills and understanding of circuit theory through the application of techniques. • To understand voltage, current and power from a given circuit. • This course deals with the basic concept of electrical circuits. • This is the basic subject for all electrical and electronic circuits. • To understand Kirchhoff's current and voltage Laws problems

9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	7	An ability to acquire and apply new knowledge and using appropriate learning strategies	Introduction : electrical materials, basic quantities[ch1]	Lecture	Oral exam
2	7	An ability to identify, analyze,	Introduction : electrical materials, basic	Lecture &Lab	Quiz

		and solve complex engineering problems according to principles of engineering, science, and mathematics	quantities[ch1]+quiz		
3	7	Apply Ohm's law and analyze series and parallel resistor circuits, including the ability to perform Y Δ transformations and analyze circuits with dependent and independent sources.	Basic relation: Ohm's law depended and indented sources, series resistor circuits, Y Δ transformation[ch2]	Lecture	Oral exam Home work
4	7	Apply Ohm's law and analyze series and parallel resistor circuits, including the ability to perform Y Δ transformations and analyze circuits with dependent and independent sources.	Basic relation: Ohm's law depended and indented sources, parallel resistor circuits, Y Δ transformation[ch2]+quiz	Lecture &Lab	Quiz
5	7	Apply Kirchhoff's laws to analyze and solve complex electrical circuits, both in DC and AC settings.	Kirchhoff's law.[ch2]	Lecture	Oral exam Home work
6	7	Apply Kirchhoff's laws to analyze and solve complex electrical circuits, both in DC and AC settings.	Kirchhoff's law.[ch2] +quiz	Lecture &Lab	Quiz
7	7	Understand the characteristics of AC signals, including concepts related to	AC signals.[ch8] +quiz	Lecture	Quiz

		frequency, amplitude, phase, and waveform			
8	7		Mid exam		Exam
9	7	Analyze AC circuits with capacitance and inductance, employing appropriate mathematical tools and techniques to calculate voltage, current, and impedance.	AC circuits: capacitance [ch6,ch8] +quiz	Lecture	Quiz Oral exam Home work
10	7	Analyze AC circuits with capacitance and inductance, employing appropriate mathematical tools and techniques to calculate voltage, current, and impedance.	AC circuits: inductance [ch6,ch8] +quiz	Lecture &Lab	Quiz Oral exam Home work
11	7	Understand the characteristics of AC signals, including concepts related to frequency, amplitude, phase, and waveform	Phases.[ch8]	Lecture	Oral exam Home work
12	7	Understand the characteristics of AC signals, including concepts related to frequency, amplitude, phase, and waveform	Phases.[ch8] +quiz	Lecture &Lab	Quiz
13	7	Analyze AC circuits with capacitance and inductance, employing appropriate mathematical tools	AC circuits analysis [ch8,ch9]	Lecture	Oral exam Home work

		and techniques to calculate voltage, current, and impedance			
14	7	Analyze AC circuits with capacitance and inductance, employing appropriate mathematical tools and techniques to calculate voltage, current, and impedance	AC circuits analysis [ch8,ch9] +quiz	Lecture &Lab	Quiz
15	7	all	Preparatory week before the final Exam		
11.					
Quizzes 16%, Onsite Assignments 10%, Projects/Lab 10%, Reports 4%, Midterm Exam 10%, Final Exam 50%.					
12. Learning and Teaching Resources					
Required textbooks(curricular books, if any)			BASIC ENGINEERING CIRCUIT ANALYSIS 10th Ed by J. Irwin		
Main references (sources)					
Recommended books and references (scientific journals, reports)			Textbooks: Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education		
Electronic references, websites					

Course Description Form

1. Course Name:
Physics I
2. Course Code:
CO106
3. Semester/Year:
First Semester/First Class
4. Description Preparation Date:
27/3/2024
5. Available Attendance Forms:
Face to face
6. Number of Credit Hours(Total)/Number of Units(Total)
60 hours and 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Nada Ismaial Email: nada.ismail@uomosul.edu.iq
8. Course Objectives

Course Objectives	Focus on providing students with a comprehensive understanding of semiconductor devices, including diodes and transistors. By achieving these learning outcomes, students will develop the necessary knowledge and skills to analyze and apply these electronic components in various electronic systems and applications.

9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage the students to participate in different activities such as solving questions through critical and logical thinking.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Concepts of Modern Physics	Explain the concepts of modern physics	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
2	4	Semiconductor	Explain the	Explain the	Theoretical

		Materials	semiconductor materials	main concepts face to face through an interactive presentation of the subject	and practical test with written and oral quizzes
3	4	Doping: PN-junction diode	Introduction to PN junction diode	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
4	4	Potential barrier, drift current	Explain the potential barrier and drift current	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
5	4	Depletion layer and capacitor, forward and reverse bias	Explain the Depletion layer and capacitor, forward and reverse bias	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
6	4	Temperature effect on diode characteristics	Explain the Temperature effect on diode characteristics	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
7	4	Mid-term exam	Mid-term exam	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
8	4	Types of diodes 1	Explain the diodes circuits	Explain the main concepts face to face through an interactive	Theoretical and practical test with written and oral quizzes

				presentation of the subject	
9	4	Types of diodes 2	Explain the diodes circuits	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
10	4	Diode Approximations	Explain the diodes circuits	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
11	4	Diodes applications 1	Discussions the applications 1	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
12	4	Diodes applications 2	Discussions the applications 2	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
13	4	Reports seminars	Discussions Reports	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
14	4	Mini projects seminars	Mini projects seminars	Explain the main concepts face to face through an interactive	Theoretical and practical test with written and

				presentation of the subject	oral quizzes
15	4		Review the main concepts before the final test	Review the main concepts before the final test	Theoretical and practical test with written and oral quizzes

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc Quizzes and participation 20% Assignments 10% Report 10% Pre-final test 10% Final theoretical and practical test 50%	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1. فيزياء الإلكترونيات، وكاع الجبوري 2. الخواص الكهربائية والمغناطيسية للمواد، وكاع الجبوري
Main references (sources)	Concepts of Modern Physics, Arthur Beiser, Kent A. Peterson Material Science, Kakani Electronic Devices, Thomas L. Floyd, 10th edition, 2018
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name:
Computer1
2. Course Code:
UOM103
3. Semester/Year:
First / first
4. Description Preparation Date:
30/4/2026
5. Available Attendance Forms:
Lectures
6. Number of Credit Hours(Total)/Number of Units(Total):
75 Hours /3 Units
7. Course administrator's name
Name: Lecturer. Noor mowafeq jabier Email: noor.mowafeq@uomosul.edu.iq
8. Course Objectives

Course Objectives	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.

9. Teaching and Learning Strategies	
Strategy	The main strategy will be adopt in delivering this module is to encourage students' participation in the Lab activities, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, laboratory and by considering type of external search involving some of computer technology that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	An ability to acquire and apply new knowledge and using appropriate learning strategies.	Computers and Operating System	Theory	Exam
2	2	An ability to acquire and apply new knowledge and using appropriate learning strategies.	Computers and Operating System	Theory	Exam Quiz

3	2	An ability to acquire and apply new knowledge and using appropriate learning strategies.	Software and Hardware Interaction	Theory	Exam
4	2	An ability to acquire and apply new knowledge and using appropriate learning strategies.	Software and Hardware Interaction	Theory	Exam
5	2	Getting Started with Excel Essentials, Organizing and Enhancing Worksheets, Creating Formulas and Charting Data.	Windows File Management	Theory	Exam
6	2	Identifying computer operating system and how it works	Operating System Customization	Theory	Exam Assignment
7	2	Identifying computer operating system and how it works	Computer Hardware	Theory	Exam
8	2	Identifying computer operating system and how it works	Computer Hardware	Theory	
9	2		Monthly Lab Exam	Theory	Exam
10	2	Getting Started with Excel Essentials, Organizing and Enhancing Worksheets, Creating Formulas and Charting Data.	Exploring Microsoft Office	Theory	Exam Quiz
11	2	Getting Started with Excel Essentials, Organizing and Enhancing Worksheets, Creating Formulas and Charting Data.	Getting Started with Word Essentials		

12	2	Getting Started with Excel Essentials, Organizing and Enhancing Worksheets, Creating Formulas and Charting Data.	Editing and Formatting Documents	Theory	Exam
13	2	Getting Started with Excel Essentials, Organizing and Enhancing Worksheets, Creating Formulas and Charting Data.	Getting Started with Excel Essentials	Theory	Exam
14	2	Getting Started with Excel Essentials, Organizing and Enhancing Worksheets, Creating Formulas and Charting Data.	Organizing and Enhancing Worksheets	Theory	Exam
15	2	Getting Started with Excel Essentials, Organizing and Enhancing Worksheets, Creating Formulas and Charting Data.	Creating Formulas and Charting Data	Theory	

11. Course Evaluation
2 Quizzes: 15% (15) 1 Assignments: 5% (5) 2 Term Exam: 20% (20) 1 Final Exam: 50% (50)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• 2015 Computer Literacy BASICS: A Comprehensive Guide to IC3 Connie Morrison, Dolores Wells, Lisa Ruffolo Cengage Learning. ISBN: 128576658X • IC3 GS5 Certification Guide Using Windows 10 & Office 2016, Print ISBN: 978-1-55332-463-8

Course Description Form

1. Course Name:
Programing using C++ Language
2. Course Code:
CO108
3. Semester/Year:
Two/ 2025-2026
4. Description Preparation Date:
30-4-2026
5. Available Attendance Forms:
Class/ on line
6. Number of Credit Hours(Total)/Number of Units(Total)
175/ 7
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Prof. Sahar Khalid Ahmed Email: sahar.ahmed@uomosul.edu.iq
8. Course Objectives

Course Objectives	• introduces the students to C++ programming language, which is a starting level for getting into programming. • Gives a holistic view of the C++ Programming language, detailing all the aspects of the C++ language from data types, to operators and expressions • Understand selection statements (if, if-else, switch/-case) for decision making. • Utilize loop statements (for, while, do-while) for repetitive tasks • Understand Arrays. • Understand and utilize structures in C++ programming
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	6	An ability to acquire and apply new knowledge and using appropriate learning strategies	Introduction	Lecture	quiz
2	6	An ability to identify, analyze, and solve engineering problems	Algorithms and Flowcharts	lecture	quiz

3	6	Understand the fundamentals of programming. Demonstrate knowledge of C++ syntax, keywords, and basic program construction principles.	Basic program construction: Keywords, Identifiers, comments, variables, Assignment statements, Input and output Statements.	lecture	Quiz
4	6	Develop competence in constructing arithmetic and logical expressions in C++. Utilize arithmetic operators, logical operators, and relational operators to manipulate data. Create efficient and accurate arithmetic and logical expressions in engineering-oriented software development.	Arithmetic and logical expression: Arithmetic operators, logical operators, relational perators.	Lecture&Lab	Quiz
5	6	Implement control flow structures in C++ programs. Design and implement selection statements (if, if-else, switch/-case) for decision making.	Selection statements: if, if-else, switch..case and ? operator.	Lecture &Lab	quiz
6	6	Implement control flow structures in C++ programs. Design and implement selection statements (if, if-else, switch/-case) for decision making.	Selection statements: if, if-else, switch..case and ? operator.	Lecture &Lab	Assignments
7	6	Utilize loop statements (for, while, do-while)	Loop statements:	Lecture &Lab	quiz

		for repetitive tasks and iteration	for, while, do…while		
8	6	Utilize loop statements (for, while, do-while) for repetitive tasks and iteration	Loop statements: for, while, do…while	Lecture &Lab	Oral exam
9	6	Apply functions, Design and implement user-defined functions to modularize code and improve code reusability.	functions	Lecture	**Assignments**
10	6	Apply functions, Design and implement user-defined functions to modularize code and improve code reusability.	functions	Lecture &Lab	quiz
11	6	arrays, and vectors in C++ programming. Utilize arrays and vectors for efficient data storage and manipulation	Arrays and Vectors	Lecture	Oral exam
12	6	arrays, and vectors in C++ programming. Utilize arrays and vectors for efficient data storage and manipulation	Arrays and Vectors	Lecture &Lab	quiz
13	6		Mid-term Exam		
14	6	Understand and utilize structures in C++ programming	Structures and Structure type functions	Lecture	Oral exam
15	6	Understand and utilize structures in C++ programming	Structures and Structure type functions	Lecture &Lab	quiz
11. Course Evaluation					

Quizzes: 16% (16) Assignments: 4% (4) Lab: 15%(15) Report 5% (5) Midterm Exam 10%(10) Final Exam: 50% (50)			
12. Learning and Teaching Resources			
Required textbooks(curricular books, if any)			
Main references (sources)	1-C++ How to Program, 8/E, Paul Deitel & Harvey Deitel, ©2012 2-The Complete Reference in C++ By Herbert Schildt, 4th edition,2003.		
Recommended books and references (scientific journals, reports)	The Complete Reference in C++ By Herbert Schildt, 4th edition,2003.		
Electronic references, websites			

Course Description Form

1. Course Name:	
Arabic Language1	
2. Course Code:	
UOM1011	
3. Year/Semester	
Second Semester / First Year	
4. Description Preparation Date::	
2026/4/30	
5. Available Attendance Forms :	
In Class	
6. Number of Credit Hours(Total)/Number of Units(Total)	
2/50	
7. Course administrator's name (mention all, if more than one name)	
Omar Hazim Hamid omar.hazim.h@uomosul.edu.iq	
8. Course Objectives :	
The aim of this semester is to enable students to read correctly and to acquire the ability to use language properly in communication with others, including fluency, quality of delivery, and effective expression. It also seeks to develop students' listening skills, enhance their literary appreciation, and train them to use clear and accurate expressions.	Course Objectives
Teaching and Learning Strategies : .9	
The primary aim of Arabic language lessons is to eliminate the difficulty and rigidity that may accompany some of the subjects covered in these lessons, in addition to delivering the required ideas and information to students in ways that are clear and suited to their individual differences. Particular emphasis in the lectures has been placed on Arabic grammar and literature. The course of study is carried out through lectures, examinations, classroom assignments, discussions, and homework.	Strategy

Course Structure .10

Evaluation Method	Learning Method	Unit or Subject Name	Required Learning Outcomes	Hours	Week
		Arabic grammar (Syntax)		2	1
		• Introducing students to the importance of practicing correct writing and speaking in Classical Arabic • Strengthening the student's connection with Arab and Islamic heritage		2	2
		• Introducing students to the different levels of the Arabic		2	3

		language system			
		• Demonstrating the beauty of the Arabic language, the richness of its meanings, and its rhetorical styles		2	4
		• The five verbs		2	5
		• Enabling students to overcome and correct linguistic errors		2	6
		• The past tense and the present tense verbs		2	7
		• The sound masculine plural		2	8
		• Paronomasia (Jinās), antithesis (Ṭibāq), and metaphor (Istiʿārah)		2	9
		• Linguistic errors		2	10
		• Spelling (Orthography)		2	11
		• Literature in the Abbasid era		2	12
		• The poet Al-Mutanabbi		2	13
		• The poet Abu Tammam		2	14
		• The poet		2	15

11. Cou:	
Quizzes	14% (14)
Homework assignments	6% (6)
Seminars and reports	10% (10)
In-class assignments	10% (10)
Midterm examination	10% (10)
Final examination	50% (50) درجة

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Al-Nahw Al-Wafi/Abbas Hassan
Main references (sources)	
Recommended books and references (scientific journals, reports)	Al-Adab Al-Abbasi/ Mohammad Mahdi Al-Basir
Electronic references, websites	

Course Description Form

1. Course Name:					
Mathematics II					
2. Course Code:					
CO110					
3. Semester/Year:					
Second / First					
4. Description Preparation Date:					
30/4/2026					
5. Available Attendance Forms:					
Lectures					
6. Number of Credit Hours(Total)/Number of Units(Total):					
175/7					
7. Course administrator's name					
Name: Dr. Samar Ammar Yasir Email: samarammar@uomosul.edu.iq Name: Dr. Ola Marwan Assim Email: ola.marwan@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	This course 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.				
9. Teaching and Learning Strategies					
Strategy	The main strategy to be adopted in the delivery of this module is to equip students with the skills needed to understand mathematics, specifically in integration, transcendental functions and applications of integration. At the same time, improving and expanding students' thinking skills in strong foundations, mathematical concepts and techniques applied to various disciplines in computer engineering, including optimization, financial mathematics and simulation. This will be achieved through classes and interactive tutorials.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Apply and understandi the fundamental concepts of integration, finite sums	Integration. Formulas for Finite sums. [ch5]	Lecture & Tutorial	Class Exam
2	5	Apply the fundamental concepts of integration, including definite, indefinite integrals and calculate areas under a carve.	Definite and Indefinite Integrals and area under a graph. [ch5]	Lecture & Tutorial	Quiz

3	5	Demonstrate an understanding of the fundamental theorems of integral mathematics and their applications in various mathematical disciplines, such as areas.	Integration by Substitution. The Chain Rule Backward. Area between curves . [ch5]	Lecture & Tutorial	Home work
4&5	10	Apply the fundamental of integration to solve mathematical problems and calculate volumes using several methods.	Volumes of solids of revolution using disk, washer and cylindrical shells methods [ch6]	Lecture & Tutorial	Quiz Home work
6	5	Apply basic concepts of integration to calculate surface areas, and lengths of curves.	Length of curves in the plane and Area of surfaces of revolution [ch6]	Lecture & Tutorial	Home work
7	5	Understand and identify the properties of inverse functions and transcendental functions, including the derivatives and integrals of natural exponential and logarithmic.	Inverse functions [ch1]. The natural logarithmic function. ln(x) and ex The Integrals of tan(x), cot(x),sec(x) and csc(x). Logarithmic Differentiation.[ch7]	Lecture & Tutorial	Class Exam
8	5	Understand and identify the properties of transcendental functions, including the derivatives and integrals of general exponential ex, ax and loga(x).	The derivative and integral natural exponential function. The general expoential ax and logarithmic loga(x) functions and and their derivative and integral.[ch1]+[ch7]	Lecture & Tutorial	Quiz Home work
9	5	Analyze and evaluate the behavior and properties of inverse trigonometric functions, to support mathematical modeling and problem-solving.	Inverse trigonometric functions and their derivative and integral.[ch1]+[ch3]	Lecture & Tutorial	Quiz

