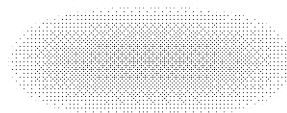**Ministry of Higher Education and Scientific Research**
Scientific Supervision and Scientific Evaluation
Apparatus Directorate of Quality Assurance and
Academic Accreditation Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), 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 regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of 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: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Mosul

Faculty/Institute: College of Engineering

Scientific Department: Computer Department

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

Final Certificate Name: Bachelor's in Computer Engineering

Academic System: Bologna

Description Preparation Date: 5/4/2024

File Completion Date: 5/4/2024

Signature: Signature:

Head of Department   Scientific Associate

Name: Date: Name: Date

The file is checked by:

Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance

Department: Date:

Signature:

Approval of the Dean

1. Program Vision

The Department of Computer Engineering be distinguished by preparing qualified engineers and researchers with modern information to meet society's needs and create scientific research that maintains pace with advances in computer engineering and its applications.

2. Program Mission

Distinguished education, solid scientific research, and community service.

3. Program Objectives

1. Preparing engineers with a high level of knowledge and skill capable of building computer systems, analyzing and developing them, while following up them after graduation.

2. Continuing to follow up the curricula to keep pace with scientific development in a manner that suits the needs of the labor market by adopting quality standards and using the latest methods.

3. Working to keep abreast of the latest scientific research in various specializations within the lecturers research and theses of postgraduate students.

4. Organizing seminars and holding scientific conferences and workshops with the colleges, government institutions and the private sector to solve problems and develop the work of these institutions.

5. Providing academic, technical and scientific consultations in the fields of computer engineering to all governmental and private sectors of society.

6. Guiding the students to teamwork, generating intrinsic motivation, keenness to find and understand the knowledge necessary to succeed in the tasks entrusted to them in the future, and aspiration to keep pace with the most prestigious scientific institutions in the field of computer engineering, and to adhere to professional ethics.

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				
College Requirements				

Department Requirements	48	223		
Summer Training				The student must complete 4 weeks of summer training to fulfill the requirements for the bachelor's degree
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
2023-2024/first	CO101	English Language	٢	.
2023-2024/first	CO102	Democracy and Human Rights	٢	.
2023-2024/first	CO103	Mathematics 1	٤	.
2023-2024/first	CO104	Engineering Drawing by Computer	.	٣
2023-2024/first	CO105	Electrical Circuits Analysis1	٤	٣
2023-2024/first	CO106	Electronics Physics	٤	.
2023-2024/first	CO107	Computer	٢	١
2023-2024/second	CO108	Programing using C++ Language	٣	٣
2023-2024/second	CO109	Arabic Language	٢	.
2023-2024/second	CO110	Mathematics 2	٥	.
2023-2024/second	CO111	Electrical Circuits Analysis 2	٤	٣
2023-2024/second	CO112	Digital System Fundamentals	٣	٣
2024-2025/first	CO201	Engineering Mathematics 1	٤	.
2024-2025/first	CO202	Analog Electronics	٣	٣
2024-2025/first	CO203	Microprocessors 1	٢	٣
2024-2025/first	CO204	English Language-Pre-intermediate	٢	.
2024-2025/first	CO205	Object Oriented Programing	٢	٣

Year/Semester	Code	Course Name		
2024-2025/first	CO206	Programmable Logic Design using HDL	٢	٣
2024-2025/second	CO207	Computational Methods for Data Analysis	٣	.
2024-2025/second	CO208	Engineering Mathematics 2	٤	.
2024-2025/second	CO209	Engineering Management	٢	.
2024-2025/second	CO210	Digital Electronics	٣	٣
2024-2025/second	CO211	Microprocessors 2	٢	٣
2024-2025/second	CO212	Data Structures	٣	٣
2025-2026/first	CO301	Data Communications	٣	٣
2025-2026/first	CO302	Signals and Systems	٣	.
2025-2026/first	CO303	Computer Architecture I	٣	.
2025-2026/first	CO304	Computer Interface	٢	٣
2025-2026/first	CO305	Operating Systems I	٢	٣
2025-2026/first	CO306	Artificial Intelligence Principles	٢	.
2025-2026/second	CO307	Computer Networks	٣	٣
2025-2026/second	CO308	Digital Signal Processing	٣	.
2025-2026/second	CO309	Computer Architecture 2	٣	.
2025-2026/second	CO310	Embedded Systems	٢	٣
2025-2026/second	CO311	Operating Systems 2	٢	٣
2025-2026/second	CO312	English Language Intermediate	٢	.
2026-2027/first	CO401	Professional Ethics	١	.
2026-2027/first	CO402	Fundamentals of Control Systems	٤	٣
2026-2027/first	CO403	Real Time Systems	٢	٣
2026-2027/first	CO404	Elective Course	٢	.
2026-2027/first	CO405	Wireless Networks	٢	٣
2026-2027/first	CO406	Parallel Computer Architecture	٣	.
2026-2027/second	CO407	Graduate Project		
2026-2027/second	CO408	Computer Graphics	٢	.
2026-2027/second	CO409	Cyber Security	٢	.
2026-2027/second	CO410	Moblie Systems	٢	٣

		Fundimentals		
2026-2027/second	CO411	Image Processing and Applications	٢	٠
2026-2027/second	CO412	English language- Upper Intermediate	٢	٠

8. Expected learning outcomes of the program

Knowledge	
The graduates will use their knowledge and abilities to grow in their employment or pursue higher.	

Skills	
The graduates will be innovative problem solvers, competent communicators, and successful members of inclusive, diverse teams.	
The graduates will successfully execute hardware- and/or software-related engineering projects to satisfy client business objectives and/or productively engage in research by applying the concepts and practices of computing anchored in mathematics and science.	

Ethics	
The graduates will act morally and responsibly, stay informed, and be actively committed as contributors to their professions and societies.	

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 Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	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 Mmebers

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Qutaiba Ibrahim Ali	Computer Engineering	computer networks		Staff	
Shefa Abdulrahman Dawwd	Computer Engineering	Architecture of real-time applications and neural networks		Staff	
Ahmed Mamoon Fadhil Alkababji	Computer Engineering	Real time and signal processing		Staff	
Ahlam Fadhi IMahmood	Computer Engineering	Architecture		Staff	
Salah Abdulghani Jaro	Computer Engineering	computer networks		Staff	
Rabee M. Hagem	Computer Engineering	embedded wireless communications		Staff	
Mayada Faris Ghanim	Computer Engineering	Computer networks and communications		Staff	
Turkan Ahmed Khaleel	Computer Engineering	computer networks		Staff	
Sahar Khalid	Computer	Image		Staff	

Ahmed	Engineering	Processing			
Dhafir Abdulfattah Abdulqader	Computer Engineering	Computer architecture		Staff	
Modhar Ahmed Hammoudy	Computer Engineering	Electronic and communications engineering		Staff	
Amar idrees daood	Computer Engineering	signal processing and Real time		Staff	
Ina'am Fathi Khudher	Computer Engineering	computer networks		Staff	
Sura Nawfal Abd_Alrazzaq	Computer Engineering	Computer graphics		Staff	
Zahraa Tala Abed	Computer Engineering	Computer Engineering		Staff	
Sura Ramzi Sharif	Computer Engineering	computer science		Staff	
Akram Abdul maujood dawood	Computer Engineering	Computer architecture and communications		Staff	
Ali Mukhlif Ahmed	Computer Engineering	Signal processing		Staff	
Basman Mahmood Hasan Alhafidh	Computer Engineering	embedded systems		Staff	
Mazin Hashim Aziz Ali	Computer Engineering	Image processing and human communication		Staff	

		systems			
Shawkat Sabah Khairullah	Computer Engineering	Computer architecture and approved systems		Staff	
Nada Ismail Najim	Computer Engineering	Computer and communications networks		Staff	
Samar Ammar Yasir	Computer Engineering	Digital signal processing		Staff	
Ola Tariq	Computer Engineering	Computer Engineering		Staff	
Noor mowfeq	Computer Engineering	Computer Engineering		Staff	
Mustafa Seham Abdel Rahman	Computer Engineering	Computer Engineering		Staff	
Jumana Abdullah Karim	Computer Engineering	Communications and optical networks		Staff	
Muhanad Faris Saleh alatallah	Computer Engineering	Computer Engineering		Staff	
Hussein Mahmood Mohammed	Computer Engineering	Computer Engineering		Staff	
Qasim Abdullah Ahmed	Computer Engineering	Computer technologies Engineering		Staff	
Farah Nazar Ibraheem	Computer Engineering	Computer Engineering		Staff	