10	5	Utilize techniques of integration by using basic integration formulas.	Mid-term Exam Techniques of integration using basic integration formulas. [ch8]	Lecture & Tutorial	Exam
11	5	Utilize techniques of integration, such as integration by parts.	Integration by parts. Tabular integration. [ch8]	Lecture & Tutorial	Quiz
12	5	Apply and use techniques of trigonometric integrals. and solve complex mathematical integration.	Trigonometric integrals.[ch8]	Lecture & Tutorial	Home work
13	5	Utilize partial fractions in rational functions to simplify and solve complex mathematical integration.	Integration of rational functions by partial fractions. [ch8]	Lecture & Tutorial	Class Exam
14	5		Final exam	Tutorial	Exam
15	5	Apply and understandi the fundamental concepts of integration, finite sums	Integration. Formulas for Finite sums. [ch5]	Lecture & Tutorial	Class Exam

11. Course Evaluation
Quizzes: 20% (20) Onsite Assignments: 8% (8) Online Assignments: 8% (8) Reports: 4% (4) Midterm Exam: 10% (10) Final Exam: 60% (60)

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	• Calculus by Thomas and Finny. • Thomas' Calculus: Early Transcendentals 13th Edition by George B. Thomas,2014

Course Description Form

1. Course Name:
Electrical Circuits Analysis 2
2. Course Code:
CO111
3. Semester/Year:
Second semester / First year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
In class / on meet
6. Number of Credit Hours(Total)/Number of Units (Total)
175/7
7. Course administrator's name (mention all, if more than one name)
Name: Dr Ahmed Mamoon Fadhil Email: ahmedalkababji72@uomosul.edu.iq
8. Course Objectives

Course Objectives	• To develop problem solving skills and understanding of circuit analysis theorems through the application of (superposition, source transformation, mesh analysis, Nodal analysis) • To Determine the conditions for maximum power transfer to any circuit element • To understand the importance of transients in RL, RC & RLC. • To understand the principals of Resonant circuits • To understand the principals of Three-phase circuits
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	7	Demonstrate a thorough understanding of circuit analysis theorems underlying Direct Current (DC) and Alternating Current (AC)	Circuit theory: source transformation [ch3,5,8,9]	Lecture	Oral exam

		electrical circuits.			
2	7	Apply circuit analysis theorems (superposition, source transformation, mesh analysis, Nodal analysis)	Circuit theory: superposition [ch3,5,8,9] +quiz	Lecture &Lab	Quiz
3	7	Apply circuit analysis theorems (superposition, source transformation, mesh analysis, Nodal analysis)	Circuit theory: Mesh analysis [ch3,5,8,9]	Lecture	Oral exam Home work
4	7	Apply circuit analysis theorems (superposition, source transformation, mesh analysis, Nodal analysis)	Circuit theory: nodal analysis [ch3,5,8,9] +quiz	Lecture &Lab	Quiz
5	7	Apply Thevenin's& Norton's theorem, maximum power transfer, both in DC and AC.	Circuit theory: thevenin [ch3,5,8,9]	Lecture	Oral exam Home work
6	7	Apply Thevenin's& Norton's theorem, maximum power transfer, both in DC and AC.	Circuit theory: Norton's theorem [ch3,5,8,9] +quiz	Lecture &Lab	Quiz
7	7	Apply Thevenin's& Norton's theorem, maximum power transfer, both in DC and AC.	Circuit theory: maximum power transfer[ch3,5,8,9] +quiz	Lecture	Quiz
8	7		Mid exam		Exam
9	7	Analyse transient responses of RL, RC and RLC for various circuit	Steady-State power Analysis [ch10] +quiz	Lecture	Quiz Oral exam Home work

		configurations			
10	7	Analyse transient responses of RL, RC and RLC for various circuit configurations	Transient circuits: RL circuit's [ch7] +quiz	Lecture &Lab	Quiz Oral exam Home work
11	7	Analyse transient responses of RL, RC and RLC for various circuit configurations	Transient circuits: RC circuit's [ch7]	Lecture	Oral exam Home work
12	7	Analyse transient responses of RL, RC and RLC for various circuit configurations	Transient circuits: RLC circuit's [ch7] +quiz	Lecture &Lab	Quiz
13	7	Get an introduction to Resonant circuits and Three-phase circuits	Resonant circuits [ch11] +quiz	Lecture	Oral exam Home work
14	7	Get an introduction to Resonant circuits and Three-phase circuits	Three –phase circuits [ch11]	Lecture &Lab	Quiz
15	7	all	Preparatory week before the final Exam		

11.	
Quizzes 16%, Onsite Assignments 10%, Projects/Lab 10%, Reports 4%, Midterm Exam 10%, Final Exam 50%.	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	BASIC ENGINEERING CIRCUIT ANALYSIS 10th Ed by J. Irwin
Main references (sources)	
Recommended books and references (scientific journals, reports)	Textbooks: Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education
Electronic references, websites	

Course Description Form

1. Course Name:	
Digital system fundamentals	
2. Course Code:	
CO112	
3. Semester/Year:	
Second / First	
4. Description Preparation Date:	
30/4/2026	
5. Available Attendance Forms:	
In class / On Meet	
6. Number of Credit Hours(Total)/Number of Units(Total):	
175 Hours /7 Units	
7. Course administrator's name	
Name: Asst. Prof. Dr. Shawkat Sabah Khairullah Email: shawkat.sabah@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	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.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Understanding digital logic circuits	Introduction - Digital Logic Fundamentals	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
2	5	Understanding logic gates, truth tables	The Operation of Basic Logic Gates, Truth Table, Logic Function, and Logic Waveform	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
3	5	Understanding	Boolean Algebra	Lecture,	Quiz,Assignment,

		Boolean algebra laws	Laws, Sum of Product (SOP) and Product of Sum (POS) Logic Expressions	Lab, Tutorial	Exam
4	5	Apply properties of Boolean algebra theorems	Proof Theorems by Applying Properties of Boolean Algebra Laws and Truth Tables	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
5	5	Understand the fundamentals of number representation	Number Systems Representation in Digital Computers	Lecture, Tutorial	Quiz,Assignment, Exam
6	5	Understand the fundamentals of number representation	Conversions of Number Systems in Digital Computers	Lecture, Tutorial	Quiz,Assignment, Exam
7	5	Utilize Karnaugh maps as a graphical minimizing tool	Minimization by Karnaugh Maps	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
8	5	Utilize Karnaugh maps as a graphical minimizing tool	Five, Six Variable Karnaugh Map and Multiple Function Minimization	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
9	5	Demonstrate proficiency in design and fabricate digital logic circuits	Mid-term Exam + Implementing Boolean Logic Functions using Multiplexer-based logic	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
10	5	Design and analyze combinational magnitude comparators	Digital Magnitude Comparator Circuits	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
11	5	Design and analyze combinational decoder-encoder	Digital Binary Decoder and Encoder Circuits	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
12	5	Design and analyze combinational adder circuits	Binary Adder and Subtractor Circuit, Half-Adder, Full-Adder, and Ripple	Lecture, Lab, Tutorial	Quiz,Assignment, Exam

			Carry Adder		
13	5	Utilize Karnaugh maps as a graphical minimizing tool	Variable-entered Karnaugh Map and Multiplexer Tree Implementation	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
14	5	Understand the fundamentals of number representation	Unsigned and Signed Numbers representation in Digital Computers	Lecture, Tutorial	Quiz,Assignment, Exam
15	5	All	Preparatory week before the final Exam	Lecture, Lab, Tutorial	Quiz,Assignment, Exam

11. Course Evaluation	
4 Quizzes: 16% 4 Assignments: 8% Lab/Reports: 16% 1 Midterm Exam: 10% 1 Final Exam: 50%	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Digital Fundamentals, 9 th Edition, Thomas L. Floyd, Pearson Prentice Hall, 2006. Digital Design, 5th edition, Morris Mano, Pearson Prentice Hall, 2013.

Course Description Form

Republic of Iraq - Ministry of Higher Education and Scientific Research University of Mosul Bachelor's degree in Computer Engineering (Second cycle) Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr Program Curriculum (2025-2026)	جمهورية العراق - وزارة التعليم العالي والبحث العلمي جامعة الموصل بكالوريوس في هندسة الحاسوب (الدورة الثانية) أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة المنهاج الدراسي للعام 2025-2026

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGII	Three	1	CO201	Mathematics III	رياضيات III	English	4		0				3	63	62	125	5.00	C	CO110
		2	CO202	Analog Electronics	الكترونيات تناظرية	English	3		3				3	93	57	150	6.00	C	CO111
		3	CO203	Microprocessors 1	معالجات دقيقة 1	English	2		3				3	78	72	150	6.00	C	
		4	UOM2022	English Language 2	اللغة الانكليزية 2	English	2		0				3	33	17	50	2.00	B	
		5	CO205	Object Oriented Programing	البرمجة بالكائنات الموجهة	English	2		3				3	78	47	125	5.00	C	CO108
		6	CO206	Programmable Logic Design	تصميم منطق قابل للبرمجة	English	2		3				3	78	72	150	6.00	C	CO112
						Total	15	0	12	0	0	0	18	423	327	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGII	Four	1	CO207	Numerical Analysis	تحليلات عددية	English	2		0		1		3	48	27	75	3.00	C	
		2	CO208	Mathematics IV	رياضيات IV	English	4		0				3	63	62	125	5.00	C	CO201
		3	CO209	Statistics	إحصاء	English	2		0				3	33	17	50	2.00	C	
		4	CO210	Digital Electronics	الكترونيات رقمية	English	2				1		3	48	52	100	4.00	C	
		5	CO211	Microprocessors 2	معالجات دقيقة 2	English	2		3				3	78	72	150	6.00	C	CO203
		6	CO212	Data Structures	هياكل البيانات	English	2		3		1		3	93	57	150	6.00	C	
		7	UOM2050	Baath Regime Crimes in Iraq	جرائم نظام البعث في العراق	Arabic	2						3	33	17	50	2.00	B	
		8	UOM2012	Arabic Language 2	اللغة العربية 2	Arabic	2						3	33	17	50	2.00	B	
						Total	18	0	6	0	3	0	24	429	321	750	30.00		

1. Course Name:
Mathematics III
2. Course Code:
CO201
3. Semester/Year:
third / second year
4. Description Preparation Date:
30/4/2024
5. Available Attendance Forms:
Lectures
6. Number of Credit Hours(Total)/Number of Units(Total):
125 Hours /5 Units
7. Course administrator's name
Name:Dr.Sura NawfalAbdulrazzaq Email: sura.nawfal@uomosul.edu.iq

8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • Understand limits and continuity of multivariable functions • Determine the domain and range and analyze the behavior of multivariable functions • Compute partial derivatives and apply the chain rule • Analyze maximum, minimum, and saddle points in three-dimensional space • Apply double and triple integrals in their different forms • Convert between Cartesian and polar coordinate systems and use them in problem solving • Perform vector operations and apply them in engineering contexts • Represent lines, planes, and spheres using parametric equations • Calculate arc length, curvature, and normal vectors of space curves

9. Teaching and Learning Strategies	
Strategy	The main strategy adopted in teaching this course is to encourage active student participation in solving exercises and in-class activities, while focusing on developing their critical and analytical thinking skills. This will be achieved through theoretical lectures and interactive tutorial sessions, in addition to the use of applied activities and real engineering examples to enhance students' understanding and to link mathematical concepts with practical engineering applications.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understand limits and continuity of multivariable functions	Limits and Continuity	Theory	Exam + Homework
2	2	Determine the	Domain and Range	Theory	Exam +

		domain and range of multivariable functions			Daily Quiz
3	2	Compute partial derivatives and apply the chain rule	Partial Derivatives & Chain Rule	Theory	Exam
4	2	Analyze maximum, minimum, and saddle points	Critical Points in 3D Space	Theory	Exam
5	2	Apply double integrals in Cartesian form	Double Integrals (Cartesian Form)	Theory	Exam + In-class Assignment
6	2	Use polar coordinates in area and length calculations	Applications of Polar Coordinates	Theory	Exam + Homework
7	2	Convert integrals into polar form	Double Integrals (Polar Form)	Theory	Exam + Daily Quiz
8	2	Apply integration techniques to engineering problems	Applications of Integrals	Theory	Exam + In-class Assignment
9	2	Understand triple integrals in Cartesian coordinates	Triple Integrals (Cartesian Coordinates)	Theory	Exam + Seminar
10	2	Apply triple integrals in cylindrical coordinates	Triple Integrals (Cylindrical Coordinates)	Theory	Exam + Daily Quiz
11	2	Apply vector algebra and vector operations	Vectors and Vector Algebra		Exam + Seminar
12	2	Apply dot and cross products	Dot and Cross Product	Theory	Exam + Daily Quiz
13	2	Represent lines, planes, and spheres parametrically	Parametric Equations	Theory	Exam
14	2	Compute arc length and curvature	Arc Length & Curvature	Theory	Exam + Daily Quiz
15	2	Comprehensive review and preparation	Final Exam Preparation	Theory	Exam
11. Course Evaluation					
6 Daily Quizzes: 24% (24 marks) 2 Homework Assignments: 4% (4 marks)					

2 In-class Assignments: 6% (6 marks) 2 Seminars: 6% (6 marks) Midterm Exam: 10% (10 marks) Final Exam: 50% (50 marks) Total: 100% (100 marks)	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• G. B. Thomas, E. Transcendentals, M. D. Weir, J. Hass, and C. Heil, Calculus, 13th edition. 2014. • E. Kreyszig, Advance Engineering Mathematics, 10th edition. 2011. • Bird, John. Understanding engineering mathematics. Routledge, 2014

Course Description Form

1. Course Name:
Analog Electronics
2. Course Code:
CO202
3. Semester/Year:
First Semester/Second Class
4. Description Preparation Date:
30/4/2026
5. Available Attendance Forms:
Face to face
6. Number of Credit Hours(Total)/Number of Units(Total)
75 hours and 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Rabee M. Hagem Email: rabeehagem@uomosul.edu.iq
8. Course Objectives

Course Objectives	Focus on providing students with a comprehensive understanding of electronic components and circuits, including diodes, bipolar junction transistors (BJT), field-effect transistors (FET), operational amplifiers (Op-Amps), and timer circuits. By achieving these learning outcomes, students will develop the necessary knowledge and skills to analyze, design, and apply these electronic devices in various analog systems and applications.

9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this subject is to encourage the students to participate in different activities such as solving questions through critical and logical thinking, and analyzing circuit configurations.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Half-Wave and Full-Wave Rectification, Bridge Rectifier, PIV	Explain Diode Applications: Rectifiers	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes

2	4	Series and Parallel Clippers, Clampers, Voltage Multipliers	Explain Diode Applications: Clippers and Clampers	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
3	4	Zener Characteristics, Voltage Regulation, Zener Limiter	Explain Zener Diode	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
4	4	Construction, Operation, Currents (Alpha & Beta), Configurations (CB, CE, CC)	Explain Bipolar Junction Transistors (BJT)	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
5	4	Load Line Analysis, DC Biasing Configurations	Explain BJT DC Biasing	Explain the main concepts face to face through an interactive presentation of the subject	heoretical and practical test with written and oral quizzes
6	4	Transistor Modeling (re model), Input/Output Impedance, Voltage/Current Gain	Explain BJT AC Analysis	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
7	4	Mid-term exam	Mid-term exam	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
8	4	Multistage configurations, High and Low frequency	Explain Multistage Amplifiers and Frequency Response	Explain the main concepts face to face through an	Theoretical and practical test with written and

		response analysis		interactive presentation of the subject	oral quizzes
9	4	Op-Amp 741, Ideal vs Non-Ideal characteristics, Equivalent Circuit	Explain Operational Amplifiers (Op-Amp)	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
10	4	Inverting, Non-Inverting, Summing, Integrator, Differentiator	Explain Op-Amp Applications	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
11	4	JFET Construction, Characteristics, Transfer Curve, Biasing	Explain Field Effect Transistors (JFET)	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
12	4	Depletion-Type and Enhancement-Type MOSFETs, CMOS	Explain MOSFET Transistors	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
13	4	555 Timer IC Structure, Monostable Operation (One-Shot)	Explain 555 Timer (Oscillator)	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
14	4	Astable Operation (Oscillator), Duty Cycle, Calculations	Explain 555 Timer Applications	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
15	4	Review, Final	Review the main	Review the	Theoretical

		Project Seminars	concepts before the final test	main concepts before the final test	and practical test with written and oral quizzes

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc Quizzes and participation 20% Assignments 10% Report 10% Pre-final test 10% Final theoretical and practical test 50%	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	3. Fundamentals of Microelectronics, Behzad Razavi 4. Microelectronic Circuits, Sedra and Smith
Main references (sources)	Electronic Devices, Thomas L. Floyd, 10th edition, 2018
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name:					
Microprocessor I					
2. Course Code:					
CE203					
3. Semester/Year:					
Second semester/Second year					
4. Description Preparation Date:					
31/3/2024					
5. Available Attendance Forms:					
In class / on meet					
6. Number of Credit Hours (Total)/Number of Units (Total)					
150/6					
7. Course administrator's name (mention all, if more than one name)					
Name: Dr. Mazin Hashim Aziz Email: mazin.haziz@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	The aim of the Microprocessor 1 course is to provide students with a solid understanding of the 8086 architectures, instruction set, machine code, assembly coding, debugging techniques, and the use of INT services, and applying experiments.				
9. Teaching and Learning Strategies					
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	An ability to acquire and apply new knowledge about the microprocessor's history and advances.	Introduction to Microprocessors.	Lecture	Exam
2	5	An ability to describe and discuss the 8086-microprocessor architecture and buses.	The Architecture and Buses of the 8086 Microprocessor.	Lecture & Lab	Quiz, Exam, Lab Report
3	5	An ability to describe and apply memory and input/output addressing modes.	The 8086 Microprocessor's Addressing modes	Lecture & Lab	Assignment, Exam, Lab Report
4	5	Learning the basics of	The 8086	Lecture &	Assignment,

		the microprocessor instructions and the useful tools for applying them.	Microprocessor Instruction set, Debug, and MASM software	Lab	Exam, Lab Report
5	5	Learning and applying the data transfer instructions.	The Data-Transfer instructions' group	Lecture & Lab	Quiz Lab Report
6	5	Learning and applying the logical and shift & rotate instructions.	The Logical and Shift & Rotate instructions' group	Lecture & Lab	Exam, Lab Report
7	5	Learning and applying the branching instructions.	The Loop and Branching instructions' group	Lecture & Lab	Exam, Lab Report
8	5	Learning and applying the arithmetic instructions.	The Arithmetic instructions' group	Lecture & Lab	Assignment, Quiz, Exam
9	5	Applying the previous learning.	Tutorial	Lecture & Lab	Exam, Lab Report
10	5	Learning and applying the string instructions.	The String instructions' group	Lecture & Lab	Exam.
11	5	Learning and applying the logical control instructions.	The Control instructions' group	Lecture & Lab	Assignment, Quiz Lab Report
12	5	The ability to combine the previous knowledge in solving problems by writing assembly codes and applying it.	Writing and executing programs in assembly language	Lecture & Lab	Assignment, Exam, Lab Report
13	5	Understand and apply the use of the BIOS and DOS services.	The BIOS and DOS Interrupts	Lecture & Lab	Quiz, Exam, Lab Report
14	5	Learn the basics of machine coding and the ability to convert between assembly mnemonics and machine codes and vice versa.	Machine language coding	Lecture & Lab	Assignment, Exam
15	5	All	Final Exam Preparation	Theory & Lab	
11. Course Evaluation					
5-Quizzes			10%		
4- Assignments			8%		

4-Lab reports	10%
2- Onsite Assignments	2%
Lab Term Exam	10%
Theory Term Exam	10%
Lab Final Exam	10%
Theory Final Exam	40%
Total	100%
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Walter Triebel and Avtar Singh, The 8088 and 8086 Microprocessors: programming, Interfacing, software, Hardware, Applications, 4th edition, prentice-Hall, 2002.
Main references (sources)	Lectures, experiment manual, and notes
Recommended books and references (scientific journals, reports)	The Intel microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-bit extensions: architecture, programming, and interfacing by: Barry B. Brey—8th ed.
Electronic references, websites	https://classroom.google.com/c/NTM5Mjg0MDE5NTY

Course Description Form

1. Course Name:	
English Language2	
2. Course Code:	
UOM2022	
3. Semester/Year:	
Second Semester / First Year	
4. Description Preparation Date:	
30-4-2024	
5. Available Attendance Forms:	
In class	
6. Number of Credit Hours(Total)/Number of Units(Total)	
30/2	
7. Course administrator's name (mention all, if more than one name) Dr. Basman Mahmood Hasan Alhafidh	
Name: Basman Mahmood Hasan Alhafidh Email: bm.alhafidh@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	This course focuses on building on the language skills and knowledge acquired in previous levels, with the aim of developing students' fluency, accuracy and overall linguistic competence. By the end of the course, students will acquire these skills: 1) Vocabulary Expansion: Enhance students' vocabulary by introducing them to new words, idiomatic expressions, and constructions. This includes both general and subject-specific vocabulary relevant to upper intermediate level. 2) Grammar development: Enhance and expand students' understanding of English grammar. This may involve revisiting and reinforcing previously learned grammatical points and introducing more complex structures and tenses. 3) Reading Comprehension: Improving reading skills through a variety of texts, such as articles, short stories, and excerpts from novels. Students will focus on understanding main ideas, identifying supporting details, and inferring meaning from context. 4) Writing skills: Developing writing abilities through guided exercises and assignments. Students may be encouraged to write essays, reports, letters, or other types of texts, focusing on coherence, consistency, and accuracy. 5) Listening Comprehension: Enhance listening skills through a range of authentic audio materials, including dialogues, interviews and lectures. Students will practice understanding main ideas, specific details, and implicit information. 6) Speaking and Conversation: Encouraging students to express themselves confidently and fluently through various speaking activities. This includes participating in discussions, debates, role-plays and presentations, with an

	emphasis on accuracy, coherence and appropriate use of language. 7) Cultural Awareness: Expand students' understanding of English-speaking cultures and societies through authentic materials and discussions on various topics. This aims to enhance intercultural communication skills and foster a deeper appreciation of diverse viewpoints.
9. Teaching and Learning Strategies	
Strategy	According to the GO4, this course tries to rate student ability to communicate effectively with a range of audiences. Their abilities will be recorded after doing an oral presentation for each student inside the classroom in front of students and the teacher.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	ICE BREAK DAY	ICE BREAK DAY- Getting to know you!	In Class Lecture	daily oral
2	2	Learn about grammar and reading	UNIT 1 Home and Away!: Grammar: Simple, continuous, perfect, active and passive. Reading: Saro's story "Lost and found".	In Class Lecture	Quiz
3	2	Learn conversation for class and speaking style	UNIT 1 Home and Away!: Speaking: Missing words.	In Class Lecture	daily oral and homework
4	2	Learn the art of listening by analyzing and applying synonyms	UNIT 1 Home and Away!: Listening: Things I miss from home. Vocabulary: Compound words.	In Class Lecture	homework
5	2	Learn about grammar and reading	UNIT 2 Been there, got the T-shirt: Grammar: Present perfect simple and continuous. Reading: Our plastic planet.	In Class Lecture	Quiz
6	2	Learn conversation for class and speaking style	UNIT 2 Been there, got the T-shirt: Speaking: Fillers, adding emphasis.	In Class Lecture	homework
7	2	Learn the art of listening by analyzing and applying synonyms	UNIT 2 Been there, got the T-shirt: Listening: Dreams come true. Vocabulary: Hot verbs, make and do.	In Class Lecture	daily oral and homework
8	2	Learn about	UNIT 3 News and Views:	In Class	homework

		grammar and reading	Grammar: Narrative tenses. Reading: Book at bedtime.	Lecture	
9	2	Learn conversation for class and speaking style	UNIT 3 News and Views: Speaking: Giving and receiving news.	In Class Lecture	daily oral
10	2	Learn the art of listening by analyzing and applying synonyms	UNIT 3 News and Views: Listening: The clinging woman. Vocabulary: Books and films	In Class Lecture	daily oral
11	2	Analyze, apply and evaluate what the student has learned during the semester	Review of Chapter 1,2,and 3	In Class Lecture	Quiz
12	2	Evaluation and application of instructions for making reports and presentations	Report presentation for group 1 of students. Each students takes about 5-7 minutes for the test.	In Class Lecture + Online	Class test
13	2	Evaluation and application of instructions for making reports and presentations	Report presentation for group 2 of students. Each students takes about 5-7 minutes for the test.	In Class Lecture + Online	Class test
14	2	Analyze, apply and evaluate what the student has learned during the semester	Midterm Exam	In Class Lecture	Full review
15	2	Final Evaluation	Final Exam	written exams	Pre-final test

11. Course Evaluation	
Quizzes	15
Homework	9
Report and Presentation	16
Pre-Final Test	10
Final Test	50
Total	100

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	
Main references (sources)	SOARS, J. & SOARS, L. 2014. New Headway -Upper - Intermediate Fourth Edition: Student's Book and iTutor Pack, OUP Oxford.

Recommended books and reference (scientific journals, reports)	
Electronic references, websites	https://elt.oup.com/student/headway/upper/intermediate/?cc=us&selLanguage=en

Course Description Form

1. Course Name:
Object Oriented Programming
2. Course Code:
CO205
3. Semester/Year:
Third Semester / Second Year
4. Description Preparation Date:
2026/4/30
5. Available Attendance Forms:
On-campus / Blended
6. Number of Credit Hours(Total)/Number of Units(Total)
5 ECTS / 125 Hours
7. Course administrator's name (mention all, if more than one name)
Asst. Prof. Dr. Turkan Ahmed Khaleel Email: turkan@uomosul.edu.iq Asst. Prof. Sahar Kalid Ahmed Email: sahar.ahmed@uomosul.edu.iq
8. Course Objectives

Course Objectives	The course aims to introduce students to the fundamentals of object-oriented programming using C++, and to develop their skills in designing software using concepts such as objects, encapsulation, inheritance, and polymorphism, as well as building reusable and maintainable applications.

9. Teaching and Learning Strategies	
Strategy	Lectures, laboratory sessions, collaborative learning, programming projects, problem-solving, and software design using object-oriented programming.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understand basic concepts	Introduction	Lecture	Quiz
2	2	Understand objects	Objects	Lecture	Assignment
3	2	Apply abstraction	Data Abstraction	Lecture + Lab	Lab Assessment
4	2	Understand encapsulation	Encapsulation	Lab	Quiz
5	2	Create objects	Constructors	Lecture	Assignment
6	2	Use methods	Methods	Lab	Lab Assessment
7	2	Apply overloading	Method Overloading	Lecture	Quiz

8	2	Apply inheritance	Inheritance	Lecture + Lab	Midterm Exam
9	2	Apply polymorphism	Polymorphism	Lecture	Quiz
10	2	Understand abstract classes	Abstract Classes	Lab	Assignment
11	2	Understand abstract methods	Abstract Methods	Lecture	Quiz
12	2	Apply exception handling	Exception Handling	Lab	Lab Assessment
13	2	Develop project	Project	Lecture	Project
14	2	General review	Revision	Discussion	Continuous Assessment
15	2	Comprehensive evaluation	Final Exam	Exam	Final Exam

11. Course Evaluation	
Quizzes	9%
Assignments	6%
Lab	15%
Project	10%
Midterm Exam	10%
Final Exam	50%
Total	100%

12. Learning and Teaching Resources	
Required textbooks(curricular books, if ar	[1] R. Lafore, Object-Oriented Programming in C++, 4th ed., Sams Publishing, 2002.
Main references (sources)	[2] C++ Programming: An Object-Oriented Approa 2022.
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name:	
Programmable logic design	
2. Course Code:	
CO206	
3. Semester/Year:	
Third / Second	
4. Description Preparation Date:	
30/4/2026	
5. Available Attendance Forms:	
In class / On Meet	
6. Number of Credit Hours(Total)/Number of Units(Total):	
150 Hours /6 Units	
7. Course administrator's name	
Name: Asst. Prof. Dr. Shawkat Sabah Khairullah Email: shawkat.sabah@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: ssinstruct 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.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Synchronous and Asynchronous Circuit Models	Sequential Logic Design: Synchronous and Asynchronous Circuit Models,	Lecture, Lab, Tutorial	Quiz, Assignment, Exam

			Latch and Flip-Flop		
2,3	2	Understanding Programmable Logic Devices	Introduction to Programmable Logic Devices	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
4,5	2	Understanding Programmable Logic Devices	Taxonomy of Programmable Logic Devices Technologies	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
6,7	2	develop a solid understanding of PLD devices	Implementing Logic Functions using PLDs	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
8	2	develop a solid understanding of PLD devices	Basic principles of Programmable digital devices PAL, PLA, CPLD review	Lecture, Tutorial	Quiz,Assignment, Exam
9	2	understand the hazard in combinational logic circuits	Hazards in Combinational Logic Circuits	Lecture, Tutorial	Quiz,Assignment, Exam
10	2	develop a solid understanding of FPGA devices	FPGA structure	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
11	2	study concepts of VHDL	VHDL Language	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
12	2	study concepts of VHDL	Circuit Design in VHDL	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
13	2	study concepts of VHDL	Code structure of VHDL	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
14	2	study sequential concepts of VHDL	Sequential statement of VHDL	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
15	2	study state machine concepts of VHDL	State machine of VHDL	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
11. Course Evaluation					
4 Quizzes: 16% 4 Assignments: 8% Lab/Reports: 16% 1 Midterm Exam: 10% 1 Final Exam: 50%					

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• Modern digital design by Richard S. Sandige (McGraw-Hill) • Voinci A. pedroni, "Circuit design with VHDL", MIT press, Cambridge, London 2004. • Thom A.S. "digital with CPLA application and VHDL. • Introduction to Logic Design, 3rd edition, Alan Marcovitz, McGraw-Hill, 2010.

Course Description Form

1. Course Name:
Numerical Analysis
1. Course Code:
CE207
2. Semester/Year:
Semester 4 / Year 2
3. Description Preparation Date:
2026/4/30
4. Available Attendance Forms:
Lectures
5. Number of Credit Hours(Total)/Number of Units(Total)
30/3
6. Course administrator's name (mention all, if more than one name)
Name: Dr. Ina'am Fathi Khudher Email: inam.fathi@uomosul.edu.iq
7. Course Objectives

Course Objectives	On successful completion of this course students will be able to: 1. List theories and concepts used in Numerical Analysis. 2. Classifying the numerical techniques to compute approximate solutions of linear and nonlinear equations and differential equations. 3. Apply numerical techniques for interpolation, differentiation quadrature problems. 4. Analyze errors arising in numerical computation of solutions to mathematical and applied problems and execute some problems. 5. Compare results for numerical root finding methods.
8. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Numerical Methods basics	Introduction to Numerical Methods	Theory	Exam
2	3	Introduction to Data and error Analysis	Data and error Analysis	Theory	Exam Quiz
3	3	Concepts and role for the numerical method in	numerical method in engineering, approximations, and	Theory	Exam Assignment

		engineering, approximations, and errors, the definition of Round-off error and truncation error, absolute and relative true/approximation error	errors.		
4	3	Introduction to non- linear Data Analysis	Numerical Methods for non- linear Data Analysis	Theory	Exam Quiz
5	3	Roots of Equations: Bracketing Methods Graphical, Bisection, and False-Position method).	Numerical Solution of Nonlinear Algebraic Equations	Theory	Exam Quiz
6	3	Introduction to Numerical Methods for linear Data Analysis	Numerical Methods for linear Data Analysis	Theory	Exam
7	3	the difference between the direct and indirect methods, Singular and ill/well-conditioned system, Partial and complete Pivoting, Convergence Criteria, Jacobi iterative method	Numerical Solution of linear algebraic equations (system).	Theory	Exam
8	3	Simple fixed-point iteration and Newton-Raphson and secant methods.	Open Methods	Theory	Exam Assignment
9	3	The gauss-Seidel iterative method, Gauss-Seidel iterative with the	The gauss-Seidel method	Theory	Exam

		relaxation factor method. Tri-diagonal systems and its solution.			
10	3	Introduction to Interpolation and extrapolation	Interpolation and extrapolation	Theory	Exam Quiz
11	3	The cubic version of Lagrangian Interpolation, cubic spline Interpolation (Cheney and Kincaid Formula). Tri-diagonal systems and its solution	The Lagrangian Interpolation	Theory	Exam
12	3	Introduction to Numerical integration	Numerical integration	Theory	Exam
13	3	Introduction to Numerical differentiation	Numerical differentiation	Theory	Exam Report
14	3	Introduction to Regression	Regression	Theory	Exam
15	3		Term Exam	Theory	

10. Course Evaluation	
4 Quizzes: 24% (24) 2 Assignments: 10% (10) 1 Report: 6% (6) Midterm Exam: 10% (10) Final Exam: 50% (50)	
11. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	
Main references (sources)	• Numerical Analysis Using Matlab and Excel, Steven T. Karris. • Applied Numerical Methods with MATLAB® for Engineers and Scientists, Steven C. Chapra, Fourth Edition, 2017.
Recommended books and references (scientific journals, reports)	• Leader, Jeffery J. Numerical analysis and scientific computation. CRC Press, 2022. • Numerical Analysis Using Matlab and Excel,

	Steven T. Karris, Third Edition, 2007.
Electronic references, websites	

Course Description Form

1. Course Name:	
Mathematic IV	
2. Course Code:	
CE208	
3. Semester/Year:	
second/second level	
4. Description Preparation Date:	
30\4\2026	
5. Available Attendance Forms:	
class lecture	
6. Number of Credit Hours(Total)/Number of Units (Total) 60 /unit?	
125 hr./ 5 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Warqaa Younis Ibraheem Email: warqaa.younis@uomosul.edu.iq Name: Noor Mowafeq Email: noor.mowafeq@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	• State and define the Laplace transformations and its properties and applications to differential equations. In addition to memorize the differential equations methods. • Select appropriate procedures & techniques in solving Laplace transform problems. (Ability to choose appropriate procedures and techniques to solve the differential equations) explain the concept of differential equation. Classifies theses equations with respect to their order, type and linearity. • Apply mathematical methods and concepts to evaluate and solve real-world problems, like electrical circuits, harmonic oscillators, and mechanical systems (Ability to solve and analyze differential equations). Solve the linear and non-linear differential equations 1st order and higher order equations. • Compare and e examine the results when using different methods to solve the problems. like separable, exact, linear, homogeneous. • Show the ability to perform and cooperate in group work. (Team Working).
9. Teaching and Learning Strategies	
Strategy	This course gives the students the ability to solve and investigate the differential equations using different methods, all types of differential equations will 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.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1,2	8	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	Introduction to Laplace transform, Laplace transform properties and application.	Class Lecture	1st Quiz
3	4	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	Laplace Inverse Transform, Laplace transform of unit step function..	Class Lecture	Classwork
4,5	8	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	1st Shifting theorem (Translation in S-domain), 2nd Shifting theorem (Translation in Time) , Convolution Theorem..	Class Lecture	2nd Quiz
6,7	8	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	Solution of Differential Equations by Laplace Transformation and Laplace transform applications	Class Lecture	3rd Quiz
8	4	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	Definition and Classification of differential equation DE (ordinary and partial, order, degree, Linear and non-linear).	Class Lecture	Classwork
9	4	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	Solutions of differential equations (general and particular solutions).	Class Lecture	Mid-term exam
10,11	8	An ability to distinguish,	1st order ordinary DEs	Class	classwork

		identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	(Linear ,separable homogeneous, exact)	Lecture	
12,13	8	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	Initial value problems, Boundary values problems of 2^{nd} ODEs. 2^{nd} order ordinary DEs(Linear 2^{nd} order DEs with constant coefficients) auxiliary equation	Class Lecture	Summery exam
14	4	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	solution of Non-homogeneous differential equation(Inspired Guessing), Non homogenous linear equation, Undetermined Coefficients method	Class Lecture	Classwork
15	4	An ability to distinguish, identify, define formulate, and solve engineering problems by applying principles of engineering ,science and mathematic	2^{nd} order DEs with Variable of parameter method, variable coefficients , summery test	Class Lecture	4th Quiz
11.					
4 Quizes(8) 8 % : 3 homework) 8% 8(\3 classwork) 8%8(reports(6) 6% 1 midexam%20) 20((50) 50 %final exam1					
12. Learning and Teaching Resources					
Required textbooks(curricular books, if any)					
Main references (sources)			[1] G. B. Thomas, E. Transcendentals, M. D. Weir, J. Hass, and C. Heil, *Calculus*, 13^{th} edition. 2014. [2] E. Kreyszig, *Advance Engineering Mathematics*, 10^{th} edition. 2011.		
Recommended books and references (scienti journals, reports)					

Electronic references, websites	[1] G. B. Thomas, E. Transcendentals, M. D. Weir, J. Hass, and C. Heil, *Calculus*, 13th edition. 2014. [2] E. Kreyszig, *Advance Engineering Mathematics*, 10th edition. 2011.