1

Hothayfa Rabea Mohammed	Computer Engineering	Computer Engineering		Staff	
Joan Atheel Akrawi	Computer Engineering	Sustainable urban design		Staff	
Hayfaa Ahmed	Computer Engineering	Computer Engineering		Staff	
Shaymaa nazar aljarah	Computer Engineering	Computer teaching methods		Staff	
Ola Marwan Assim	Computer Engineering	Computer technologies and networks		Staff	
Hamed abd ul aziz mahmood	Computer Engineering	Computer Engineering		Staff	
Hassan Fakhry Hassan	Computer Engineering	Computer Engineering		Staff	
Noor Salah	Computer Engineering	Computer Engineering		Staff	
Mohammad Tarik Mohammad	Computer Engineering	Computer Engineering		Staff	
Lubna Mzahim	Computer Engineering	Drawing on the computer		Staff	
Farah Natiq	Computer Engineering	Computer Engineering		Staff	
Hiba Dhyaa	Computer Engineering	Computer Science		Staff	
Ahmed Samir Ahmed	Computer Engineering			Staff	

Warqaa younis Ibrahim	Computer Engineering	Control and computers		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

<table>
<thead>
<tr><th colspan="15" align="center">Program Skills Outline</th></tr>
<tr><th></th><th></th><th></th><th></th><th colspan="11" align="center">Required program Learning outcomes</th></tr>
<tr><th rowspan="2">Year/Level</th><th rowspan="2">Course Code</th><th rowspan="2">Course Name</th><th rowspan="2">Basic or optional</th><th colspan="4">Knowledge</th><th colspan="4">Skills</th><th colspan="3">Ethics</th></tr>
<tr><th>A1</th><th>A2</th><th>A3</th><th>A4</th><th>B1</th><th>B2</th><th>B3</th><th>B4</th><th>C1</th><th>C2</th><th>C3</th><th>C4</th></tr>
</thead>
<tbody>
<tr><td></td><td>CO101</td><td>English Language</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO102</td><td>Democracy and Human Rights</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO103</td><td>Mathematics 1</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO104</td><td>Engineering Drawing by Computer</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO105</td><td>Electrical Circuits Analysis1</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO106</td><td>Electronics Physics</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO107</td><td>Computer</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO108</td><td>Programing using C++ Language</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td>●</td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO109</td><td>Arabic Language</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO110</td><td>Mathematics 2</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO111</td><td>Electrical Circuits Analysis 2</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td>●</td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO112</td><td>Digital System Fundamentals</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td>●</td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO201</td><td>Engineering Mathematics 1</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO202</td><td>Analog Electronics</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO203</td><td>Microprocessors 1</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td>●</td><td>●</td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
<tr><td></td><td>CO204</td><td>English Language- Pre-intermediate</td><td>Basic</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>●</td><td></td><td></td><td></td></tr>
</tbody>
</table>

Code	Course	Type	1	2	3	4	5	6	7	8	9	10	11
CO205	Object Oriented Programing	Basic	●				●	●			●		
CO206	Programmable Logic Design using HDL	Basic	●				●	●			●		
CO207	Computational Methods for Data Analysis	Basic	●				●						
CO208	Engineering Mathematics 2	Basic	●				●						
CO209	Engineering Management	Basic	●								●		
CO210	Digital Electronics	Basic	●				●	●			●		
CO211	Microprocessors 2	Basic	●				●	●			●		
CO212	Data Structures	Basic	●				●				●		
CO301	Data Communications	Basic	●				●	●			●		
CO302	Signals and Systems	Basic	●				●						
CO303	Computer Architecture I	Basic	●				●	●			●		
CO304	Computer Interface	Basic	●				●						
CO305	Operating Systems I	Basic	●				●						
CO306	Artificial Intelligence Principles	Basic	●				●						
			●				●	●			●		
CO307	Computer Networks	Basic	●				●	●			●		
CO308	Digital Signal Processing	Basic	●				●	●			●		
CO309	Computer Architecture 2	Basic	●				●						
CO310	Embedded Systems	Basic	●				●						
CO311	Operating Systems 2	Basic	●								●		
CO312	English Language Intermediate	Basic											
			●								●		
CO401	Professional Ethics	Basic	●				●	●			●		
CO402	Fundamentals of Control Systems	Basic	●				●	●			●		

Code	Course	Level	1	2	3	4	5	6	7	8	9	10	11	12
CO403	Real Time Systems	Basic	●			●								
CO404	Elective Course	Basic	●			●	●			●				
CO405	Wireless Networks	Basic	●			●	●			●				
CO406	Parallel Computer Architecture	Basic												
CO407	Graduate Project	Basic	●			●	●			●				
CO408	Computer Graphics	Basic	●			●				●				
CO409	Cyber Security	Basic	●			●								
CO410	Moblie Systems Fundimentals	Basic	●			●				●				
CO411	Image Processing and Applications	Basic	●							●				
CO412	English language- Upper Intermediate	Basic	●			●	●			●				

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

Course Description Form

1. Course Name:
English Language

2. Course Code:
CO101

3. Semester/Year:
1 / 2023-2024

4. Description Preparation Date:
29/3/2024

5. Available Attendance Forms:
In class

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. Mustafa Siham Abdulrahman Qassab Email: mustafa.qassab@uomosul.edu.iq ....

8. Course Objectives

Course Objectives	- Developing further knowledge of the grammar and of essential vocabulary. - Improving listening, speaking, reading and writing skills. - Focusing on grammar and fundamental writing skills.
Required Learning Outcomes	Evaluation method

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
Week1	4	CLO 1: An ability to acquire and apply new knowledge and using appropriate learning strategies.	UNIT 1 A world of difference: part 1	Theory Lecture Lab Practical Seminar	Quizzes Assignments Reports Online Assessment Paper Exam
Week2	4				
Week3	4				
Week4	4	CLO 2: An ability to participate and work professionally and ethically in different projects to function on multi-disciplinary teams.	UNIT 1 A world of difference: part 2		
Week5	4				
Week6	3				
Week7	3				
Week8	3				
Week9	3	CLO 3: Comprehend and analyze various written and spoken texts: Demonstrate the ability to understand the main ideas, key details, and nuances of different types of texts, including articles, essays, speeches, and dialogues.	UNIT 1 A world of difference: part 3		
Week10	3		UNIT 2 The working week: part 1		
Week11	3				
Week12	3				
Week13	3		UNIT 2 The working week: part 2		
Week14	3		UNIT 2 The working week: part 3		
Week15	3	CLO 4: Communicate effectively in spoken interactions: Engage in short conversations using appropriate language and effective communication	UNIT 3 Good times, bad		

		strategies. Express ideas, opinions, and experiences clearly and coherently. Demonstrate active listening skills and respond appropriately to others.	times: part 1 UNIT 3 Good times, bad times: part 2 UNIT 3 Good times, bad times: part 3 Online assessment Group1 Online assessment Group2 Online assessment Group3 Online assessment Group4 Reviewing the Units 1–3 and open discussion Midterm exam		
		CLO 5: Produce well–structured written texts: Generate logically organized and cohesive paragraphs in written assignments. Apply appropriate grammar, vocabulary, and sentence structures to enhance clarity and coherence. Use effective writing strategies such as introductions, topic sentences, transitions, and conclusions.			
		CLO 6: Employ appropriate vocabulary and expressions: Select and use a wide range of vocabulary to accurately express feelings, opinions, and personal experiences. Recognize, understand, and utilize phrasal verbs and collocations to enhance language fluency and natural			

| | | expression.