Course Description Form

1. Course Name:	
Statistics	
2. Course Code:	
ENGC227	
3. Semester/Year:	
Second/first	
4. Description Preparation Date:	
30/4/2026	
5. Available Attendance Forms:	
Physical attendance	
6. Number of Credit Hours(Total)/Number of Units(Total)	
2	
7. Course administrator's name (mention all, if more than one name)	
Name: amar daood Email: amar.daood@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	● Learn all principles and basics of the statistics. ● Be familiar with the Descriptive and Inferential statistics. ● understand Concepts of Probability Theory.
9. Teaching and Learning Strategies	
Strategy	1- Apply knowledge of mathematics, science, and engineering. 2- Learn all basic mathematical of statistics and probability. 3- The student should be able to understand and analyze dataset.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1,2	2	Learn basic of statistics	Role of statistics in science, types of statistics (Descriptive and Inferential), data presentation (Arithmetic mean, Median, Mode).	lecture	Oral Exam
3,4	2	Learn types of statistics	Descriptive statistics, histogram frequency distribution, data limits, data tabulations, polygon, ogive.	lecture	Oral Exam Homework

4,5	2	Understand the basic of probability	Basic Concepts of Probability Theory (random events and sample space), relationship between statistics and probability.	lecture	Homework
6,7	2	Review sets and their operations and rules	Sets and probabilistic models, axioms of probability, rule of Probability	lecture	Quiz
8	2	Learn definition of conditional probability	The definition of conditional probability and their properties	lecture	Oral Exam
9	2	Understand Multiplication rule, total probability theorem, Bayes' theorem	Multiplication rule, total probability theorem, Bayes' theorem	lecture	Oral Exam
10	2	Learn Three events, mutually and non-mutually events	Three events, mutually and non-mutually events	lecture	Quiz
11	2	Learn Counting	Counting, permutation, combination	lecture	Homework
12	2	Understand random variable	The definition and classification of random variable (Discrete and Continuous), type of discrete distribution.	lecture	Exam
13	2	Learn Discrete distributions	Discrete probability distributions, Binomial and Poisson Distribution.	lecture	Homework
14	2	Learn Continuous distribution	Continuous distribution, normal distribution	lecture	Oral Exam Quiz
15			Final exam		

. Course Evaluation

2 quizzes	5pts
1 onsite assignment	2pts

2 online assignment	3pts
Projects	5pts
Term Exam	25pts
Final Exam	60pts
Total	100pts

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Introduction to Probability and Statistics for Engineers, Holický, Milan
Main references (sources)	Introduction to Statistics, K. M. AL_Rawi, Second Edition
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description

1. Course Name:	
Digital Electronics	
2. Course Code:	
CO210	
3. Semester/Year:	
Fourth/ Second	
4. Description Preparation Date:	
5/4/2026	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
45 Hours /4 Units	
7. Course administrator's name	
Name: lec. modhar ahmed hammoudy Email: modharhammoudy @uomosul.edu.iq	
8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • Understanding of digital electronics principles and develop problem solving skills • Understand the importance of noise margins and the principles of figure of merits • Determine the static power consumption and fan-out of any gate • Analyze various digital logic circuits
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Monitoring the figure of merit of the logic gates types	Introduction to digital electronics and the digital IC characteristics	Theory	Exam
2	2	Naming all the Families (Types) of digital electronics circuits and the different between them	Resistor diode logic RDL	Theory	Exam

3	2	Using the basic concepts of electrical and electronic analysis to determine the power consumption, number of load circuits and the logic voltage levels for the logic gate	Resistor transistor logic RTL	Theory	Exam
4	2	determine the power consumption, number of load circuits and the logic voltage levels for the logic gate	Diode transistor logic DTL	Theory	Exam
5	2	determine the power consumption, number of load circuits and the logic voltage levels for the logic gate	Transistor transistor logic TTL	Theory	Exam Quiz
6	2	determine the power consumption, number of load circuits and the logic voltage levels for the logic gate	Emitter coupled logic ECL , I2L	Theory	Exam H.W
7	2	Naming all the Families (Types) of digital electronics circuits	The Field effect transistror FET	Theory	Exam
8	2	determine the logic voltage levels for the logic gate	MOSFET logic circuits design and analysis	Theory	Exam
9	2	Naming the different between the digital electronics circuits	NMOS and PMOS logic circuits	Theory	Exam
10	2	Naming the different between the digital electronics circuits	Complementary Metal Oxide CMOS logic circuits	Theory	Exam Quiz
11	2	determine the logic voltage levels for the logic gate	Complementary Metal Oxide CMOS logic circuits	Theory	Exam H.W
12	2	Naming the different	Sequential MOS logic	Theory	Exam

		between the digital electronics circuits families	circuits		
13	2	Naming the different between the digital electronics circuits families	Regenerative logic circuits	Theory	Exam
14	2	Naming the different between the digital electronics circuits families	Semiconductor memories	Theory	Exam
15	2		Term Exam	Theory	

11. Course Evaluation
2 Quizzes: 8% (8) 1 Assignments: 2% (2) 2 Term Exam: 30% (30) 1 Final Exam: 60% (60)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• Analysis and Design of Digital Integrated Circuits" by: David A. Hodges. 1988 • "Digital Integrated Circuits Analysis and Design" by: John E. Ayers.2004

Course Description Form

1. Course Name:
Microprocessor II
2. Course Code:
CE211
3. Semester/Year:
Second semester/Second year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
In class / on meet
6. Number of Credit Hours (Total)/Number of Units (Total)
150/6
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Mazin Hashim Aziz Email: mazin.haziz@uomosul.edu.iq
8. Course Objectives

Course Objectives	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.

9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	An ability to acquire and apply new knowledge about the microprocessor's address decoding principles and design.	The 8086 Microprocessor's address decoding.	Lecture	Exam

2	5	An ability to acquire and apply new knowledge about the memory interface basics and design.	The 8086 Microprocessor's memory interface.	Lecture & Lab	Quiz, Exam, Lab Report
3	5	An ability to acquire and apply new knowledge about the input/output interfacing principles and design.	The Basic Input / Output Interfaces to the 8086 Microprocessor.	Lecture & Lab	Assignment, Exam, Lab Report
4	5	Learning the basics of the 8x86 microprocessors register development.	The 8X86 Registers (16, 32, and 64-bits).	Lecture & Lab	Assignment, Exam, Lab Report
5	5	Learning the basics of the protected mode and other microprocessor operating modes.	Introduction to Protected Mode.	Lecture & Lab	Quiz Lab Report
6	5	Learning the principles of memory segmentation and paging.	Memory segmentation and paging.	Lecture & Lab	Exam, Lab Report
7	5	Learning the basics of math coprocessors.	Math Co-processor: Introduction.	Lecture & Lab	Exam, Lab Report
8	5	Learning and applying the math coprocessor different data formats.	Math Co-processor: Data Formats.	Lecture & Lab	Assignment, Quiz, Exam
9	5	Learning the math coprocessor architecture.	Math Co-processor: 80x87 Architecture.	Lecture & Lab	Exam, Lab Report
10	5	Applying math data type transfer.	Tutorial.	Lecture & Lab	Exam.
11	5	Learning the math coprocessor instruction set.	Math Co-processor: Instruction Set.	Lecture & Lab	Assignment, Quiz Lab Report

12	5	Learning an introduction to the MMX technology.	MMX Technologies.	Lecture & Lab	Assignment, Exam, Lab Report
13	5	Understand the advances in 8x86 microprocessor's architectures.	Introduction to 8X86 Microprocessors' architectures (1).	Lecture & Lab	Quiz, Exam, Lab Report
14	5	Analyze the differences between 8x86 microprocessor's architectures.	Introduction to 8X86 Microprocessors' architectures (2).	Lecture & Lab	Assignment, Exam
15	5	All	Final Exam Preparation	Theory & Lab	

11. Course Evaluation	
5-Quizzes	10%
4- Assignments	8%
4-Lab reports	10%
2- Onsite Assignments	2%
Lab Term Exam	10%
Theory Term Exam	10%
Lab Final Exam	10%
Theory Final Exam	40%
Total	100%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Walter Triebel and Avtar Singh, The 8088 and 8086 Microprocessors: programming, Interfacing, software, Hardware, Applications, 4th edition, prentice-Hall, 2002.
Main references (sources)	Lectures, experiment manual, and notes
Recommended books and references (scienti journals, reports)	The Intel microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-bit extensions: architecture, programming, and interfacing by: Barry B. Brey—8th ed.
Electronic references, websites	https://classroom.google.com/c/NTM5Mjg0MDE5NTY

Course Description Form

1. Course Name:
Data Structures
2. Course Code:
CO212
3. Semester/Year:
Fourth Semester / Second Year
4. Description Preparation Date:
2026/4/30
5. Available Attendance Forms:
On-campus / Blended
6. Number of Credit Hours(Total)/Number of Units(Total)
6 Credits / 150 Hours
7. Course administrator's name (mention all, if more than one name)
Asst. Prof. Dr. Turkan Ahmed Khaleel Email: turkan@uomosul.edu.iq
8. Course Objectives

Course Objectives	The course introduces data structures and algorithms, focusing on design, implementation, and efficiency analysis.

9. Teaching and Learning Strategies	
Strategy	Lectures, labs, collaborative learning, projects, and problem solving.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understand basic data structure concepts	Introduction + Arrays	Lecture	Quiz
2	2	Apply recursion	Recursion	Lecture + Exercises	Assignment
3	2	Understand and implement stacks	Stacks (Array)	Lecture + Lab	Lab Assessment
4	2	Use stacks in applications	Stacks (Linked List)	Lab	Quiz
5	2	Understand queues	Queues (Array)	Lecture	Assignment
6	2	Apply queues	Queues (Linked List)	Lab	Lab Assessment
7	2	Understand trees	Trees Basics	Lecture	Quiz
8	2	Apply binary trees	Binary Trees	Lab	Assignment
9	2	Understand graphs	Graphs	Lecture	Quiz

10	2	Apply hashing	Hashing	Lecture + Lab	Midterm Exam
11	2	Analyze sorting algorithms	Sorting	Lecture	Assignment
12	2	Apply searching algorithms	Searching	Lab	Lab Assessment
13	2	Analyze complexity	Complexity Analysis	Lecture	Project
14	2	General review	Revision	Discussion	Continuous Assessment
15	2	Comprehensive evaluation	Final Exam	Exam	Final Exam

11. Course Evaluation	
Quizzes	9%
Assignments	6%
Lab	15%
Project	10%
Midterm Exam	10%
Final Exam	50%
Total	100%

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	[1] D. S. Malik, Data Structures Using C++, 2nd ed. Boston, MA, USA: Cengage Learning, 2012
Main references (sources)	[2] M. A. Weiss, Data Structures and Algorithm Analy in C++, 4th ed. Boston, MA, USA: Pearson, 2014.
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name :
Baath Regime Crimes in Iraq
2. Course Code :
UOM2050
3. Semester/Year :
Second Semester / Second Year
4. Description Preparation Date::
2026/4/30
5. Available Attendance Forms :
In Class
6. Number of Credit Hours(Total)/Number of Units(Total)(:
2/50
7. Course administrator's name (mention all, if more than one name)
الاسمWisam Jamal : الايميلwisam.jamal@uomosul.edu.iq :

Course Objectives : .8

• Educating students about the crimes committed by the Ba'ath regime in Iraq. Guiding students to become familiar with crimes and their various forms.	Course Objectives

Teaching and Learning Strategies : .9

The main strategy to be adopted in delivering this course unit is to encour students' participation in exercises while simultaneously refining and expand their critical thinking skills.	Strategy

Course Structure .10

Evaluation Method	Learning Method	Unit or Subject Name	Required Learning Outcomes	Hours	Week
		The concept of crimes and their Types		2	1
		Types of in trinational crimes		2	2
		Political crime Exam		2	3
		Social Crime		2	4
		The crime of suppressing		2	5
		the Shaaban uprising		2	6
		Psychological crimes of the baath		2	7
		Regime of disrupting Friday		2	8
		Prayers Mass grave crimes		2	9
		Chemical attack on Haiabja		2	10
		Use of internationally		2	11
		Exam		2	12

		Environmental crimes of the baath regime in Iraq		2	13
		Incidents of cemeteries and genocide committed dy the Baathist regime in Iraq		2	14
		Final Exam		2	15

.11 Course Evaluation :	
Quizzes	20% (20)
Homework assignments	7% (7)
In-class assignments	7% (7)
Report	6% (6)
Midterm examination	10% (10)
Final examination	50% (50) درجة

.12 Learning and Teaching Resources	
quired textbooks(curricular books, if any)	The textbook on the crimes of the Ba'ath regime in Iraq, issued by the Ministry of Higher Education and Scientific Research
Main references (sources)	
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name :
Arabic Language 2
2. Course Code :
UOM2012
3. Semester/Year :
Second Semester / Second Year
4. Description Preparation Date :
2026/4/30
5. Available Attendance Forms :
In Class
6. Number of Credit Hours(Total)/Number of Units(Total)
2/50
7. Course administrator's name (mention all, if more than one name)
Omar Hazim Hamid omar.hazim.h@uomosul.edu.iq
8. Course Objectives :

The aim of this semester is to enable students to read correctly and to acquire the ability to use language properly in communication with others, including fluency, quality of delivery, and effective expression. It also seeks to develop students' listening skills, enhance their literary appreciation, and train them to use clear and accurate expressions.	Course Objectives
9. Teaching and Learning Strategies :	
The primary aim of Arabic language lessons is to eliminate the difficulty and rigidity that may accompany some of the subjects covered in these lessons, in addition to delivering the required ideas and information to students in ways that are clear and suited to their individual differences. Particular emphasis in the lectures has been placed on Arabic grammar and literature. The course of study is carried out through lectures, examinations, classroom assignments, discussions, and homework.	Strategy

10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
1	2		• Arabic grammar (Syntax)		
2	2		• Introducing students to the importance of practicing the rules of writing and speaking in Classical Arabic • Strengthening the student's connection with Arab heritage		
3	2		• Introducing students to the different levels of the Arabic language system		

		• Promoting scientific research in the field of the Arabic language and its sciences through the preparation of studies and research		2	4
		• Demonstrating the beauty of the Arabic language, the richness of its meanings, and its rhetorical styles •		2	5
		• Enabling students to overcome and correct linguistic errors		2	6
		• *Ẓanna* and its related verbs		2	7
		• Accusative nouns		2	8
		• The absolute object (*Al-Maf'ul Al-Mutlaq*)		2	9
		• Linguistic errors		2	10
		• Spelling (Orthography)		2	11
		• Literature in the Abbasid era		2	12
		The Poet Al-Mutanabbi		2	13
		The Poet Abu Tammam		2	14
		The Poet Abu Firnnas Al Hamdani		2	15

11. تقييم المقرر:

15% (15)	**Quizzes**
10% (10)	**H.W Assignments**
5% (5)	**Seminars/Reports**
10% (10)	**On-site Assignment**
10% (10)	**Midterm Exam**
50% (50) درجة	**Final Exam**

12. Learning and Teaching Resources

Adequate Grammar / Abbas Hassan	Required textbooks(curricular boo if any)
	Main references (sources)
In Abbasid Literature / Muhammad Mahdi A Basir	Recommended books and references (scientific journals, reports)
	Electronic references, websites

Republic of Iraq - Ministry of Higher Education and Scientific Research
University of Mosul
Bachelor's degree in Computer Engineering (Second cycle)
Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr
Program Curriculum (2025-2026)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة الموصل
بكالوريوس في هندسة الحاسوب (الدورة الثانية)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة
المنهاج الدراسي للعام 2025-2026

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w	Lab (hr/w	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGIII	Five	1	CO301	Data Communications	اتصالات البيانات	English	3		3				3	93	57	150	6.00	C	
		2	CO302	Mathematics V	رياضيات V	English	4		0				3	63	87	150	6.00	C	
		3	CO303	Computer Architecture 1	معمارية الحاسوب 1	English	3		0				3	48	77	125	5.00	C	
		4	CO304	Embedded Systems	الانظمة المضمنة	English	2		3				3	78	47	125	5.00	C	
		5	CO305	Operating Systems	انظمة تشغيل	English	2		3				3	78	47	125	5.00	C	
		6	CO306	Artificial Intelligence Fundamentals	أساسيات الذكاء الاصطناعي	English	2		0				3	33	42	75	3.00	C	
						Total	16	0	9	0	0	0	18	393	357	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w	Lab (hr/w	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Six	1	CO307	Computer Networks	شبكات الحاسوب	English	3		3				3	93	32	125	5.00	C	
		2	CO308	Digital Signal Processing	معالجة الاشارة الرقمية	English	3		0				3	48	52	100	4.00	C	CO302
		3	CO309	Computer Architecture 2	معمارية الحاسوب 2	English	3		0				3	48	77	125	5.00	C	CO303
		4	CO310	Mathematics VI	رياضيات VI	English	4		0				3	63	112	175	7.00	C	
		5	CO311	Physics II	فيزياء II	English	4		0				3	63	112	175	7.00	C	
		6	CO312	Engineering Project Design and Planning	تصميم وتخطيط المشروع الهندسي	English	2						3	33	17	50	2.00	S	
						Total	19	0	3	0	0	0	18	348	402	750	30.00		

Course Description Form

1. Course Name:	
Data Communications	
2. Course Code:	
CE301	
3. Semester/Year:	
Five / Third	
4. Description Preparation Date:	
31/03/2024	
5. Available Attendance Forms:	
In class / on meet	
6. Number of Credit Hours(Total)/Number of Units(Total)	
150/6	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Salah Abdulghani Email: eng.salah@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	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.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Identify and describe the basics of Data Communications	Introduction to Data Communications and Underlying Technologies	Lecture & LAB	Quiz & Oral exam
2	3	Identify and describe the OSI Model and the TCP/IP Protocol Suite	The OSI Model and the TCP/IP Protocol Suite	Lecture & LAB	Quiz
3 & 4	6	Identify and describe the Data and Signal Transmission	Data and Signal Transmission	Lecture	Oral exam Home work
5 & 6	6	Identify, describe, explain and and compare with various types of analogue and digital transmission	Analogue and Digital Transmission	Lecture	Oral exam Home work
7 & 8	6	Identify and describe the Bandwidth Utilization, and Multiplexing	Bandwidth Utilization, Multiplexing	Lecture & LAB	Exam
9 & 10	6	Identify and describe Circuit-Switched and Packet networks	Switching (Circuit-Switched and Packet networks)	Lecture	Quiz
11 & 12	6	Identify and describe the Data Link Control	Data Link Control (DLC) , Flow and Error Control Mechanisms	Lecture	Oral exam Home work
13 & 14	6	Identify and describe the Multiple Access Links and Protocols	Multiple Access Links and Protocols	Lecture & LAB	Oral exam Home work
15	3	Identify and	Error Detection and	Lecture	Exam

		describe the Error Detection and Correction	Correction		

11. Course Evaluation		
Quizzes	**20% (20)**	**4**
Assignments	**10% (10)**	**2**
Report/Lab	**10% (10)**	**5**
Midterm Exam	**10% (10)**	**3 hr**

12. Learning and Teaching Resources	
Required textbooks(curricular boo if any)	Behrouz A. Forouzan, "Data communication and Networking", Fifth Edition, Tata McGraw – Hill,2015. Cory Beard and William Stallings, "Wireless Communication Networks and Systems" (ISBN: 0133594173, available online
Main references (sources)	James F. Kurose, Keith W. Ross, "Computer Networking – A Top-Down Approach Featuring the Internet", seventh Edition, Pearson Education, 2016.
Recommended books and referenc (scientific journals, reports)	-----
Electronic references, websites	-----

Course Description Form

1. Course Name:	
Mathematics V	
2. Course Code:	
SISY302	
3. Semester/Year:	
first / third	
4. Description Preparation Date:	
5/4/2024	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
30 Hours /4 Units	
7. Course administrator's name	
Name: Asst. Zahraa talal Abed Email: zahraatalal@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • 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, and converting signals from analogue to digital formula. • To Applying the fundamental Digital Convolutional theories and De-convolution theories on digital signals. • To apply real and complex Fourier series . • To Solve difference equation based on Frequency response of digital function • To understand and solve the theories 1D-FT theory. • To understand and solve the theories 1D-DTFT theory.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Identify the main terminologies of Analogue to digital conversion form	Introduction to Analogue to digital conversion form	Theory	
2	3	Identify the main terminologies of Shannon formula	Shannon formula: Digitalization and quantization theories	Theory	Class work
3	3	Recognize the impact of the Continuous and Digital Convolutional	Continuous and Digital Convolutional theories: (Graphical method, Tabular method , Matrix method) part1	Theory	
4	3	Recognize the impact of the Continuous and Digital Convolutional	Continuous and Digital Convolutional theories: (Graphical method, Tabular method , Matrix method) part2	Theory	Class work
5	3	Evaluating the De-convolution theories	De-convolution theories (Long division method, partial function, polynomial method, and table Method).	Theory	Exam and class work
6	3	Analyzing the steps of Real and Complex Fourier serie	Real and Complex Fourier series part1	Theory	Exam
7	3	Analyzing the steps of Real and Complex Fourier series	Real and Complex Fourier series part2	Theory	exam
8	3		Term Exam 1	Theory	
9	3	Describing the ways of analogue filter to digital filter	analogue filter to digital filter by numerical transformation	Theory	Assignment and exam
10	3	Describing the ways of analogue filter to digital filter	analogue filter to digital filter by bilinear transformation	Theory	Assignment
11	3		Term Exam 2	Theory	project

12	3	Solving difference equation	Solving difference equation based on Frequency response of digital function and LCCDE and nonlinear first order ordinary equation	Theory	project
13	3	Describing the main concept of 1D FT	1D FT theories	Theory	project
14	3	Describing the main concept of 1D DTFT	1D-DTFT theories	Theory	Exam
15	3		Exam	Theory	

11. Course Evaluation
4 Quizzes: 18% (18) 4 Assignments: 4% (4) 2 Term Exam: 15% (15) 1 project: 3% (3) 1 Final Exam: 60% (60)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• 1-Modern Engineering Mathematics by Glyn James, sixth edition, • ISBN: 978-1-292-25349-7 (print) • 978-1-292-25353-4 (PDF) • 978-1-292-25355-8 (ePub) • British Library Cataloguing-in-Publication Data • Description: Sixth edition. | Harlow, England; Hoboken, NJ : Pearson,2020. • 2- A text book of Engineering mathematics-I by H.S.Gangwar, Prabhakar Gupta, second edition. • ISBN (13) : 978-81-224-2847-6 • PUBLISHING FOR ONE WORLD • NEW AGE INTERNATIONAL (P) LIMITED, PUBLISHERS • 4835/24, Ansari Road, Daryaganj, New Delhi - 110002 • Visit us at www.newagepublishers.com

Course Description Form

1. Course Name:

Computer Architecture I

2. Course Code:

COAR303

3. Semester/Year:

Semester 1 / 2025-2026

4. Description Preparation Date:

5 / 10 / 2025

5. Available Attendance Forms:

1. Classroom
2. Google Classroom

6. Number of Credit Hours(Total)/Number of Units(Total)

125 Hour / 5 Units

7. Course administrator's name (mention all, if more than one name)

Name: Asst. Prof. Dr. Dhafir Abdulfattah
Email: dhafir.abdulfattah@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Provides the basic knowledge necessary to understand the hardwa operation of digital computer. • Presents the various digital components used in the organization a design of digital computer. • Shows the necessary steps that a designer must go through to desig an elementary basic computer.

9. Teaching and Learning Strategies

Strategy	The primary instructional strategy focuses on boosting student engagement and sharpening critical thinking skills. This is delivered through a blend of lectures, interactive tutorials, and curated activities designed to resonate with student interests.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Knowledge: Identify the hardware principles of digital computer and data representation. Understanding:	Digital logic circuits and digital components review	Lecture	Exam
2	3		Data representation: Signed number representation	Lecture	Exam + HW
3	3		Data representation: Fixed and floating point representation	Lecture	Exam + Quiz

4	3	Interpret the various components of a digital computer.	Registers, bus and memory transfer	Lecture	Exam
5	3		Arithmetic micro-operations	Lecture	Exam + HW
6	3		Logic and shift micro-operations	Lecture	Exam + Quiz
7	3		Application of logic micro-operations	Lecture	Exam
8	3	Understanding: Interpret the types of instructions of a basic computer.	Basic Computer hardware design: Instruction codes and registers	Lecture	Exam + HW
9	3		Basic Computer hardware design: Computer instructions	Lecture	Exam + Quiz
10	3		Basic Computer hardware design: Timing, control and instruction cycle	Lecture	Exam
11	3		Basic Computer hardware design: Memory reference instructions	Lecture	Exam + Quiz
12	3		Basic Computer hardware design: Register reference instructions	Lecture	Exam
13	3		Basic Computer hardware design: Input-output and interrupt instructions	Lecture	Exam + Quiz
14	3	Analysis: Outline the basic components of elementary basic computer.	Basic Computer hardware design: Complete design	Lecture	Exam
15	3		Programming of Basic Computer	Lecture	Exam

11. Course Evaluation

5 quizzes	25%
3 homework	9%
1 project	3%
1 Report	3%
1 Term Exam	10%
Final Exam	50%
Total	100%

12. Learning and Teaching Resources

Main references (sources)	M. Morris Mano "Computer System Architecture", 3rd Edition, 1992.

Course Description Form

1. Course Name:	
Embedded Systems	
2. Course Code:	
CO304	
3. Semester/Year:	
Fifth/ Third	
4. Description Preparation Date:	
30/4/2026	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
30 Hours /5 Units	
7. Course administrator's name	
Name: Asst. Prof. Dr. Ina'am Fathi khudher Email: inam.fathi@uomosul.edu.iq Name: Name: Kasim Abdullah Ahmed Email: kasimeng@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	On successful completion of this course students will have: • 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. • Explain the functionality of the 8255 Programmable Peripheral Interface (PPI), 8253\ 8254 timer/counter, 8279 keyboard/ display controller, the Direct Memory Access (DMA) , 8251 USART , 8259 Programmable Interrupt Controller (PIC), 8237 DMA controller , and their role in computer interfacing in various modes and apply it in practical interfacing scenarios. • Interface and program A/D and D/A converters with microprocessors for signal processing applications. • Understand the configuration and use of GPIO pins on the Arduino ATmega2560. • Utilize the ATmega2560 instruction set to write and debug programs that perform data manipulation, control operations, and I/O tasks. • Describe the timer/counter, interrupt system, serial communication interfaces (UART, SPI, I2C) modes of

	the ATmega2560 and their respective uses. Develop embedded system applications using these timer/counter modes for timing, counting, and waveform generation.

9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Introduction to Parallel input/output using 8255 PPI and its applications	The 80386 Microprocessor & I/O interfacing	Theory	Exam
2	2	8255 PPI Mode 1 & 8255 PPI Mode 2	8255 PPI	Theory	Exam
3	2	8254 timer / counter architecture and applications	8254 timer / counter	Theory	Exam Quiz
4	2	Architecture and applications	8279 keyboard/display controller	Theory	Exam
5	2	A/D converters and D/A converters architecture and applications	A/D converters and D/A converters	Theory	Exam Quiz
6	2	Architecture and applications.	RS-232 bus & USART 8251	Theory	Exam Assignment
7	2	Microprocessor interrupts (HW and SW), 8259 PIC chip and its programming.	8259 PIC chip	Theory	Exam Quiz
8	2	8237 DMA	8237 DMA chip	Theory	

		chip architecture and its applications			
9	2	Introduction to Micro-controller vs. Microprocessor & ATmega2560 Micro-controller Architecture	Microprocessor & ATmega2560 Micro-controller	Theory	Exam Quiz
10	2	General Purpose I/ O Pins description & instruction set and Addressing modes (Part1)	Arduino Mega 2560 General Purpose I/ O	Theory	Exam
11	2	Instruction set and Addressing modes (Part2)	Instruction set (Part2)	Theory	Exam Quiz
12	2	ATmega2560 6-timer/Counter modes	ATmega2560 6-timer/Counter	Theory	Exam Assignment
13	2	Types of ATmega2560 Interrupts	ATmega2560 Interrupts	Theory	Exam
14	2	ATmega2560 Serial Communication modes of operation	ATmega2560 Serial Communication	Theory	Exam
15	2	Med Term Exam		Theory	
11. Course Evaluation					
5 Quizzes: 20% (20) 2 Assignments: 5% (5) 1 Projects / Lab.: 10% (10) 1 Report : 5% (5)					

1 Term Exam: 10% (10) 1 Final Exam: 50% (50)	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	
Main references (sources)	• Barry B. Bray, The Intel Microprocessors 8086/8088, 80,86,80286,80386,80486, Pentium , Pentium pro processor, Pentium II, Pentium III, Pentium 4 , and core2 with 64bit Extension:Architecture, programming and interfacing, prentice Hall2008. • Walter Triebel and Avtar Singh, The 8088 and 8086 Microprocessors: programming, Interfacing, software, Hardware, Applications, 4th edition, prentice-Hall, 2002.
Recommended books and references (scientific journals, reports)	• Embedded system Design: Embedded systems Foundations of Cyber-Physical Systems, Peter Marwedel, Spriner Nov. 16, 2010. • Data Sheets (8255, 8253,8254,DAC808-ADC809,8251,1650,8237,8259, 8279) by Intel. • Intel 80x86 and other chips hardware reference manuals, Intel. The ATmega640/1280/2560/V Microcontroller Data sheet.
Electronic references, websites	•

Course Description Form

1. Course Name: Operating System	
2. Course Code: CO305	
3. Semester/Year: Five /2025-2026	
4. Description Preparation Date:30-4-2026	
5. Available Attendance Forms: : Lectures & Lab	
6. Number of Credit Hours(Total)/Number of Units(Total)75/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr.Sura Ramzi Shareeef Email:sura.ramzishareef@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	•This course aims to explore the importance of the operating system and its functic In this course covers the different techniques which the operating system uses to achieve its goals as a resource manager .covers an introduction to the design and implementation of operating systems. The students will be introduced to different operating systems and their structures to cover process management (processes, threads, CPU scheduling, synchronization, and deadlock). •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. •Gives the understanding principles of operating systems design and implementation, including file systems and storage; memory management techniques; virtual memory, virtualization and distributed systems.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expand their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. •This course introduces the concepts of the operating system. Includes: different memory management techniques, such as main memory management and virtual memory, paging, segmentation, and demand paging, to optimize memory utilizatio including concepts like and support multitasking in operating systems and file systems and storage; virtualization and distributed systems. •Understand the core principles and concepts of process management in operating systems, including process creation, scheduling, synchronization, and

	communication, to effectively manage system resources and facilitate efficient execution of user programs. •Gain knowledge of different memory management techniques, such as main memory management and virtual memory, including concepts like paging, segmentation, and demand paging, to optimize memory utilization and support multitasking in operating systems. •Explore the structure and functionality of mass storage systems, including disk organization, file systems, and I/O systems, to ensure efficient and reliable storage and retrieval of data in operating systems. •Comprehend the file system interface, implementation, and internals, including fil organization, directory structures, and access methods, for effective management a manipulation of files system in operating systems.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify the main terminologies of operating system and aim of operating system	Introduction to Operating Systems.	Theory	Exam
2	2	Identify the main Structures of operating system	Operating-System Structures	Theory	Exam
3	2	Recognize the main parts of hardware structures	Operating-System Structures	Theory	Exam
4	2	Identify the main terminologies of Processes management	Processes management	Theory	Exam
5	2	Identify the concept Threads management	Threads management	Theory	Exam
6	2	Identify the main terminologies of Synchronization Tools of process	Synchronization Tools	Theory	Exam Quiz
7	2	Analyzing Synchronization	Synchronization Examples	Theory	Exam
8	2	Recognize the main parts of CPU Scheduling	CPU Scheduling	Theory	
9	2	Identify the Deadlocks and avoidance ,prevent problem Deadlocks	Deadlocks	Theory	Exam
10	2	Identify the main terminologies of Main	Main Memory	Theory	Exam

		Memory			
11	2	Recognize the main parts of Virtual Memory	Virtual Memory	Theory	Exam
12	2	Recognize the Storage Management disk	Mass-Storage Structure	Theory	Exam
13	2	Identify the I/O Systems	I/O Systems	Theory	Exam
14	2	Recognize the File Management system	File-System Interface	Theory	Exam
15	2		Term Exam 2	Theory	

11. Course Evaluation
1.Quizzes 4 16% (4) 2.Assignments 2 4% (2) 3.Lab 15 15% (15) 4.Report/ Project 1 5% (5) 5. Midterm Exam 2 hr 10% (10) 6.Final Exam 3 hr 50% (50)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	1. Operating Systems Concepts, 10th Edition Silberschatz, Abraham, Galvin, PeterB., and Gagne, Greg JohnWiley&Sons.,Inc. ISBN: 9781119320913.2. An Introduction to GCC: For the GNU Compilers GCC and G++, Brian J. Gough, Richard M. Stallman, Network Theory Ltd, ISBN : 978-0954161798
Main references (sources)	1. Operating Systems Concepts, 10th Edition Silberschatz, Abraham, Galvin, PeterB., and Gagne, Greg JohnWiley&Sons.,Inc. ISBN: 9781119320913.2. An Introduction to GCC: For the GNU Compilers GCC and
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name:
Artificial Intelligence Fundamentals
2. Course Code:
CO306
3. Semester / Year:
First semester / Third year
4. Description Preparation Date:
30/3/2024
5. Available Attendance Forms:
Attend
6. Number of Credit Hours (Total) / Number of Units (Total):
3/75
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Ali Mukhlif Ahmed Al-Saegh E-mail: ali.alsaegh@uomosul.edu.iq Name: Akram Abdulmawjood E-Mail: akram.dawood@uomosul.edu.iq
8. Course Objectives

Course Objectives	• This course let the students to be familiar with some of the new algorithms and methods in artificial intelligence and machine learning. • 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.