CLO 7: Apply effective language organization and coherence: Demonstrate the ability to structure and organize written and spoken communication effectively. | | | |
|---|---|---|---|---|---|

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such quizzes, assignments, reports, online assessment, paper exam.

12. Learning and Teaching Resources

Required textbooks(curricular books, if any)	SOARS, J. & SOARS, L. 2014. New Headway: Intermediate Fourth Edition: Student's Book and iTutor Pack, OUP Oxford.
Main references (sources)	
Recommended books and references (scientif journals, reports)	
Electronic references, websites	

Course Description Form

13. Course Name:	
Human rights	
14. Course Code:	
UOM104	
15. Semester/Year:	
Second, first year	
16. Description Preparation Date:	
27/3/2024	
17. Available Attendance Forms:	
Obligatory (in person)	
18. Number of Credit Hours(Total)/Number of Units(Total)	
2	
19. Course administrator's name (mention all, if more than one name)	
Name: Lana Mohammad Mayoof Email: lana.mayoof@uomosui.edu.iq	

20.	Course Objectives	
	Course Objectives	• Contributing to the protection and promotion of human rights by taking both immediate and long term measures………….
		• Empowering residents to demand their human rights…………
		• Enabling the state and other national institutions to implement their obligations in the in the field human rights and uphold the law…………
21.	Teaching and Learning Strategies	

Strategy	

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	Learn about the concept of the term human rights	The concept of human rights	Explain the term human rights	Theoretical exam
2	4	Characteristics of human rights	Human right generations	Explain the characteristics of human rights	Theoretical exam Theoretical exam
3	4	Human rights in ancient civilizations	Ashnunna Law	Explain those Laws	
4	4		Hindu, Chinese and Greek		Theoretical exam
		Human Rights in Eastern civilizations		Explain the Human rights in those civilizations	
5	4		civilization		exam
			Explain the Human rights in	Explain the	Theoretical
6	4	Human Rights in Roman civilizations	Roman civilizations	Human rights in Roman civilizations	exam Theoretical exam
7	4		Judaism, Christianity and	Explain the	Theoretical exam

14

		Human rights heavenly religions	Islam Explain Women's rights	Human rights in those religions	
8	4				Theoretical Exam
9	4	Women's rights in Islam	Medieval concept Concept of modern ages		Theoretical Exam
1	4	Human rights in middle ages			
1	4				
1	4	Human rights in modern ages			
1	4	Human rights in America			
1	4	Human rights in England			
1	4	Human rights in France	Charter of the United States		
1	4	Gironda project concept Contemporary history Semester exam		International recognition of human rights	

23. 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

Daily preparation and daily exams 10% Home works 10% Reports 10% Seminars 10% Daily exam 10% Final Exam 50%	
24. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Qais Hatim Hani AlJanabi, Tributaries of human rights in the ancient history of Iraq
Main references (sources)	
Recommended books and references (scientific journals, reports)	
Electronic references, websites	Nothing

Course Description Form

1. Course Name:
Mathematics 1

2. Course Code:
CO103

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. Samar Ammar Yasir Email: samarammar@uomosul.edu.iq Name: Dr. Hussein Mahmood Mohammed Email: hussein.mahmood@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
Week 1	5	Apply and understand the fundamental of coordinates and graphs in the plane. Slope, and equations for lines. Circles and parabolas graphs.	Coordinates and graphs in the plane. Slope, and equations for lines. Circles and parabolas.[ch1]	Lecture & Tutorial	Oral exam
Week 2	5	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	Oral exam Home work
Week 3	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
Week 4	5	Explain the fundamental of limits and sandwich theorem. .	Limits of functions. The sandwich theorem [ch2] + quiz	Lecture & Tutorial	Quiz Oral exam

Week 5	5	Explain the concept of limits involving infinity. Continuity and their implications in mathematical analysis.	Limits involving infinity. Continuous functions [ch2]	Lecture & Tutorial	Home work
Week 6	5	Demonstrate and compute derivatives of functions using various techniques.	Slope, tangent lines, and derivatives. Differentiation rules. Derivatives of trigonometric functions. [ch3] +quiz	Lecture & Tutorial	Quiz
Week 7	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. Linear approximations and differentials .[ch3]	Lecture & Tutorial	Oral exam Home work
Week 8	5	Understand the geometric interpretation of vectors and apply the properties of vector operations.	Vector Operations using Graphical methods and Algebraic methods. Properties of vector operations. magnitude and direction of vectors. Vector Decomposition. [ch12]+quiz	Lecture & Tutorial	Quiz
Week 9	5	Understand the vector operations to solve problems involving vectors in the plane and in three-dimensional space.	Unit vector in 2D and 3D space. Dot product and Cross product of vectors and their properties.[ch12]	Lecture & Tutorial	Home work
Week 10	5		Mid exam		Exam

Week 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	Oral exam
Week 12	5	Identify and demonstrate operations of matrices.	Operations of matrices such as transposition, determinant, adjoin and inverse matrix. .[ch8]	Lecture & Tutorial	Oral exam Home work
Week 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
Week 14	5	Solve systems of linear equations using Gaussian elimination.	Gaussian elimination method. [ch8]	Lecture & Tutorial	Quiz Home work
Week 15	5		**Final exam**		Exam

11. Course Evaluation:

		Quizzes	4	20% (20)	
		Assignments	8	16% (16)	
		Report	1	4% (4)	
		Midterm Exam	2 hr	10% (10)	

Required Textbooks: Calculus by Thomas and Finny.
Main reference : Lectures and notes
Recommended Textbooks: Thomas' Calculus: Early Transcendentals 13th Edition by George B. Thomas.

Course Description Form

1. Course Name:
Engineering Drawing by Computer

2. Course Code:
CE104

3. Semester/Year:
First semester / First year

4. Description Preparation Date:
30-3-2024

5. Available Attendance Forms:
On Class

6. Number of Credit Hours(Total)/Number of Units(Total)
100/4

7. Course administrator's name (mention all, if more than one name)
Name: Joan Atheel Ahmed Jumana Abduallah Farah Nazar Akram abdalmaoujod Email: Joan.akrawi@uomosul.edu.iq jumana.abdullah@uomosul.edu.iq farah_nazar80@uomosul.edu.iq

8. Course Objectives	
Course Objectives	The aims of the module are: (1) to develop a knowledge of both manual and computer-generated engineering drawing. (2) to create, edit and print a variety of technical drawings using a CAD system. (3) to communicate design ideas and technical information to engineers and other professionals throughout the design process (4) An engineering drawing represents a comp three-dimensional object on a two-dimensional piec paper or computer screen by a process called project

9. Teaching and Learning Strategies

Strategy		Type something like: The main strategy that will be adopted delivering this module is to encourage students' participation in exercises, while at the same time refining and expanding their criti thinking skills. This will be achieved through classes, interact 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
Week 1	4	Proficiency in AutoCAD: Gain a comprehensive understanding of AutoCAD software, its basic commands, and tools necessary for professional 2D drawing, design, and drafting	Lab 1: Getting started: 1- Start a new drawing. 2- User Interface. 3- Drafting settingsI (Snap, Rectangular & Isometric grid). 4- Limits. 5- Units. 6- Absolute & Relative coordinate system. 7- Ortho	Lab	Oral exam
Week 2	4	Proficiency in AutoCAD: Gain a comprehensive understanding of AutoCAD software, its basic commands, and tools necessary for professional 2D drawing, design, and drafting	Lab 2: Drawing I1- Point (DDPTYPE = POINT STYLE). 2- Line, Arc, Circle, Ellipse, Polygon, Rectangle	Lab	Quiz
Week 3	4	Application of Drawing Commands: Acquire the ability to utilize various drawing commands in AutoCAD, including lines, circles, arcs, ellipses, polygons, and other geometric shapes, to create accurate and precise 2D drawings.	Lab 3: Drawing II, View. 1- Zoom, Pan, Steering wheel. 2- Drafting settingsII.(Osnap, Polar snap). 3- Pline, Pedit. 4- Erase. 5- Selecϴng objects. 6- Ltype, Ltscale	Lab	Oral exam Home work