9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encour students' participation in the exercises, while at the same time refining a expanding their critical thinking skills. This will be achieved through class interactive tutorials and by considering type of simple experiments involving so sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understanding basic concepts	Introduction to artificial intelligence and machine learning	Lecture	Discussion
2	2	Understanding the difference between the main tasks of	Classification, regression,	Lecture	Oral exam

		artificial intelligence	clustering, and association		
3	2	Understanding the dimensionality of data and using appropriate methods for feature extraction and selection.	Data exploration and types of learning	Lecture	Discussion
4	2	Understanding of model evaluation by using several metrices such as accuracy and cross-validation.	Confusion matrix and evaluation metrices	Lecture	Homework
5	2	Handling several preprocessing methods	Data normalization and conversion (categorical and numerical)	Lecture	Homework
6	2		Exam or tutorial	Lecture	
7	2	Studying regression algorithms	Regression algorithms (linear, polynomial, and multiple)	Lecture	Homework
8	2	Studying classification algorithm	k-nearest neighbors algorithm	Lecture	Homework
9	2	Studying classification algorithm	Naive Bayes	Lecture	Homework
10	2		Exam or tutorial	Exam	Quiz
11	2	Studying classification algorithm	Decision Tree	Lecture	Homework
12	2	Studying classification algorithm	Support vector machine	Lecture	Homework
13	2	Studying a feature reduction algorithm	Principle component analysis	Lecture	Oral exam
14	2	Studying a feature reduction algorithm	Linear discriminant analysis	Lecture	Homework
15	2		Exam or tutorial	Exam	

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

	Time/Number	**Weight (Marks)**
Quizzes	2	15% (15)

	Online Assignments	2	10% (10)
	Onsite Assignments	1	5% (5)
	Projects	1	10% (10)
	Midterm Exam	2 hr	10% (10)
	Final Exam	3hr	50% (50)
	Total assessment		100% (100 Marks)

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Lecture notes
Main references (sources)	Pattern Recognition and Machine Learning by Christopher M. Bishop
Recommended books and references (scientific journals, reports)	Soft Computing and its Applications by Kumar S. Ray
Electronic references, websites	Pattern Recognition and Machine Learning by Christopher M. Bishop

Course Description Form

1. Course Name:	
Computer Networks	
2. Course Code:	
CONE307	
3. Semester/Year:	
Six / Third	
4. Description Preparation Date:	
31/03/2024	
5. Available Attendance Forms:	
In class / on meet	
6. Number of Credit Hours(Total)/Number of Units(Total)	
150/6	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Salah Abdulghani Email: eng.salah@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	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
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1&2	6	Identify and describe the basics of wireed networks	Wired LANs	Lecture & LAB	Quiz & Oral exam
3	3	Explain and compare with various types of	Connecting LANs, Backbone Networks,	Lecture &	Quiz

		Networks	and Virtual LANs	LAB	
4	3	Identify and describe the Network layer	Introduction to Network Layer	Lecture	Oral exam Home work
5 & 6	6	Explain and compare with various types of protocols in the network layer	Network Layer and IPv4 and IPv6 Addresses	Lecture	Oral exam Home work
7 & 8	6	Identify and describe the Routing Protocols	Routing Fundamentals and Routing Protocols	Lecture & LAB	Exam
9	3	Identify and describe Transport Layer	Introduction to Transport Layer	Lecture	Quiz
10 & 11	6	Identify and describe the Transport Layer protocols	Transport Layer Protocols	Lecture	Oral exam Home work
12	3	Identify and describe the Application Layer	Introduction to the Application Layer	Lecture & LAB	Quiz
13 & 14	6	Identify and describe the application layer protocolss	Standard Client-Server Protocols (DHCP, NS,FTP,TFTP,HTTP, TELNET, SMTP, POP, IMAP)	Lecture & LAB	Oral exam Home work
15	3	Identify and describe The DHCP, ICMP, ARP	DHCP, ARP, ICMP	Lecture	Exam

11. Course Evaluation		
Quizzes	20% (20)	4
Assignments	10% (10)	2
Report/Lab	10% (10)	5
Midterm Exam	10% (10)	3 hr

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Behrouz A. Forouzan, “Data communication and Networking”, Fifth Edition, Tata McGraw – Hill,2015. Cory Beard and William Stallings, “Wireless Communication Networks and Systems” (ISBN: 0133594173, available online
Main references (sources)	James F. Kurose, Keith W. Ross, “Computer Networking – A Top-Down Approach Featuring the Internet”, seventh Edition, Pearson Education, 2016
Recommended books and references (scientif journals, reports)	-----
Electronic references, websites	-----

Course Description Form

1. Course Name:
Digital signal processing
2. Course Code:
DISP321
3. Semester/Year:
Second / third
4. Description Preparation Date:
29\4\2026
5. Available Attendance Forms:
Lectures
6. Number of Credit Hours(Total)/Number of Units(Total):
30 Hours /3 Units
7. Course administrator's name
Name: Dr. Zahraa Talal Abed Email: zahraatalal@uomosul.edu.iq

8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • Analyze the discrete-time signals and systems in the frequency domain using Frequency response. • Understand the relationship between S-transform and Z- transform. • 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. • Design FIR and IIR filters using a variety of techniques. • Analyzing the steps of encryption and decryption algorithms • Describing the ways of implementing access control • Describing the modes of IPSec security • Listing IPSec protocols and describing their principles of operation • Understanding the establishment of the security parameters via security association

9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Identify the main terminologies of Discrete-time systems	Overview of Frequency Response in Discrete-time systems	Theory	
2	3	Identify the main Z trabsgotm	z-transform and its properties	Theory	Assignment

3	3	Recognize the impact of ROC: Regin of convergence	ROC: Regin of convergence	Theory	
4	3	Identify the plot the poles and zeros in Domain	Represent and poles and zeros in Domain	Theory	Class work
5	3	Evaluating the level of Transfer function and output response	Transfer function and output response	Theory	Exam
6	3	Analyzing filter types and properties	Steps of design filter and their types	Theory	Assignment
7	3	Analyzing analogue filter	Steps of design analogue filter and their types	Theory	Assignment
8	3		Term Exam 1	Theory	
9	3	Describing the ways of convert analogue filter to digital filter	convert analogue filter to digital filter by numerical method	Theory	classwork
10	3	Describing the ways of convert analogue filter to digital filter	convert analogue filter to digital filter by bilinear method	Theory	Exam Quiz
11	3	Describing the types of Firewalls	Firewalls		
12	3		Term Exam 1	Theory	
13	3	Understand the main concept of digital filter	Digital filter design and realization (direct and indirect methods)	Theory	project
14	3	Understand the main concept of digital filter	Digital filter design and realization (parallel and cascading methods)	Theory	Project
15	3		Term Exam	Theory	

11. Course Evaluation		
Quizzes	4	18% (18)
Assignments	4	4% (4)
test summary	2	15 % (15)
Report 1	3%(3)	
Final Exam	3 hr	60% (60)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• Discrete-Time Signal Processing" 3rd Edition, ALAN V. OPPENHEIM and W. SCHAFER HEWLETT, Prentice-Hall Signal Processing Series, 2010. • "Digital Signal Processing", 3rd, Mithra, McGraw Hill Publications, 2008

Course Description Form

1. Course Name:
Computer Architecture II
2. Course Code:
COAR309
3. Semester/Year:
Semester 2 / 2025-2026
4. Description Preparation Date:
5 / 10 / 2025
5. Available Attendance Forms:
3. Classroom 4. Google Classroom
6. Number of Credit Hours(Total)/Number of Units(Total)
125 Hour / 5 Units
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Prof. Dr. Dhafir Abdulfattah Email: dhafir.abdulfattah@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Provides the basic knowledge necessary to understand the principle of microprogrammed control unit. • Highlights the central processing unit and the RISC & CISC Characteristics. • Gives the understanding of pipeline concepts and design.
9. Teaching and Learning Strategies	
Strategy	The primary instructional strategy focuses on boosting student engagement and sharpening critical thinking skills. This is delivered through a blend of lectures, interactive tutorials, and curated activities designed to resonate with student interests.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Knowledge: Identify the principle of the microprogrammed control unit. Analysis: analyze the basic components of the microprogrammed control unit by writing microprograms.	Microprogrammed Control: Introduction	Lecture	Exam
2	3		Microprogrammed Control: Mapping and sequencer	Lecture	Exam + HW
3	3		Microprogrammed Control: Micro-instructions	Lecture	Exam + Quiz
4	3		Microprogrammed Control: Micro-instructions programming	Lecture	Exam

5	3		Microprogrammed Control: Design of decoding ALU control information	Lecture	Exam + HW
6	3		Microprogrammed Control: Design of microprogram sequencer	Lecture	Exam + Quiz
7	3		Microprogrammed Control: Condition and branching implementation	Lecture	Exam
8	3	Understanding: Interpret the components of the central processing unit and the RISC & CISC Characteristics. Application: illustrate the concepts of addressing modes and stacking.	Central Processing Unit: General registers organization	Lecture	Exam + HW
9	3		Central Processing Unit: Stack organization	Lecture	Exam + Quiz
10	3		Central Processing Unit: Instruction format and addressing mode	Lecture	Exam
11	3		Central Processing Unit: Flags (processor status word)	Lecture	Exam + Quiz
12	3		RISC & CISC characteristics	Lecture	Exam
13	3	Knowledge: Identify the principle of the pipelining. Analysis: analyze the basic components of the pipeline.	Pipelining concepts and design	Lecture	Exam + Quiz
14	3		Pipelining concepts and design	Lecture	Exam
15	3		Pipelined processor	Lecture	Exam

11. Course Evaluation

5 quizzes	25%
3 homework	9%
1 project	3%
1 Report	3%
1 Term Exam	10%
1Final Exam	50%
Total	100%

12. Learning and Teaching Resources

Main references (sources)	M. Morris Mano "Computer System Architecture", 3rd Edition, 1992.

Course Description Form

1. Course Name:	
Mathematics VI	
2. Course Code:	
CO310	
3. Semester/Year:	
Sixth/ Third year	
4. Description Preparation Date:	
30/4/2024	
5. Available Attendance Forms:	
attender	
6. Number of Credit Hours(Total)/Number of Units(Total)	
175/7	
7. Course administrator's name (mention all, if more than one name)	
Dr Sura Nawfal sura.nawfal@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	Upon successful completion of this course, students will be able to: • Identify, analyze, and solve complex engineering problems using principles of mathematics, science, and engineering • Apply appropriate mathematical methods and learning strategies to acquire and use new knowledge effectively • Work professionally and ethically in multidisciplinary teams and engineering environments • Solve and analyze systems of differential equations using Wronskian, phase plane methods, and stability criteria • Obtain and analyze series solutions of ordinary differential equations using Power Series, Taylor Series, and Frobenius methods • Apply special functions such as Legendre and Bessel functions in engineering problem solving • Solve systems of linear equations using Gaussian elimination, Cramer's rule, and matrix inverse methods • Apply matrix algebra including eigenvalues and eigenvectors in analyzing linear systems • Apply numerical methods such as Finite Difference Method (FDM) and Finite Element Method (FEM) to boundary value problems • Apply vector calculus and integral theorems including Green's theorem and surface integrals in engineering applications
9. Teaching and Learning Strategies	

Strategy	The main strategy adopted in teaching this course is to encourage active student participation in solving mathematical exercises and problems, with a strong emphasis on developing their analytical and critical thinking skills. This will be achieved through theoretical lectures, interactive tutorial sessions, and the use of diverse mathematical and engineering examples that enhance conceptual understanding and link mathematical theories to practical applications. In addition, in-class activities are incorporated to support active learning and improve student engagement.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Understand series solutions of differential equations	Power Series Method	Theoretical	Exam
2	4	Apply Taylor series in solving equations	Taylor Series	Theoretical	Exam + Daily Quiz
3	4	Solve differential equations using Frobenius method	Frobenius Method	Theoretical	Exam
4	4	Solve and analyze Legendre equation	Legendre Equation	Theoretical	Exam
5	4	Apply Legendre polynomials in engineering problems	Legendre Polynomials	Theoretical	Exam
6	4	Solve and analyze Bessel equation	Bessel Equation	Theoretical	Exam + Assignment
7	4	Apply Bessel functions in engineering applications	Bessel Functions	Theoretical	Exam
8	4	Solve linear systems using matrix methods	Gaussian Elimination & Cramer’s Rule	Theoretical	Exam
9	4	Apply matrix inverse in solving linear systems	Matrix Inversion	Theoretical	Exam
10	4	Analyze eigenvalues and eigenvectors	Eigenvalues & Eigenvectors	Theoretical	Exam + Daily Quiz
11	4	Apply vector calculus in engineering problems	Vector Calculus	Theoretical	Exam

12	4	Understand Green's theorem in the plane	Green's Theorem	Theoretical	Exam
13	4	Apply complex numbers and analytic functions	Complex Numbers & Analytic Functions	Theoretical	Exam
14	4	Apply complex integration techniques	Complex Integration	Theoretical	Exam
15	4		Seminar+ Final Exam	Theoretical	Exam

11. Course Evaluation
5 Daily Quizzes: 20% (20 marks) 2 Homework Assignments: 2% (2 marks) 2 In-class Assignments: 3% (3 marks) 1 Report: 5% (5 marks) 1 Summary Test: 10% (10 marks) 2 Midterm Exams: 10% (10 marks) Final Exam: 50% (50 marks)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• G. B. Thomas, E. Transcendentals, M. D. Weir, J. Hass, and C. Heil, Calculus, 13th edition. 2014. • Glyn J. -Modern Engineering Mathematics, sixth edition, ISBN: 978-1-292-25349-7 (print), British Library Cataloguing-in-Publication Data, Harlow, England; Hoboken, NJ : Pearson,2020. • Bird, John. Understanding engineering mathematics. Routledge, 2014
Main references (sources)	
Recommended books and references (scientific journals, reports)	
Electronic references, websites	https://tan-vectors.web.app/ https://www.geogebra.org/m/QPE4PaDZ https://phet.colorado.edu/sims/html/masses-and-springs/latest/masses-and-springs_all.html

Course Description Form

1. Course Name:
Physics II
2. Course Code:
Co311
3. Semester/Year:
Second / Third
4. Description Preparation Date:
30/4/2026
5. Available Attendance Forms:
Lectures
6. Number of Credit Hours(Total)/Number of Units(Total):
175 Hours /7 Units
7. Course administrator's name
Name: Prof. Dr. Rabee M. Hagem Email: rabeehagem@uomosul.edu.iq Name: Ahmed Samir Ahmed Jagmagji Email: ahmedsa1983@uomosul.edu.iq
8. Course Objectives

Course Objectives	• To provide computer engineering students with a strong foundation in the principles of modern physics that underpin today's computing and electronic technologies. • To bridge the gap between physics theory and engineering applications in semiconductors, nanotechnology, photonics, and quantum devices. • To develop analytical and problem-solving skills for applying modern physics concepts in electronic circuits, devices, and future computing technologies. • To introduce students to the role of quantum mechanics, relativity, and solid-state physics in the design and operation of modern computer systems. • To prepare students for advanced studies and research in areas such as microelectronics, quantum computing, and embedded systems.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple case studies involving some sampling activities that are interesting to the students.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Describe the limitations of classical physics and identify key experiments that led to the emergence of modern physics.	Introduction & Classical Physics Limitations	Theory	
2	4	Explain the particle nature of light and evaluate experimental evidence such as the photoelectric effect.	Particle Nature of Light	Theory	Quiz
3	4	Describe the wave–particle duality of matter and apply it to analyze electron behavior in physical systems.	Wave Nature of Matter	Theory	Assignment
4	4	Apply fundamental quantum mechanics concepts, including the Schrödinger equation and tunneling, to simple physical models.	Quantum Mechanics Basics	Theory	Quiz
5	4	Explain atomic structure using quantum theory and analyze electron configurations and energy levels.	Atomic Structure	Theory	Assignment
6	4	Evaluate the principles of relativity and assess their impact on modern engineering technologies such as GPS.	Relativity Essentials for Engineers	Theory	Quiz
7	4	Describe the basic principles of statistical physics and apply them to understand particle distributions and thermodynamic behavior.	Statistical Physics Introduction	Theory	Midterm Exam
8	4	Explain crystal structures and analyze electronic properties of solids using basic band theory.	Solid State Physics I	Theory	Quiz
9	4	Analyze advanced solid-state concepts including carrier dynamics and evaluate material	Solid State Physics II	Theory	Report

		properties for electronic applications.			
10	4	Demonstrate an understanding of semiconductor behavior and evaluate the operation of devices such as diodes, MOSFETs, and transistors.	Semiconductor Devices	Theory	Quiz
11	4	Describe superconductivity and nanomaterial properties and evaluate their significance in modern technology.	Superconductivity and Nanomaterials		Assignment
12	4	Apply quantum and optical principles to analyze photonic and optoelectronic devices.	Photonics and Optoelectronics	Theory	Quiz
13	4	Explain fundamental quantum computing concepts and analyze simple quantum systems and qubits.	Introduction to Quantum Computing	Theory	Report
14	4	Evaluate the role of modern physics in information technology and communicate physics-based reasoning in engineering applications	Modern Physics in Information Technology	Theory	Assignment
15	4	Demonstrate readiness for advanced topics by reviewing prerequisite concepts and apply integrated knowledge of modern physics to analyze and solve comprehensive problems in the final exam.	Preparatory week and final Exam	Theory	final Exam

11. Course Evaluation

6 Quizzes: 20% (20)
4 Assignments: 10% (10)
2 Reports: 10% (10)
1 Term Exam: 10% (10)
1 Final Exam: 50% (50)

12. Learning and Teaching Resources

Required textbooks(curricular books, if any)	Electronic Devices, Thomas L. Floyd, 7th

	edition, 2017 Modern Physics for Scientists and Engineers – Thornton & Rex • Solid State Electronic Devices – Ben Streetman & Banerjee • Concepts of Modern Physics – Arthur Beiser • Quantum Computation and Quantum Information – Nielsen & Chuang (Supplementary)

Course Description Form

1. Course Name:	
Engineering Project Design and Planning	
2. Course Code:	
CE312	
3. Semester/Year:	
Second semester/Third year	
4. Description Preparation Date:	
31/3/2026	
5. Available Attendance Forms:	
In class / on meet	
6. Number of Credit Hours (Total)/Number of Units (Total)	
50/2	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Mazin Hashim Aziz Email: mazin.haziz@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	The students will learn how to: • Analyze and solve engineering design problems. • Acquire and apply new knowledge using appropriate learning strategies. • Participate and work professionally and ethically in different projects to function on multidisciplinary teams. • Possess in-depth knowledge of system design methodologies, project management fundamentals (schedule, resources, budget, risk), requirements engineering, and design documentation. • Understand the relationships among system requirements, architecture, module design, verification/validation, and lifecycle constraints (e.g., safety, sustainability, and manufacturability). • Apply system design tools (e.g., UML diagrams, data-flow diagrams, block diagrams), project planning tools (e.g., Gantt, PERT), resource/budget spreadsheets, and risk registers in the context of a capstone project. • Evaluate the selected design solution against stated requirements, constraints, and stakeholder needs, and justify why it is fit for purpose. Assess team processes, ethical implications, sustainability aspects, and the overall project plan's feasibility. • Create a comprehensive project proposal document that integrates a problem statement, literature review, requirements, system design, project schedule, resource/budget plan, risk management, and communication artifacts. Develop a prototype/test-plan outline, and produce design deliverables (diagrams, reports, and presentations) that demonstrate original engineering work and planning readiness.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage

	students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	An ability to acquire and apply new knowledge about the capstone project structure.	Introduction to capstone project structure and expectations.	Lecture	Exam
2	2	An ability to acquire and apply new knowledge about the Problem identification, scoping, and stakeholder analysis.	Problem identification, scoping, and stakeholder analysis.	Lecture	Quiz, Exam
3	2	An ability to acquire and apply new knowledge about Literature review methods and state-of-the-art analysis.	Literature review methods and state-of-the-art analysis.	Lecture	Assignment, Exam
4	2	Learning the basics of functional engineering requirements, non-functional, use cases.	Functional engineering requirements, non-functional, use cases.	Lecture	Assignment, Exam
5	2	Learning the basics of system architecture and module design.	System architecture and module design (UML, DFD, block diagrams).	Lecture	Quiz
6	2	Learning the principles of algorithmic and subsystem design.	Detailed algorithmic and subsystem design.	Lecture	Exam
7	2	Learning the basics of project scheduling.	Project scheduling: WBS, Gantt, PERT, milestone planning.	Lecture	Exam
8	2	Learning and applying resource planning.	Resource planning: procurement, budgeting, staffing.	Lecture	Assignment, Quiz, Exam
9	2	An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment. (7)	Workshop 1	Interactive	Assignment
10	2	An ability recognize risk management and quality assurance planning.	Risk management and quality assurance planning.	Lecture	Exam.