	4	Application of Drawing Commands: Acquire the ability to utilize various drawing commands in AutoCAD, including lines, circles, arcs, ellipses, polygons, and other geometric shapes, to create accurate and precise 2D drawings.	Lab 4: ModifyI, Drawing III: 1-Copy, Rotate, Move, Scale, Stretch. 2-Undo, U, Redo. 3-Divide, Measure	Lab		Quiz
Week 4						
Week 5	4	Modification and Editing Techniques: Develop skills in modifying and editing drawings by employing commands such as erase, trim, extend, mirror, lengthen, offset, chamfer, fillet, and other relevant tools to refine and adjust the design as required.	Lab 5: Layers, Modify II: 1- Working with Layers. 2- Properties (Mo, Ch)... 3- Working with Grips. 4- Align	Lab		Oral exam Home work
Week 6	4	Modification and Editing Techniques: Develop skills in modifying and editing drawings by employing commands such as erase, trim, extend, mirror, lengthen, offset, chamfer, fillet, and other relevant tools to refine and adjust the design as required.	Lab 6: Modify III. 1-Array, Offset, Fillet, Chamfer, Trim, Extend, Lengthen, Mirror, Break, Join, Explode.	Lab		Quiz
Week 7	4	Dimensioning and Annotation: Understand the principles of dimensioning and annotation in engineering drawings. Learn to apply dimensioning commands, create text, use different font types, and utilize dimension styles to	Lab 7: Annotation I, Modify IV, Inquiry: 1-Style, Text, Mtext, Ddedit, 2- ID, Dist, Area, Massprop	Lab		Quiz

		accurately convey measurements and annotations.			
Week 8	4	Mid Exam .		Lab	Exam
Week 9	4	Dimensioning and Annotation: Understand the principles of dimensioning and annotation in engineering drawings. Learn to apply dimensioning commands, create text, use different font types, and utilize dimension styles to accurately convey measurements and annotations.	Lab 10: Hatch, Hatchedit.. 2- tool paleΣes 2	Lab	Quiz Oral exam Home work
Week 10	4	Quiz	Lab 11: Block I: 1- Block, Insert. 2- Wblock. 3- AΣributes, Block Editor. 4- Image, Draworder	Lab	Quiz Oral exam Home work
Week 11	4	Advanced Features and Techniques: Explore advanced features and techniques in AutoCAD, including working with layers, using design templates, inserting and managing blocks, working with 3D models, applying shading and better visibility commands, and utilizing design	Lab 12: Block II: Parametric constraints. 2- Dynamic Block. 3- Tool paleΣes. 4- Jpgout, Bmpout.	Lab	Oral exam Home work

		center and other relevant tools.			
Week 12	4	Advanced Features and Techniques: Explore advanced features and techniques in AutoCAD, including working with layers, using design templates, inserting and managing blocks, working with 3D models, applying shading and better visibility commands, and utilizing design center and other relevant tools.	Plot Drawings: 1- Mspace, Pspace. 2- Mviewport. 3- Layouts. 4- Plot.	Lab	Quiz
Week 13	4	Dimensioning and Annotation: Understand the principles of dimensioning and annotation in engineering drawings. Learn to apply dimensioning commands, create text, use different font types, and utilize dimension styles to accurately convey measurements and annotations.	Quiz 2	Lab	Oral exam Home work
Week 14	4	Dimensioning and Annotation: Understand the principles of dimensioning and annotation in engineering drawings. Learn to apply dimensioning commands, create text,	Plot Drawings: 1- Mspace, Pspace. 2- Mviewport. 3- Layouts. 4- Plot.	Lab	Quiz

		use different font types, and utilize dimension styles to accurately convey measurements and annotations.			
Week 15	4	Final Exam		Lab	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

Quizzes	8	16% (16)
Assignments	2	10% (10)
Projects / **Lab**.	1	10% (10)
Report	1	4% (4)
Midterm Exam	2 hr	10% (10)

12. Learning and Teaching Resources

Required textbooks(curricular books, if any)	Engineering Drawing and Graphic Technology, By: French &Vierk , 12th edition, 1978 AutoCAD, 2021
Main references (sources)	
Recommended books and references (scientific journals, reports)	Engineering Drawing, ©2005 by Wuttet Taffesse, Laikemariam Kassa
Electronic references, websites	

Course Description Form

25.	Course Name:
Electrical Circuits Analysis 1	

26.	Course Code:
CO105	

27.	Semester/Year:
First semester / First year	

28.	Description Preparation Date:
31/3/2024	

29.	Available Attendance Forms:
In class / on meet	

30.	Number of Credit Hours(Total)/Number of Units(Total)
175/7	

31.	Course administrator's name (mention all, if more than one name)
Name: Dr Ahmed Mamoon Fadhil Email: ahmedalkababji72@uomosul.edu.iq	

32.	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

33.	Teaching and Learning Strategies
Strategy	The main strategy that will be adopted in delivering this module is encourage students' participation in the exercises, while at the sa time refining and expanding their critical thinking skills. This will achieved through classes, interactive tutorials and by considering ty

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
		of simple experiments involving some sampling activities that are interesting to the students.			

34. Course Structure

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

Week 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
Week 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
Week 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
Week 7	7	Understand the characteristics of AC signals, including concepts related to frequency, amplitude, phase, and waveform	AC signals.[ch8] +quiz	Lecture	Quiz
Week 8	7		Mid exam		Exam
Week 9	7	Analyze AC	AC circuits: capacitance	Lecture	Quiz Oral exam

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

Week 13	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]	Lecture	Oral exam Home work
Week 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
Week 15	7	all	Preparatory week before the final Exam		

35.
Quizzes 16%, Onsite Assignments 10%, Projects/Lab 10%, Reports 4%, Midterm Exam 10%, Final Exam 50%.

36. 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

37.Course Name:	
Electronics Physics	
38.Course Code:	
CO106	
39.Semester/Year:	
1/2024	
40.Description Preparation Date:	
27/3/2024	
41.Available Attendance Forms:	
Face to face	
42.Number of Credit Hours(Total)/Number of Units(Total)	
4 hours and 3 units	
43.Course administrator's name (mention all, if more than one name)	
Name: Nada Ismaial Email: nada.ismail@uomosul.edu.iq	

44.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.

45.Teaching and Learning Strategies

Strategy	Encourage the students to participate in different activities such as solving questions through critical and logical thinking.

46. 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	Theoretical and practical test with written and

				presentation of the subject	oral quizzes
2	4	Semiconductor Materials	Explain the semiconductor materials	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	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 presentation of the subject	Theoretical and practical test with written and oral quizzes
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	Theoretical and practical test with written and

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 presentation of the subject	Theoretical and practical test with written and 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

47. 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 10%
Assignments 10%
Report 10%
Projects 10%
Pre-final test 10%
Final theoretical and practical test 50%

48. Learning and Teaching Resources

Required textbooks(curricular books, if any)	١. فيزياء الإلكترونيات، وكاع الجبوري ٢. 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

49. Course Name:	
Computer	

50. Course Code:	
CO107	

51. Semester/Year:	
One/ 2023-2024	

52. Description Preparation Date:	
28-3-2024	

53. Available Attendance Forms:	
Class/ on line	

54. Number of Credit Hours(Total)/Number of Units(Total)	
75/ 3	

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

Name: Dr. Sura Ramzi Shareef	**Email:** sura.ramzishareef@uomsul.edu.iq
Name: Sahar Khalid Ahmed	**Email:** sahar.ahmed@uomosul.edu.iq

56. Course Objectives

Course Objectives	• Understand the hardware and software and how they work together. • Explore the Windows operating system, change settings, and customize the desktop. • Students also learn how to manage files and folders. • Introduce the students to Microsoft Office word application. • Introduce the students to Microsoft Office Excel application.

57. 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.

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	3	Understand the	Computers and	Lecture&Lab	Quize

36

		fundamental concepts of computer hardware and software.	Operating System		
Week2	3	Understand the fundamental concepts of computer hardware and software.	Computers and Operating System	Lecture&Lab	Oral exam
Week 3	3	Explain the interaction between software and hardware in a computer system. Identify the key elements of an operating system and their roles.	Software and Hardware Interaction	Lecture&Lab	Quiz
Week 4	3	Explain the interaction between software and hardware in a computer system. Identify the key elements of an operating system and their roles.	Software and Hardware Interaction	Lecture&Lab	Assignme
Week 5	3	Utilize Windows operating system functionalities for effective file management and customization.	Windows File Management	Lecture&Lab	Quiz
Week6	3	Customize the Windows desktop and settings to meet personal preferences.	Operating System Customization	Lecture&Lab	quiz
Week 7	3	Demonstrate knowledge of computer components and their functions.	Computer Hardwa	Lecture&Lab	quiz

	3	Demonstrate knowledge of computer components and their functions.	Computer Hardware	Lecture&Lab	Oral exam
Week8					
Week 9	3		Monthly Exam	Lecture&Lab	exam
Week1	3	Start and close Microsoft Office 2013 applications. Switch between application windows. Navigate and identify the common elements in application windows.	Exploring Microsoft Office	Lecture&Lab	Quiz
Week 1	3	Apply Microsoft Word essentials for document creation, editing, and formatting. Create and format documents using Microsoft Word.	Getting Started with Word Essentials	Lecture&Lab	Assignem
Week 1	3	Edit and revise documents, including text formatting, paragraph alignment, and page layout. Utilize document templates and styles to enhance visual presentation	Editing and Formatting Documents	Lecture&Lab	quiz
Week 1	3	Utilize Microsoft Excel essentials for data organization,	Getting Started with Excel Essentials	Lecture&Lab	Oral exam
Week 1	3	Create and manage worksheets using Microsoft Excel. Organize and format data	Organizing and Enhancing Worksheets	Lecture&Lab	Quiz

Week						
				effectively		
Week 1	3	Apply formulas and functions to perform calculations and manipulate data. Create charts and graphs to visually represent data trends and patterns.	Creating Formulas and Charting Data	Lecture & Lab		Oral exam

59. Course Evaluation

			Time/Number	Weight (Marks)	
		Quizzes	2	10% (5)	
		Assignments	2	6% (3)	
		Lab.	10	20% (20)	
		Report	1	4% (4)	
		Midterm Exam	2 hr	10% (10)	

60. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	2015 Computer Literacy BASICS: A Comprehensive Guide to IC3 Connie Morrison, Dolores Wells, Lisa Ruffolo Cengage Learning. ISBN: 128576658X
Recommended books and references (scientific journals, reports)	IC3 GS5 Certification Guide Using Windows 10 & Office 2016.
Electronic references, websites	

Course Description Form

Course Name:
Programing using C++ Language

Course Code:
CO108

Semester/Year:
Two/ 2023-2024

Description Preparation Date:
1-43-2024

Available Attendance Forms:
Class/ on line

Number of Credit Hours(Total)/Number of Units(Total)
175/ 7

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

Name: Sahar Khalid Ahmed   **Email:** sahar.ahmed@uomosul.edu.iq

Name: Dr. Sura Ramzi Shareef   **Email:**   sura.ramzishareef@uomsul.edu.iq

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 and its application. • Understand and utilize structures in C++ programming

61.   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 activities that are interesting to the students.

62. Course Structure

Week	Hours	Required	Unit	or	Learning Method	Evaluation

		Learning Outcomes	Subject Name		Method
Week 1	6	An ability to acquire and apply new knowledge and using appropriate learning strategies	Introduction	Lecture	Oral exam
Week2	6	An ability to identify, analyze, and solve engineering problems	Algorithms and Flowcharts	lecture	quiz
Week 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&lab	quiz
Week 4	6	Develop competence in constructing arithmetic, relational and logical expressions in C++.	Arithmetic and logical expression: Arithmetic operators, logical operators, relational perators.	Lecture&Lab	quiz
Week 5	6	Implement control flow structures in C++ programs.	Selection statements: if, if–else, switch..case	Lecture &Lab	quiz

		Design and implement selection statements (if, if–else, switch/–case) for decision making.	and ? operator.		
Week6	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	Assignme
Week 7	6	Utilize loop statements (for, while, do–while) for repetitive tasks and iteration	Loop statements: for, while, do…while	Lecture &Lab	quiz
Week8	6	Utilize loop statements (for, while, do–while) for repetitive tasks and iteration	Loop statements: for, while, do…while	Lecture &Lab	Oral exar
Week 9	6	Apply functions, Design and implement user-defined functions to modularize code and improve code reusability.	functions	Lecture &Lab	Assignme
Week10	6	Apply functions, Design and implement user-defined functions to modularize code and improve code reusability.	functions	Lecture &Lab	quiz

Week 11	6	arrays, and vectors in C++ programming. Utilize arrays and vectors for efficient data storage and manipulation	Arrays and Vectors	Lecture &Lab	Oral exam
Week 12	6	arrays, and vectors in C++ programming. Utilize arrays and vectors for efficient data storage and manipulation	Arrays and Vectors	Lecture &Lab	quiz
Week 13	2		Mid-term Exam		exam
Week 14	6	Understand and utilize structures in C++ programming	Structures and Structure type functions	Lecture &Lab	quiz
Week 15	6	Understand and utilize structures in C++ programming	Structures and Structure type functions	Lecture &Lab	Oral exam

63. Course Evaluation

			Time/Number	Weight (Marks)	
		Quizzes	4	16% (16)	
		Assignments	2	4% (4)	
		Lab.	1	15% (15)	
		Report	1	5% (5)	
		Midterm Exam	1	10% (10)	

64. 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

65.Course Name:
Arabic Languge

66.Course Code:
CO109

67.Semester/Year:
The first/first stage

68.Description Preparation Date:
27/3/2024

69.Available Attendance Forms:
Face to face

70.Number of Credit Hours(Total)/Number of Units(Total)
60 hours and 3 units

71.Course administrator's name (mention all, if more than one name)
Name: **Reem Mohammed Tayeb AlHaffouthi**   Email: reem.m.t@uomosul.edu.iq

72.Course Objectives	
Course Objectives	a. Focus on providing students with a comprehensive understanding of the Arabic language and its grammar, including language, literature, skills, and punctuation, to achieve students' cognitive development and skills necessary to learn the Arabic language. b. Encouraging students to participate in daily preparations for explaining the material and engaging in effective dialogue

73.Teaching and Learning Strategies	
Strategy	Lecture accompanied by explanation and analysis. Discussion panel. Reports and research. Presentation of the material via PowerPoint slides. Questions and answers. Class participation.

74.Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4		**Speech and its parts**	Clarifying basic	Theoretical

				concepts	test with written and oral quizzes
2	4		**punctuation marks**	Clarifying basic concepts	Theoretical test with written and oral quizzes
3	4		**The subject and the predicate**	Clarifying basic concepts	Theoretical test with written and oral quizzes
4	4		**Anne and her sisters**	Clarifying basic concepts	Theoretical test with written and oral quizzes
5	4		**was and her sisters**	Clarifying basic concepts	Theoretical test with written and oral quizzes
6	4		**Rules for writing numbers**	Clarifying basic concepts	Theoretical test with written and oral quizzes
7	4		**Surah Al-Fajr**	Clarifying basic concepts	Theoretical test with written and oral quizzes
8	4		**Its importance and explanation, in addition to rhetorical images Syntactic and semantic**	Clarifying basic concepts	Theoretical test with written and oral quizzes
9	4		**The medium hamza and the extreme hamza**	Clarifying basic concepts	Theoretical test with written and oral quizzes
10	4		**The difference between dha and dha**	Clarifying basic concepts	Theoretical test with written and oral quizzes
11	4		**Literature Nazik Al-Malaika with her collections**	Clarifying basic concepts	Theoretical test with written and oral quizzes
12	4		**The prose styles of Al-Jahiz and Abu Hayyan Al-Tawhidi**	Clarifying basic concepts	Theoretical test with written and oral quizzes
13	4		**The difference between the open ta' and the 'marbuta ta**	Clarifying basic concepts	Theoretical test with written and oral quizzes
14	4		**Say and don't say**	Clarifying basic concepts	Theoretical test with written and

				oral quizzes
15	4			

75.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 10%** **Assignments 10%** **Report 10%** **Projects 10%** **Pre-final test 10%** **Final theoretical and practical test 50%**