11	2	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments. (5)	Ethics, sustainability, safety, and regulatory compliance.	Lecture	Assignment, Quiz
12	2	Learning prototyping and validation planning.	Prototype and validation planning	Lecture	Assignment, Exam
13	2	An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment. (7)	Workshop 2	Interactive	Assignment
14	2	The ability to present and defend his work.	Final proposal preparation and defense	Lecture	Assignment, Exam
15	2	All	Final Exam Preparation	Theory	

11. Course Evaluation	
3-Quizzes	15%
1- Assignments	5%
2-Workshops	20%
Term Exam	10%
Final Exam	50%
Total	100%

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Shanthi, Dr. P., Dr. Domenic T. Sanchez, Mr. Jaffer Ali Khan, and Dr. Alamelu Mangai Raman. "Project Management". Scihorizon, 2023.
Main references (sources)	Lectures and notes.
Recommended books and references (scientific journals, reports)	Dandy, G., Walker, D., Daniell, T., & Warner, R. (2008). "Planning and design of engineering systems" (2nd ed.). Taylor & Francis.
Electronic references, websites	https://classroom.google.com/c/ODQxNjgzMzczN y?cjc=vkprlpt2

University of Mosul / College of Engineering / Computer Engineering Department

Course Materials / Fourth Year / First Semester 2025-2026

Course Name	Number of Theory Hours	Number of Practical Hours	Number of Units	Code
Professional Ethics	1	-	1	PRET401
Fundamentals of Control Systems	3	3	4	FUCS402
Real Time Systems	2	3	3	RETS403
Software Engineering	2	3	3	WINE405
Parallel Computer Processing	2	-	2	ARPP406
Machine Learning Programing	2	-	2	ELCO404
Total hours and units	12	9	15	

University of Mosul / College of Engineering / Computer Engineering Department

Course Materials / Fourth Year / Second Semester 2025-2026

Course Name	Number of Theory Hours	Number of Practical Hours	Number of Units	Code
Graduation Project	4	-	4	GRPO411
Computer Graphics	2	-	2	COGR412
Cyber Security	2	-	2	CYSE413
Fundamentals of Mobile Systems	2	3	3	FUMS414
Image Processing and Applications	2	-	2	IMPA415
Applied Sciences	3	-	3	ELCO416
Total hours and units	15	3	16	

Course Description Form

1. Course Name:	
Professional Ethics	
2. Course Code:	
PRET401	
3. Semester/Year:	
First / Fourth	
4. Description Preparation Date:	
5/4/2024	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
30 Hours /1 Units	
7. Course administrator's name	
Name: lecture Modhar Ahmed Hammoudy Email: modharhammoudy@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • Identify, analyze, and solve complex engineering problems according to principles of engineering, science, and mathematics. • Acquire and apply new knowledge and using appropriate learning strategies. • Participate and work professionally and ethically in different projects to function on multi-disciplinary teams. • Defines and understands the concepts of ethics and professional ethics. • Identifies the areas of ethical study. • Identify ethical issues in computing work, applications, and/or use cases, and distinguish them from technical, legal, commercial, or PR issues/challenges • Apply some specific concepts of normative ethics (such as duties, rights, virtues, values, justice, human flourishing, utility, risk, harm, etc.) to Computer Engineering contexts • Identify the relevant moral stakeholders in a Computer Engineering scenario • Identify some of the important moral values, interests, hazards, and conflicts at stake in a particular scenario • Apply one or several general frameworks for ethical decision-making in the context of Computer Engineering projects.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify the main Meaning of Ethics	Introduction Meaning of Ethics	Theory	Exam
2	2	Identify the main Meaning of Ethics	Branches of Philosophical Ethics	Theory	Exam
3	2	Identify the main Meaning of Ethics	The Meaning and Nature of Professional Ethics	Theory	Exam
4	2	Recognize the nature of Ethics	Normative Ethical Theories: Consequentialism	Theory	Exam
5	2	Recognize the nature of Ethics	Egoism	Theory	Exam Quiz
6	2	Analyzing the ethical theorize	Psychological Egoism	Theory	Exam
7	2	Analyzing the ethical theorize	Ethical Egoism Utilitarianism	Theory	Exam
8	2	Analyzing the ethical theorize	Normative Ethical Theories - Deontology	Theory	
9	2	Recognize the nature of Ethics	Kantian Deontology	Theory	Exam
10	2	Describing the ethical principles	Rossian Deontology	Theory	Exam Quiz
11	2	Describing the ethical principles	Normative Ethical Theories – Virtue Ethics irtue		
12	2	Describing the ethical principles	The Nature of Moral	Theory	Exam
13	2	Identify the principles and methods of ethics	VAristotle’s Virtue Ethics	Theory	Exam
14	2	Identify the principles and methods of ethics	Ethical Principles for the Engineering Profession	Theory	Exam
15	2		Term Exam	Theory	Exam

11. Course Evaluation	
2 Quizzes	8% (8)
1 Projects	8% (8)
1 Report	4% (4)
Term Exam	20% (10)
Final Exam	60% (50)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• The Ground of Professional Ethics By Daryl KoehnCopyright 1994 • 1st Edition Ethical Issues in Journalism and the Media Edited By Andrew Belsey, Ruth ChadwickCopyright 1992

Course Description Form

1. Course Name:
Fundamentals of Control System
2. Course Code:
FUCS402
3. Semester/Year:
First/ Fourth
4. Description Preparation Date:
5/4/2025
5. Available Attendance Forms:
Physical attendance
6. Number of Credit Hours(Total)/Number of Units(Total)
150/6
7. Course administrator's name (mention all, if more than one name)
Name: Ola Marwan Email: ola.marwan@uomosul.edu.iq Name: Sura Nawfal Email: sura.nawfal @uomosul.edu.iq
8. Course Objectives

Course Objectives	● Understanding the principles and fundamentals of control systems, including the concepts of open and closed loop systems, transfer functions, block diagram models, and the differential equations governing physical systems (1). ● Analyze the Performance of Control Systems, including the analyzing the transient and steady-state responses of control systems, assessing system stability using various methods (Routh-Hurwitz criterion, root locus), evaluating frequency domain characteristics (2). ● Design and Compensate Control Systems, Applying root locus and frequency response techniques for controller design (3). ● Simulate and Implement Control Systems, utilizing simulation software (MATLAB/Simulink) to model and analyze control systems, understanding the basic principles of digital control and discrete-time systems.
9. Teaching and Learning Strategies	
Strategy	1- Apply knowledge of mathematics, science, and engineering 2- Ability to work effectively within multidisciplinary teams 3- Identify, formulate, and solve engineering problems

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Learn basic of Control system	Classifying control system	Lecture/lab	Oral Exam
2,3	4	Understand Mathematical system representation	Characteristics & types	Lecture/lab	Oral Exam Homework
4,5	4	Learn Block diagram models	Block diagram fundementals	Lecture/lab	Oral Exam Homework
6,7	4	Understand signal flow graph models	Mason's Rule	lecture	Oral Exam Quiz
8	2	Learn State variable models	state variables of dynamic system state equation	lecture	Oral Exam
9	2	Understand controllability and observability	Testing the controllability and observability	lecture	Oral Exam
10	2	Learn System response	Time response of 2nd order systems	Lecture/lab	Quiz
11	2	Understand Dynamic performance of 2nd order system	steady state of feedback system	lecture	Homework
12,13	4	Learn Stability	the concept of stability Routh – Hurwitz criteria	lecture	Exam
14	2	Root locus	the Root Locus	lecture	Oral Exam

			concept the root locus procedure		
15	2		Final exam		
			Classifying real time system, HW & SW		

11. Course Evaluation	
5pts	2 quizzes
5pts	3 homework
5pts	reports
5pts	Project
20pts	Term Exam
10pts	Lab
50pts	Final Exam
100pts	Total

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	(Kuo) Automatic Control Systems.
Main references (sources)	(Ogata) Modern Control Engineering.
Recommended books and references (scientific journals, reports)	(Dorf Bishop) Modern Control Systems.
Electronic references, websites	

Course Description Form

1. Course Name:
Real Time Systems
2. Course Code:
RETS404
3. Semester/Year:
First/ Fourth
4. Description Preparation Date:
29/4/2026
5. Available Attendance Forms:
Physical attendance
6. Number of Credit Hours(Total)/Number of Units(Total)
90/6
7. Course administrator's name (mention all, if more than one name)
Name: amar daood Email: Amar.daood@uomosul.edu.iq Name: Basman Mahmood Email: bm.alhafidh@uomosul.edu.iq
8. Course Objectives

Course Objectives	● Be familiar with the basics of real time system. ● Analyze and design any required real time system and provide solutions to any problem will be faced during testing stage. ● Understand the basic knowledge of the sensor's types. ● Be familiar with the Signal conditioning. ● Have the ability to code with the Real time languages.
9. Teaching and Learning Strategies	
Strategy	4- Apply knowledge of mathematics, science, and engineering 5- Ability to work effectively within multidisciplinary teams 6- Identify, formulate, and solve engineering problems

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Learn basic of real time system	Classifying real time system, HW & SW	Lecture/lab	Oral Exam
2,3	4	Understand types of sensors	Sensors: Characteristics & types	Lecture/lab	Oral Exam Homework
4,5	4	Learn Signal	Signal	Lecture/lab	Oral

		conditioning	conditioning		Exam Homework
6,7	4	Understand data buses	Data buses.	lecture	Oral Exam Quiz
8	2	Learn types of storages	Types of storage devices, non-volatile memories & interconnection between them	lecture	Oral Exam
9	2	Understand single and multitasking	Single chip computer, board comp., multitasking	lecture	Oral Exam
10	2	Learn Real time application	Real time software-control & software application	Lecture/lab	Quiz
11	2	Understand Processes synchronizatio n	Processes interconnection s & synchronization	lecture	Homework
12,13	4	Learn scheduling	Real time scheduler, deadlocks	lecture	Exam
14	2	Learn Real time data base and Real time languages	Real time data base and Real time languages	lecture	Oral Exam
15	2		Final exam		
			Classifying real time system, HW & SW		

11. Course Evaluation

5pts	2 quizzes
5pts	3 homework
5pts	reports
5pts	Project
20pts	Term Exam
10pts	Lab

50pts Final Exam 100pts Total	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Real Time Microcomputer System Design (peter D. Lawrence)McGraw-Hill Education (ISE Editions).)
Main references (sources)	Measurement and Instrumentation Systems (W. Bolton) (Butterworth-Heinemann).
Recommended books and references (scientific journals, reports)	Measurement and Instrumentation Principles (Alan S. Morris)(British Library Cataloguing in Publication Data).
Electronic references, websites	

Course Description Form

1. Course Name:	
Software Engineering	
2. Course Code:	
WINE405	
3. Semester/Year:	
First / Fourth	
4. Description Preparation Date:	
29/4/2026	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
45 Hours /3 Units	
7. Course administrator's name	
Name: Asst. Prof. Dr. Sura Ramzi Shareef Email: sura.ramzishareef@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • Identify the main terminologies of software engineering such as software process models and software phases such as analysis requirement documentation, design and testing • Comparing different between software engineering, system engineering and computer science and why it's important. • Recognize some ethical and important of software engineering • Recognize software process models • Analyzing the requirements steps of software system and software process phases • Fundamental concepts of requirements engineering, Analysis Modeling and major considerations for enterprise integration and development • Design, Testing and maintenance measures, how can dealing with OOP of Java programming.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and activities the students by seminars report assignment through class .

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify the main terminologies of software engineering and why it's important	Introduction to software engineering	Theory	Exam
2	2	Identify the main terminologies of software process	Introduction to Software Process	Theory	Exam
3	2	Recognize concepts of Software process	Software Process Phases	Theory	Exam
4	2	Identify the main terminologies of Capability Maturity Model	Capability Maturity Model Step Wise Refinement	Theory	Exam
5-6	4	Identify Requirements Engineering and Documentation	Requirements Engineering	Theory	Exam
7	2	Identify the main terminologies of testing and goal testing	Software Testing Phases	Theory	Exam Quiz
8	2	Analyzing the steps Design process	Software Design phases	Theory	Exam
9	2		Term Exam 1	Theory	
10	2	Identify Maintenance and Important development	Maintenance Phase	Theory	Exam
11	2	Describing the basic concept of programming	Introduction in java	Theory	Exam
12	2	Describing the concepts of object oriented programming	Introduction to object oriented programming with Java	Theory	Exam
13	2	Understanding the importance of object	object oriented programming with	Theory	Exam

		oriented programming	Java		Quiz
14	2	Describing the main phases of software process phases in seminar	Report /Seminar software process phases	Theory	Assignment of Report +Seminar
15	2		Term Exam 2	Theory	

11. Course Evaluation	
2 Quizzes: 5% (5) 1 Assignment + Seminar : 5% (5) 2 Term Exam: 30% (30) 1 Final Exam: 60% (60)	
12. Learning and Teaching Resources	
Required textbooks	• Ian Sommerville,"Software Engineering", 9th Edition, Pearson Education Asia, 2011. • Ian Sommerville,"Software Engineering", 10th Edition, Pearson Education Asia, 2016. • Stephen R. Schach," Software Engineering with JAVA " • Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Seventh Edition, Mc

Course Description Form

1. Course Name:	
Parallel Computer Processing	
2. Course Code:	
ARPP406	
3. Semester/Year:	
First / Fourth	
4. Description Preparation Date:	
2026	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
30 Hours /2 Units	
7. Course administrator's name	
Name: Prof. Dr. Shefa Abdulrahman Dawwd Email: shefa.dawwd@uomosul.edu.iq Dr. Ula Tarik Salim ula.tariq@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	Provides the necessary knowledge to • develop fast parallel computing algorithms and systems • improve an existing architecture • design a new computer system
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understanding the factors that influence computer speed, including hardware design, architectural choices, and algorithmic efficiency. In addition, understanding of the architecture of standard computers, including the organization and design principles of processors, memory systems, and I/O subsystems	Computer Speed and the Architecture of Standard Computers	Lecture	Exam
2	2	Understand the advantages	Flynn	Lecture	Exam

		and challenges of parallel computing and how it can improve performance in certain applications	Classification		
3	2	Understand how performance metrics are measured and evaluated, including concepts such as latency, throughput, and Amdahl's Law	The Performance, Cost and Amdahl's Law	Lecture	Exam
4	2	Study the memory hierarchy in computer systems and understand the role of cache memory in improving performance	Cache Memory	Lecture	Assignment, Exam
5	2	Learn about cache organization, replacement policies, and cache coherence protocols	Cache Memory	Lecture	Report, Quiz, Exam
6	2	Study memory interleaving technique to enhance memory access efficiency	Memory Interleaving	Lecture	Assignment, Quiz, Exam
7	2	Identify the hardware design for arithmetic operations (addition/ subtraction)	Parallel Arithmetic (Carry Save Adder)	Lecture	Assignment, Exam
8	2	Identify the hardware design for arithmetic operation (multiplication)	Parallel Arithmetic (Carry Save Multiplier)	Lecture	Quiz, Exam
9	2		Term Exam 1		Exam
10	2	Understand the design principles, and applications associated with the parallel processing architectures including SIMD and vector processors	SIMD Architecture (Vector Processor)	Lecture	Assignment, Exam
11	2	Understand the design principles, and applications associated with the parallel processing architectures including SIMD and vector processors	SIMD Architecture (Vector Processor)	Lecture	Quiz, Exam
12	2	Understand the design	Digital Signal	Lecture	Exam

		principles, algorithms, and applications associated with the architecture DSP	Processor		
13	2	Understand the design principles, algorithms, associated with the architecture of Array Processors Such as DFT and FFT	Array Processor (DFT and FFT processor)	Lecture	Exam
14	2	Understand the application and architecture of DFT and FFT Understand the design principles of 1D Systolic Array Processor architecture and its application on 1D convolution	Array Processor (DFT and FFT processor) Systolic Array Processor (1D)	Lecture	Exam
15	2		Term Exam 2		Exam
11. Course Evaluation					
4 Quizzes: 10% (10) 4 Assignments: 2% (2) 1 Report 3%(3) 2 Term Exam: 25% (25) 1 Final Exam: 60% (60)					
12. Learning and Teaching Resources					
Required textbooks(curricular books, if any)			• K. Hwang and F.A. Briggs "computer Architecture and parallel processing" • Peter Pirch "Architectures for DSP"		