76.Learning and Teaching Resources	
Required textbooks(curricular books, if any)	1. شرح ابن عقيل على الفية ابن مالك ، المرشد في الاملاء ، محمد شاكر سعيد 2. الاسلوب ، احمد الشايب ، طرق تعليم التعبير ، محمد عبد القادر أحمد
Main references (sources)	
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name:
Mathematics 2

2. Course Code:
CO110

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. Samar Ammar Yasir Email: samarammar@uomosul.edu.iq Name: Dr. Hussein Mahmood Mohammed Email: hussein.mahmood@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
Week 1	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	Oral exam
Week 2	5	Demonstrate an understanding of the fundamental theorems of integral mathematics and their applications in various mathematical disciplines, such as areas and volumes	Area between curves and volumes of solids of revolution using disk method. [ch5]+[ch6]	Lecture & Tutorial	Home work
Week 3	5	Apply the fundamental of integration to solve mathematical problems and calculate volumes using several methods.	Volumes of solids of revolution using washer method and cylindrical shells method [ch6] +quiz	Lecture & Tutorial	Quiz Home work
Week 4	5	Apply basic concepts of integration to calculate surface areas, and lengths of curves.	Length of curves in the plane and Areas of surfaces of revolution [ch6]	Lecture & Tutorial	Oral exam
Week 5	5	Understand and analyze the properties of inverse functions.	Inverse functions [ch1] Logarithm defined as an integral [ch7] +quiz	Lecture & Tutorial	Quiz Home work

Week					
Week 6	5	Understand and analyze the properties of transcendental functions, including the derivatives and integrals of natural exponential and logarithmic.	The natural logarithmic function. The Integrals of $\tan(x)$, $\cot(x)$, $\sec(x)$ and $\csc(x)$. Logarithmic Differentiation.[ch7]	Lecture & Tutorial	Oral exam Home work
Week 7	5	Understand and analyze the properties of transcendental functions, including the derivatives and integrals of general exponential e^x, a^x and $\log_a(x)$.	The derivative and integral natural exponential function. The general expoential a^x and logarithmic $\log_a(x)$ functions and and their derivative and integral.[ch1]+[ch7] +quiz	Lecture & Tutorial	Quiz Home work
Week 8	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	Oral exam Home work
Week 9	5		Mid exam		Exam
Week 10	5	Utilize techniques of integration by using basic integration formulas.	Techniques of integration using basic integration formulas. [ch8]	Lecture & Tutorial	Oral exam Home work
Week 11	5	Utilize techniques of integration, such as integration by parts.	Integration by parts. Tabular integration. [ch8]	Lecture & Tutorial	Oral exam

Week 12	5	Apply and use techniques of trigonometric integrals.	Trigonometric integrals.[ch8]	Lecture & Tutorial	Oral exam
Week 13	5	Use trigonometric substitutions to simplify and solve complex mathematical integration.	Trigonometric substitutions.[ch8] +quiz	Lecture & Tutorial	Quiz Home work
Week 14	5	Utilize partial fractions in rational functions to simplify and solve complex mathematical integration.	Integration of rational functions by partial fractions. [ch8]	Lecture & Tutorial	
Week 15	5		**Final exam**		Exam

11. Course Evaluation:					

		Quizzes	4	20% (20)	
		Assignments	8	16% (10)	
		Report	1	4% (4)	
		Midterm Exam	2 hr	10% (10)	

Required Textbooks: Calculus by Thomas and Finny.
Main reference : Lectures and notes
Recommended Textbooks: Thomas' Calculus: Early Transcendentals 13th Edition by George B. Thomas.
Electronic Reference/ Website:

Course Description Form

77.	Course Name:
Electrical Circuits Analysis 2	

78.	Course Code:
CO111	

79.	Semester/Year:
Second semester / First year	

80.	Description Preparation Date:
31/3/2024	

81.	Available Attendance Forms:
In class / on meet	

82.	Number of Credit Hours(Total)/Number of Units(Total)
175/7	

83.	Course administrator's name (mention all, if more than one name)
Name: Dr Ahmed Mamoon Fadhil Email: ahmedalkababji72@uomosul.edu.iq	

84.	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 circu

85.	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 and expand their critical thinking skills. This will be achieved through classes, interactive tutor and by considering type of simple experiments involving some sampling activities are interesting to the students

86. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	7	Demonstrate a thorough understanding of circuit analysis theorems underlying Direct Current (DC) and Alternating Current (AC) electrical circuits.	Circuit theory: source transformation [ch3,5,8,9]	Lecture	Oral exam
Week 2	7	Apply circuit analysis theorems (superposition, source transformation, mesh analysis, Nodal analysis)	Circuit theory: superposition [ch3,5,8,9] +quiz	Lecture &Lab	Quiz
Week 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
Week 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

Week 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
Week 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
Week 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
Week 8	7		Mid exam		Exam
Week 9	7	Analyse transient responses of RL, RC and RLC for various circuit configurations	Steady–State power Analysis [ch10] +quiz	Lecture	Quiz Oral exam Home work
Week 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
Week 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

54

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

87.

Quizzes 16%, Onsite Assignments 10%, Projects/Lab 10%, Reports 4%, Midterm Exam 10%, Final Exam 50%.

88. 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:
CE112

3. Semester/Year:
2nd semester/1st year

4. Description Preparation Date:
26/3/2024

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. 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	Unit or Subject Name	Learning Method	Evaluation Method

		Outcomes			
Week 1	5	Understanding digital logic circu	Introduction - Digital Logic Fundamentals	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 2	5	Understanding lc gates, truth tables	The Operation of Basic Lc Gates, Truth Table, Lc Function, and Lc Waveform	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 3	5	Understanding Boolean alge laws	Boolean Algebra Laws, S of Product (SOP) and Prod of Sum (POS) Lc Expressions	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 4	5	Apply properties Boolean alge theorems	Proof Theorems by Apply Properties of Boolean Alge Laws and Truth Tables	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 5	5	Understand fundamentals number representation	Number Syst Representation in Dig Computers	Lecture, Tutoria	Quiz,Assignment, Exam
Week 6	5	Understand fundamentals number representation	Conversions of Num Systems in Digital Comput	Lecture, Tutoria	Quiz,Assignment, Exam
Week 7	5	Utilize Karna maps as a graph minimizing tool	Minimization by Karna Maps	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 8	5	Utilize Karna maps as a graph minimizing tool	Five, Six Variable Karna Map and Multiple Funct Minimization	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 9	5	Demonstrate proficiency design and fabric digital logic circu	Mid-term Exam Implementing Boolean Lc Functions using Multiple based logic	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 10	5	Design and anal combinational magnitude comparators	Digital Magnit Comparator Circuits	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 11	5	Design and anal combinational decoder-encoder	Digital Binary Decoder Encoder Circuits	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 12	5	Design and anal combinational ad circuits	Binary Adder and Subtra Circuit, Half-Adder, F Adder, and Ripple Ca Adder	Lecture, I Tutorial	Quiz,Assignment, Exam
Week 13	5	Utilize Karna maps as a graph minimizing tool	Variable-entered Karna Map and Multiplexer T Implementation	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 14	5	Understand fundamentals number representation	Unsigned and Sig Numbers representation Digital Computers	Lecture, Tutoria	Quiz,Assignment, Exam
Week 15	5	All	**Preparatory week before final Exam**	Lecture, Lab, Tutorial	Quiz,Assignment, Exam

11. Course Evaluation
Quizzes 16%, Assignments 8%, Projects/Lab 6%, Reports 10%, Midterm Exam

57

10%, Final Exam 50%.	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Modern digital design by Richard S. Sandige; (McGraw–H Digital Fundamentals, 9th Edition, Thomas L; Floyd, Pear Prentice Hall, 2006.
Main references (sources)	
Recommended books and references (scientific journals, reports)	Introduction to Logic Design, 3rd edition, Alan Marcovitz, McGraw–Hill, 2010; Digital Design, 5th edition, Morris Mano, Pearson Prentice Hall, 2013.
Electronic references, websites	

Course Description Form

89.	Course Name:
Engineering Mathematics 1	

90.	Course Code:
CO201	

91.	Semester/Year:
Third semester / second year	

92.	Description Preparation Date:
7/4/2024	

93.	Available Attendance Forms:
In class / on meet	

94.	Number of Credit Hours(Total)/Number of Units(Total)
125 hr./ 5 unit	

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

Name: Sura Nawfal   Email: sura.nawfal@uomosul.edu.iq

Name: Warqaa Younis Email: warqaa.younis@uomousl.edu.iq

96.	Course Objectives

Course Objectives	• This course gives the students some more advanced subjects in engineering mathematics as partial derivative, differential equations, se and Fourier series and Multiple Integrals; this is to prepare the student f the next course and the other subjects like the numerical and engineeri analysis. • To develop mathematical skills so that students are able to apply mathematical methods & principles in solving problems from Engineering fields. • To make aware students of the importance and symbiosis between Mathematics and Engineering

97.	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.

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	5	Ability to solve multivariable functio with knowledge of th properties	Limits continuity (multivariable functions)	Lecture	Quiz,Assignment, Exam
Week 2	5	Ability to solve Par derivatives with knowledge of th propertie	Partial derivatives (definitions, functions more than variables)	Lecture	Quiz,Assignment, Exam
Week 3	5	Ability to solve Cl rule for functions by u two or three variables an Solve maxima minima and saddle point	Chain rule functions of or th variables Maxima minima saddle point	Lecture	Quiz,Assignment, Exam
Week 4	5	Ability to solve Doub integral Cartesian integrals form with knowledge of their properties	Double integral properties, Cartesian integrals form	Lecture	Quiz,Assignment, Exam
Week 5	5	Ability to solve Dou integral by Chang Cartesian integrals i polar form	Double integral (P form, Chang Cartesian integrals polar form)	Lecture	Quiz,Assignment, Exam
Week 6	5	Ability to solve Tr integrals in Carte coordinates with knowledge of th properties	Triple integ (Properties, Triple integ in Carte coordinates)	Lecture	Quiz,Assignment, Exam
Week 7	5	Ability to solve Triple integrals cylindrical coordi with knowledge of th properties	Triple integ (Triple integ in cylindr coordinates)	Lecture	Quiz,Assignment, Exam

60

Week						
Week 8	5	Ability to solve triple integral with any coordinate r and Increasing the student's knowledge of triple integral applications and how they linked it with the life	Triple integral (Application)		Lecture	Quiz,Assignment, Exam
Week	5	Ability to solve Fourier series, Trigonometric f with knowledge of th properties	Fourier Series (Trigonometric form)		Lecture	Quiz,Assignment, Exam
Week	5	Ability to solve Fourier series with te knowledge of even and function, Half Wave Symmetry.	Fourier Series even and function , Half Wave Symmetry)		Lecture	Quiz,Assignment, Exam
Week 1	5	Ability to knowledge Line Spectrum (harmonic) Fourier Series and them	Line Spectrum (harmonic) Fourier Series		Lecture	Quiz,Assignment, Exam
Week 1	5	Ability to solve Complex Exponential form of Fourier Series with knowledge of the properties	Complex Exponential form of Fourier Series		Lecture	Quiz,Assignment, Exam
Week	5	Ability to understand Vectors: (definition, notation, with knowledge of their properties	Introduction to Vectors (definition, notation, properties)		Lecture	Quiz,Assignment, Exam
Week	5	Ability to solve Vector algebra by using addition, subtraction, multiplication	Introduction to Vectors: Vector algebra addition, subtraction, multiplication		Lecture	Quiz,Assignment, Exam
Week	5	Ability to solve Vector functions as lines, plane fields, Eigen vector Eigen values to Increase the student's knowledge of vectors and its application	Vector functions: line planes, field Eigen vector Eigen values		Lecture	Quiz,Assignment, Exam

99. 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

100. Learning and Teaching Resources

Required textbooks(curricular books, if any)	[1] G. B. Thomas, E. Transcendentals, M. D. Weir, J. Hass, an Heil, *Calculus*, 13th edition. 2014.
Main references (sources)	
Recommended books and references (scientific journals, reports)	[2] E. Kreyszig, *Advance Engineering Mathematics*, 10th edition. 2011
Electronic references, websites	

Course Description Form

Course Name: .1	
Analog Electronics	
Course Code: .2	
CE202	
Semester/Year: .3	
1/2025	
Description Preparation Date: .4	
27/3/2024	
Available Attendance Forms: .5	
Face to face	
Number of Credit Hours(Total)/Number of Units(Total) .6	
150 hours and 6 ECTS	
Course administrator's name (mention all, if more than one name) .7	
Name: Rabee M. Hagem	
Email: rabeehagem@uomosul.edu.iq	

Course Objectives .8

Course Objectives	● Analyze and design electronic applications.
	● Nonlinear integrated circuit development such as diode.
	● Design systems for rectifying and amplifying Waves.
	● Gain and frequency response response calculations.
	● Operational amplifier and feedback circuits.
	● In addition to have a lab and practical experiments.

Teaching and Learning Strategies .9

Strategy	Encourage the students to participate in different activities such as solving questions through critical and logical thinking. In addition to do practical experiments.

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Semiconductors and diodes	Semiconductor Materials and introduction to PN junction diode	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
2	5	Diodes applications	pn junction diodes circuits and diode applications	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
3	5	Introduction to BJT transistor	Bipolar junction transistors BJT and BJT configurations	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
4	5	Biasing circuit and dc transistor	DC response, Transistor biasing and Transistor	Explain the main concepts face to	Theoretical and practical

		circuits	biasing examples	face through an interactive presentation of the subject with doing practical experiment after completing the lecture	test with written and oral quizzes
5	5	Transistor with Ac circuits	AC response, Multistage Transistor	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
6	5	The transistor behavior with different frequency	Frequency Response	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
7	5	Mid-term exam	Mid-term exam	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
8	5	FET and MOSFET	Introduction to FET and MOSFET	Explain the main concepts face to	Theoretical and practical

		transistors		face through an interactive presentation of the subject with doing practical experiment after completing the lecture	test with written and oral quizzes
9	5	FET and MOSFET biasing	FET and MOSFET biasing	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
10	5	Ac circuits for FET and MOSFET transistors	AC circuits for FET and MOSFET	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
11	5	Introduction to Operational Amplifier	Introduction to Operational Amplifier	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
12	5	OP applications 1	OP applications 1	Explain the main concepts face to face through an	Theoretical and practical test with

				interactive presentation of the subject with doing practical experiment after completing the lecture	written and oral quizzes
13	5	OP applications 2	OP applications 2	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
14	5	Positive and Negative feedback circuits	Positive and Negative feedback circuits	Explain the main concepts face to face through an interactive presentation of the subject with doing practical experiment after completing the lecture	Theoretical and practical test with written and oral quizzes
15	5		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

Course Evaluation.11
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 10%

Reports and labs 10%

Practical teat 10%

Pre–final test 20%

	Final theoretical and practical test 50%
	Learning and Teaching Resources.12
Required textbooks(curricular books, if any)	
Main references (sources)	Electronic Devices, Thomas L. Floyd, 10th edition, 2018
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

Course Name: .1	
Microprocessor I	
Course Code: .2	
CE203	
Semester/Year: .3	
Second semester/Second year	
Description Preparation Date: .4	
31/3/2024	
Available Attendance Forms: .5	
In class / on meet	
Number of Credit Hours (Total)/Number of Units (Total) .6	
150/6	
Course administrator's name (mention all, if more than one name) .7	
Name: Dr. Mazin Hashim Aziz	
Email: mazin.haziz@uomosul.edu.iq	

Course Objectives .8

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.

Teaching and Learning Strategies .9

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.