Course Description Form

1. Course Name:	
Machine Learning Programming	
2. Course Code:	
CO404	
3. Semester/Year:	
First / Fourth	
4. Description Preparation Date:	
5/4/2024	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
33 Hours /4 Units	
7. Course administrator's name	
Name: Asst. Prof. Dr. Ali Mukhlif Ahmed Al-Saegh Email: ali.alsaegh@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	• 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. • Knowing the main purposes of machine learning (classification, clustering, regression, and association). • Understanding and applying the model evaluation using several matrices, such as accuracy and confusion matrix. • Understanding the dimensionality of data and using appropriate methods for feature extraction and selection. • Learning the main tools used in Python for the application of machine learning algorithms. • Modern algorithms for classification, clustering, and regression using Python.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encour students' participation in the exercises, while at the same time refining a expanding their critical thinking skills. This will be achieved through class interactive tutorials, and the application of several study cases.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify the main terminologies of Machine learning	Introduction to machine learning	Theory	Exam
2	2	Identify the main	Classification,	Theory	Exam

		terminologies of Machine learning	regression, clustering, and association		Quiz
3	2	Classification metrics	Confusion matrix and evaluation matrices	Theory	Exam
4	2	Regression and its metrics	Regression algorithms (linear, polynomial, and multiple)	Theory	Exam
5	2	Classification algorithms	k-nearest neighbors algorithm	Theory	Exam
6	2	Algorithm programming	Application using Python	Theory	Exam Assignment
7	2	Analyzing the steps encryption and decryption algorithms	Naive Bayes	Theory	Exam
8	2	Classification algorithms	Decision Tree	Theory	
9	2	Algorithm programming	Application using Python	Theory	Exam
10	2	Classification algorithms	Support vector machine	Theory	Exam Quiz
11	2	Feature reduction	Principle component analysis		
12	2	Algorithm programming	Application with Python	Theory	Exam
13	2	Feature reduction	Linear discriminant analysis	Theory	Exam
14	2	Algorithm programming	Application with Python	Theory	Exam
15	2	Exam	Term Exam 2	Theory	

11. Course Evaluation
2 Quizzes: 8% (8) 2 Assignments: 2% (2) 2 Term Exam: 30% (30) 1 Final Exam: 60% (60)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Pattern Recognition And Machine Learning Christopher M. Bishop
	Soft Computing and its Applications by Kumar Ray

Course Description Form

1. Course Name:
Computer Graphics
2. Course Code:
CO408
3. Semester/Year:
Second/fourth
4. Description Preparation Date:
29/4/2026
5. Available Attendance Forms:
Physical attendance
6. Number of Credit Hours(Total)/Number of Units(Total)
60/4
7. Course administrator's name (mention all, if more than one name)
Name: Amar Daood Email: Amar.daood@uomosul.edu.iq Name: Dr.Sura Nawfal abdulrazzaq Email: Sura.nawfal@uomosul.edu.iq
8. Course Objectives

Course Objectives	● Be familiar with the basics of computer graphic operations. ● Learn the concepts and the principles of the Scan conversion. ● Understand and analyze the procedures of the Clipping Algorithm. ● Comprehend all the required Transformations in motion and the animated scenes.
9. Teaching and Learning Strategies	
Strategy	7- Apply knowledge of mathematics, science, and engineering. 8- Learn all basic mathematical behind computer graphic and animation design. 9- Ability to work effectively within multidisciplinary teams

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1,2	4	Understand basic operation of computer graphics	Introduction to computer graphics	lecture	Oral Exam
3,4	4	Learn DDA	DDA Algorithm	lecture	Oral Exam Homework

5,6	4	Learn BA	Bresenham Algorith	lecture	Homework
7,8	4	Learn SC	Scan convers Algorithm	lecture	Quiz
9,10	4	Understand clipping	Clipping Algorithm	lecture	Oral Exam
10	2	Learn Transformations	Transformations	lecture	Quiz
11	2	Learn openGL	Introduction OpenGL	lecture	Oral Exam Homework
12	2	Code in OpenGL	OpenGL programming	lecture	Oral Exam
13	2	Learn by examples	OpenGL examples	lecture	Oral Exam
14	2	Learn by application	OpenGL applicatio	lecture	Oral Exam
15					

11. Course Evaluation	
2 quizzes	5pts
3 homework	5pts
reports	5pts
Project	5pts
Term Exam	20pts
Final Exam	60pts
Total	100pts

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Computer Vision and Image Processing, By: Scott E. Umbaugh.
Main references (sources)	Introduction to Computer Graphics, By: F. M. Sprout.
Recommended books and references (scientific journals, reports)	Open G.L .- Silicon Graphics.
Electronic references, websites	

Course Description Form

1. Course Name:
Cyber Security
2. Course Code:
CYSE413
3. Semester/Year:
Second / Fourth
4. Description Preparation Date:
30/4/2026
5. Available Attendance Forms:
Lectures
6. Number of Credit Hours(Total)/Number of Units(Total):
30 Hours /2 Units
7. Course administrator's name
Name: Asst. Prof. Dr. Mayada Faris Ghanim Email: mayada.faris@uomosul.edu.iq

8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • Identify the main terminologies of Cyber security such as C-I-A triad and cryptography • Recognize the impact that malicious exploits and attacks have on network security • Comparing between different algorithms for encryption and other services of security • Evaluating the level of protection through the value of the encryption work factor • Analyzing the steps of encryption and decryption algorithms • Describing the ways of implementing access control • Describing the modes of IPSec security • Listing IPSec protocols and describing their principles of operation • Understanding the establishment of the security parameters via security association
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify the main terminologies of Cyber security	Introduction to Cyber Security	Theory	Exam

2	2	Identify the main terminologies of Cyber security	The OSI Security Architecture	Theory	Exam Quiz
3	2	Recognize the impact that malicious exploits and attacks have on network security	Authentication	Theory	Exam
4	2	Identify the main terminologies of Cryptography	Cryptography Principles	Theory	Exam
5	2	Evaluating the level of protection through the value of the encryption work factor	Work factor and Data Encryption Standard (DES) Part 1	Theory	Exam
6	2	Analyzing the steps encryption and decryption algorithms	Work factor and Data Encryption Standard (DES) Part 2	Theory	Exam Assignment
7	2	Analyzing the steps encryption and decryption algorithms	Advanced Encryption Standard (AES) Part 1	Theory	Exam
8	2		Term Exam 1	Theory	
9	2	Describing the ways of implementing access control	Access Control	Theory	Exam
10	2	Describing the modes of IPSec security	IP Security	Theory	Exam Quiz
11	2	Describing the types of Firewalls	Firewalls		
12	2	Understanding the importance of AI in network security	Introduction to Artificial intelligence in network security	Theory	Exam
13	2	Describing the main applications of using AI in network security	Artificial intelligent Applications in network security	Theory	Exam
14	2	Identify the principles and methods of security in OS	Security in operating system	Theory	Exam
15	2		Term Exam 2	Theory	

11. Course Evaluation	
2 Quizzes: 10% (10) 2 Term Exam: 30% (30) 1 Final Exam: 60% (60)	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• Charles P. Pfleeger, Shari Lawrence Pfleeger and Jonathan Margulies, "Security in Computing", Prentice Hall, fifth edition, ISBN-13: 978-0-13-408504-3, 2015. • William Stallings, "Cryptography and Network Security Principles and Practice", Pearson Education, seventh edition, ISBN 978-0-13-444428-4, 2017

Course Description Form

1. Course Name:	
Fundamentals of Mobile Systems	
2. Course Code:	
FUMS414	
3. Semester/Year:	
Second / Fourth	
4. Description Preparation Date:	
30/4/2026	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
(30 lectures+45 Laboratory) Hours /3 Units	
7. Course administrator's name	
Name: Asst. Prof. Dr. Mayada Faris Ghanim Email: mayada.faris@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • Understand the Evolution and Architecture of Mobile Systems: Describe the evolution of mobile communication systems from 2G to 5G, including their architectures, key components, and design principles. • Analyze Mobility in Wireless Networks: Identify and model different mobility patterns and evaluate their impact on mobile network performance. • Explain and Differentiate Multiple Access Techniques: Demonstrate a clear understanding of multiple access methods (FDMA, TDMA, CDMA, OFDMA, SC-FDMA), including their advantages, limitations, and suitability for different generations of mobile systems. • Compare Duplexing Techniques: Compare Frequency Division Duplexing (FDD) and Time Division Duplexing (TDD) in terms of efficiency, delay, and practical applications in 4G/5G systems. • Evaluate Handover Mechanisms: Understand and differentiate between hard, soft, and seamless handovers. • Explore Advanced 5G Technologies: Understand and discuss advanced concepts such as Massive MIMO, mmWave communication, network slicing, virtualization (NFV/SDN), and edge computing with AI integration in mobile networks. • Apply Simulation Tools for Access Techniques: Use simulation tools to implement and analyze various multiple access techniques under different network conditions. • Integrate Theoretical Knowledge with Practical Implementation: Combine theoretical understanding with lab simulations to develop critical thinking, problem-solving, and system analysis skills relevant

	to modern wireless networks.

9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify the main terminologies of Mobile Systems	Introduction to Mobile Systems	Theory and Lab	Exam
2	2	Recognize the impact of Mobility	Mobility models for Wireless Networks	Theory and Lab	Exam Quiz
3	2	Identify the main terminologies modern Cellular Networks	Fundamentals of modern Cellular Networks and their architectures	Theory and Lab	Exam
4	2	Evaluating the performance of Multiple Access Techniques	Multiple Access Techniques: FDMA, TDMA, CDMA (2G–3G)	Theory and Lab	Exam
5	2	Evaluating the performance of Multiple Access Techniques	Multiple Access Techniques: OFDMA and SC-FDMA (4G–5G)	Theory and Lab	Exam
6	2	Analyzing the steps of executing Multiple Access Techniques	Multiple Access Techniques: Comparison of access techniques	Theory and Lab	Exam, Assignment
7	2	Identify the main principles of FDD and TDD	Multiple Access Techniques: Duplexing: FDD vs TDD	Theory and Lab	Exam
8	2	Identify the main principles of Mobility and Handover Management	Mobility and Handover Management: Types of handover: hard, soft, seamless	Theory and Lab	Exam
9	2	Describing the ways of implementing mobile systems	QoS and Performance Metrics (key metrics): throughput, latency, jitter and QoS	Theory and Lab	Exam

			mechanisms in LTE and 5G		
10	2		Term Exam1	Theory and Lab	Exam
11	2	Understanding the importance of Massive MIMO and beamforming	Massive MIMO and beamforming		Exam
12	2	Understanding the importance of mmWave communication	mmWave communication	Theory and Lab	Exam
13	2	Describing the main applications of Network slicing and virtualization	Network slicing and virtualization (NFV/SDN)	Theory and Lab	Exam
14	2	Identify the principles and methods of Edge computing	Edge computing and AI in mobile networks	Theory and Lab	Exam
15	2		Term Exam 2	Theory and Lab	Exam

11. Course Evaluation
2 Quizzes: 10% (10) 2 Term Exam: 30% (30) 2 Lab Exam: 15% (15) 1 Final Exam: 50% (50)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• 3rd Generation Partnership Project (3GPP) technical specifications (LTE & 5G NR releases) • 5G NR: The Next Generation Wireless Access Technology – Erik Dahlman, Stefan Parkvall, Johan Skold • LTE for UMTS: Evolution to LTE-Advanced – Harri Holma, Antti Toskala • Fundamentals of 5G Mobile Networks – Jonathan Rodriguez

Course Description Form

1. Course Name:					
Image Processing and Applications					
2. Course Code:					
IMPA415					
3. Semester/Year:					
Second / Fourth					
4. Description Preparation Date:					
2026					
5. Available Attendance Forms:					
Lectures					
6. Number of Credit Hours(Total)/Number of Units(Total):					
30 Hours /2 Units					
7. Course administrator's name					
Name: Dr. Ula Tarik Salim Email: ula.tariq@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	• The course covers the basic theories and algorithms that are widely used in digital image processing and application. • Expose students to current technologies and issues that are specific to image processing systems. Where in this course students will learn digital image processing techniques including representation, sampling and quantization, image acquisition, imaging geometry, Noise and blur types and causes, image restoration models, image transforms, image enhancement, image smoothing and sharpening, image restoration and image compression. • as well as its applications in biometric field.				
9. Teaching and Learning Strategies					
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify a wide-range of image processing techniques and applications.	Introduction & Fundamentals of digital Image processing and applications.	Lecture	Exam
2	2	Describe how digital images are represented, manipulated, encoded, compressed and	Image analysis, preprocessing, ROI, Image Algebra.	Lecture	Homework, Exam

		processed.			
3	2	Understanding image types, Spatial Filters and Image quantization methods.	Spatial Filters	Lecture	Quiz, Exam
4	2	Applying the edge detection, operators and masks on images.	Edge detection.	Lecture	Homework, Exam
5	2	Explain the purpose of each process and the underlying mathematical principles.	Image quantization methods.	Lecture	Quiz, Exam
6	2	Applying the edge detection, operators and masks on images.	Operators, Masks.	Lecture	Exam
7	2	Analyzing noise and blur types.	Noise and blur in images & removals	Lecture	Homework, Quiz, Exam
8	2	Executing and designing appropriate image restoration systems.	System model, Image restoration, Measurements of image quality.	Lecture	Exam
9	2	Comparing image compression and decompression methods.	Image Compression types	Lecture	Exam
10	2		Term Exam 1		
11	2	Implementing image compression and decompression methods.	Image coding.	Lecture	Homework, Quiz, Exam
12	2	Monitoring recent developments in the field of image transforms and biometric application.	Discrete Transform (FFT, Cosine transforms and Wavelet transform)	Lecture	Exam
13	2	Implementing image compression and	JPEG & JPEG 2000	Lecture	Exam

		decompression methods.			
14	2	itoring recent developments in the field of image transforms and biometric application.	Introduction to biometric systems types and applications.	Lecture	Report
15	2		Term Exam 2		

11. Course Evaluation
4 Quizzes: 10% (10) 4 Assignments: 2% (2) 1 Report 3%(3) 2 Term Exam: 25% (25) 1 Final Exam: 60% (60)

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• Gonzalez, Rafael C._ Woods, Richard E. - Digital image Processing • Lectures and notes

Course Description Form

1. Course Name:	
Applied Sciences	
2. Course Code:	
ELCO416	
3. Semester/Year:	
Second / Fourth	
4. Description Preparation Date:	
29/4/2026	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
30 Hours /3 Units	
7. Course administrator's name	
Name: Asst. Prof. Dr. Ina'am Fathi Khudher Email: inam.fathi@uomosul.edu.iq Name Dr. Basman Mahmood Hasan Email: Bm.alhafidh@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	Upon successful completion of this module, students will be able to demonstrate the following competencies, structured according to Bloom's Taxonomy of cognitive learning levels: • Recall, define, and explain fundamental concepts in applied physics, materials science, and thermodynamics as they relate to computing hardware and electronic systems. (LO1) • Identify a wide-range of applied sciences techniques, describe how these techniques are formed, represented, used and processed.(LO1) • In addition, understanding how it applied to practical applications.(LO1)
9. Teaching and Learning Strategies	
Strategy	This module employs a blended learning approach that combines formal lectures, class power point presentations, and self-directed study to accommodate diverse learning styles among senior engineering students. Lectures are designed to deliver core theoretical content using interactive presentations, worked examples, and real-world case studies drawn from contemporary computing technologies. Laboratory and practical sessions provide students with hands-on experience in applying scientific principles to experimental tasks, reinforcing conceptual understanding through empirical observation and measurement. Formative assessment activities, including quizzes, short reports, P.P presentation, and peer discussion, are embedded within teaching sessions to provide continuous feedback and monitor student progress against the stated learning outcomes.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Identify the main Applied sciences principles	Introduction	Theory	Exam
2	3	Identify the main Advanced Mathematical Methods, Numerical analysis, Optimization methods, Transform methods	Advanced Mathematics	Theory	Exam
3	3	Recognize the impact of errors in numerical analysis	Error	Theory	Exam
4	3	Identify the main applications of Fourier transform in applied sciences	Fourier Transform	Theory	Exam Quiz
5	3	Illustrating the main Optimization Methods : Gradient Descent, Genetic Algorithms, Simplex Method, Particle Swarm Optimization, and Brute Force)	Optimization Methods	Theory	Exam
6	3	Illustrating Neural network training Techniques covering four core technique categories: root finding, numerical integration, differential equation solvers, and matrix computations)	Numerical Analysis Techniques	Theory	Exam Quiz
7	3	Introduces Data Science as an applied science field	Data Sciences	Theory	Exam Assignments
8	3	Introduces remote sensing as the science of obtaining information about Earth from a distance using — both passive measuring and active measuring)	Remote Sensing	Theory	Exam
9	3	Identifying Programming building algorithms, Databases , intelligent repositories (like Netflix and Amazon), and Networking (the wired and wireless infrastructure),	Information Technology Applications	Theory	Exam

		Cybersecurity.			
10	3	Understanding the main Thermodynamics & Energy laws (Zeroth Law, First Law, Second Law, and the Third Law	Thermodynamics & Energy Systems	Theory	Exam
11	3	Understanding the main Electromagnetic Theory laws (Maxwell's Equations — Gauss's Law for Electricity, Gauss's Law for Magnetism,)	Electromagnetic Theory	Theory	Exam
12	3	Understanding the principles of engineering, medicine, and artificial intelligence	Biomedical Engineering tissue).	Theory	Exam Assignments
13	3	General Review	General Review	Theory	Exam
14	3	Discussion	Discussion	Theory	Exam Presentation
15	3		Term Exam	Theory	
11. Course Evaluation					
2 Quizzes: 10% (10) 2 Assignments: 10% (10) 1Presentation: 10% (10) 1 Term Exam: 10% (10) 1 Final Exam: 60% (60)					
12. Learning and Teaching Resources					
Required textbooks(curricular books, if any)					