Course Structure .10

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	An ability to acquire	Introduction to	Lecture	Exam

		and apply new knowledge about the microprocessor's history and advances.	Microprocessors.		
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 microprocessor instructions and the useful tools for applying them.	The 8086 Microprocessor Instruction set, Debug, and MASM software	Lecture & Lab	Assignment, 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	Lecture &	Exam.

		the string instructions.	instructions' group	Lab	
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	

Course Evaluation .11	
5–Quizzes	10%
4– Assignments	8%
10–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%

Learning and Teaching Resources .12

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/NTM5Mjg0MDE5NTY1

Course Description Form

	Course Name: .1
	English Language 2
	Course Code: .2
	CO204
	Semester/Year: .3
	First Semester / Second Grade
	Description Preparation Date: .4
	1-4-2024
	Available Attendance Forms: .5
	In class + Online
	Number of Credit Hours(Total)/Number of Units(Total) .6
	75/3
	Course administrator's name (mention all, if more than one name) .7
	Name: Basman Mahmood Hasan Alhafidh
	Email: bm.alhafidh@uomosul.edu.iq
	Course Objectives .8
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.

Teaching and Learning Strategies .9

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.

Course Structure .10

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Review And learn grammar for the class	UNIT 1 Home and Away!: 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 Home and Away: Speaking: Missing	In Class Lecture	Quiz

			words.		
3	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	**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 instructions for making reports and presentations	Presentation day, giving feedback and presentation notes.	In Class Lecture	Quiz
6	2	Review And learn grammar for the class	UNIT 2 Been there, got the T-shirt: 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 Been there, got the T-shirt: 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 Been there, got the T-shirt: Listening: Dreams come true. Vocabulary: Hot verbs, make and do.	In Class Lecture	homework
9	2	And learn grammar for the class	UNIT 3 News and Grammar: Narrative enses. Reading: Book at bedtime.	In Class Lecture	**daily oral**
10	2	Learn conversation	UNIT 3 News and	In Class Lecture	**daily oral**

			Views: Speaking: Giving and receiving news.		
11	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	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 for the test.	In Class Lecture + Online	Class 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

Course Evaluation .11	
Quizzes	10
Homework	10
Conversations	10
Report and Presentation	10
Pre–Final Test	10
Final Test	50
Total	100

Learning and Teaching Resources .12	
Required textbooks(curricular books, if any)	
Main references (sources)	ARS, J. & SOARS, L. 2014. New Headway: Upper-Intermediate Fourth Edition: Student's Book and iTutor Pack, OUP Oxford.
Recommended books and references (scientific journals, reports)	
electronic references, websites	tps://elt.oup.com/student/headway/upperintermediate/?

Course Description Form

101.	Course Name:
Object Oriented Programming	

102.	Course Code:
CO205	

103.	Semester/Year:
Three–semester / Second year	

104.	Description Preparation Date:
4/4/2024	

105.	Available Attendance Forms:
In class	

106.	Number of Credit Hours(Total)/Number of Units(Total)
125/5	

107.	Course administrator's name (mention all, if more than one name)
Name: Ass. Prof. Dr. Turkan Ahmed Khaleel Email: turkan@uomosul.edu.iq	

108.	Course Objectives
Course Objectives	• this module aims to provide an introduction to the fundamentals of object oriented programming using C++

109.	Teaching and Learning Strategies
Strategy	There are several teaching and learning activities including lecture laboratories, and group projects. The assessment requires students design OOP classes and hierarchies related to a specific problem, implement a solution in the C++ language .

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject names	Learning method	Evaluation method

Week 1	5	Design OOP classes to represent unseen general concepts.	Introduction and review.	Lecture	Oral exam
Week 2	5	Design OOP classes to represent unseen general concepts.	Objects.	Lecture &Lab	Quiz
Week 3	5	Devise OOP class hierarchies and structures that relate to these classes	Data Abstraction.	Lecture	Oral exam Homework
Week 4	5	Devise OOP class hierarchies and structures that relate to these classes	Information Hiding & Encapsulation.	Lecture &Lab	Quiz
Week 5	5	Devise OOP class hierarchies and structures that relate to these classes	Constructors, destructors, and object creation.	Lecture	Oral exam Home work
Week 6	5	Implement these classes in the C++ programming languages.	Class Methods.	Lecture &Lab	Quiz
Week 7	5	Implement these classes in the C++ programming languages.	Methods Overloading	Lecture	Quiz
Week 8	5	Implement these classes in the C++ programming languages.	Inheritance		Exam
Week 9	5	Implement these classes in the C++ programming languages.	Polymorphism.	Lecture	Quiz Oral exam Homework
Week 10	5	Implement these classes in the C++ programming languages.	Abstract Classes	Lecture &Lab	Quiz Oral exam Home work
Week 11	5	Implement these classes in the C++ programming languages.	Abstract Methods	Lecture	Oral exam Home work

Week					
Week 12	5	Implement these classes in the C++ programming languages.	Exception Handling	Lecture &Lab	Quiz
Week 13	5	Communicate an OOP solution that solves real-world design.	Presentation on coursework if it is necessary	Lecture	Presentation
Week 14	5	Implement these classes in the C++ programming languages.	Students support	Lecture &Lab	Exam
Week 15	5		**Final exam**		Exam

		11. Course Evaluation:			
		Quizzes	2	5% (2.5)	
		Assignments	2	15% (7.5)	
		Lab	10	15% (7.5)	
		Project	1	5% (2.5)	
		Midterm Exam	2 hr	10% (30)	
		Final Exam	3hr	50% (50)	

Required Textbooks: Object-Oriented Programming in C++, Fourth Edition, by , Robert Lafore (Author), Waite Group,Sams Publishing,2002

Main reference : Lectures and notes

Recommended Textbooks: C++ programming an object oriented approach,
by Admin , 2022 .

Electronic Reference/ Website:

Course Description Form

Course Name: .1	
	Programmable Logic Design
Course Code: .2	
	CE206
Semester/Year: .3	
	3rd semester/2nd year
Description Preparation Date: .4	
	26/3/2024
Available Attendance Forms: .5	
	In class / On Meet
Number of Credit Hours(Total)/Number of Units(Total) .6	
	125/5
Course administrator's name (mention all, if more than one name) .7	
	Name: Dr. Shawkat Sabah Khairullah
	Email: Shawkat.sabah@uomosul.edu.iq
Course Objectives .8	
Course Objectives	The basic objective of this course is to instruct the students the basic principles of modern digital systems and programmable logic design. Topics covered include design and analysis of clocked sequential digital circuits such as flip-flops, shift registers, counters, and pattern detectors; the architectural concepts of different programmable logic devices (PLDs); Hazards in combinational logic circuits and eliminating techniques; field programmable gate array (FPGA) design techniques using very high-speed circuit hardware description language (VHDL) and introduction to modeling, simulation, synthesis (with Xilinx, Altera, or Intel FPGAs). This course will present the syntax, structure, and data types used in HDLs and gain proficiency in writing basic HDL code.
Teaching and Learning Strategies .9	
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.

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	5	design clocked sequential and interactive digital circuits	Sequential Logic Design: Synchronous and nchronous Circuit Models, Latch and Flip–Flop	ture, Lab, Tutorial, Lab	Quiz, Assignment, Exam
Week 2	5	gn clocked iential and ractive digital circuits	nchronous Sequential Logic Circuits: D Flip–Flop, J–K Flip–Flop, and T Flip–Flop	ture, Lab, Tutorial, Lab	Quiz, Assignment, Exam
Week 3	5	gn clocked iential and ractive digital circuits	chronous Register Design: serial–in/serial–out, serial–in/parallel–out, parallel–in/serial–out, parallel–in/parallel–out, and Non–Binary Counters based on Shift Registers	ture, Lab, Tutorial, Lab	Quiz, Assignment, Exam
Week 4	5	yze clocked iential and ractive digital circuits	alysis Tools: State Diagram (SD), Algorithmic State Machine (ASM) Chart, Transition Map, Race Condition, and Timing Diagram	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 5	5	del basic combinational–quential logic circuits	Clocked Synchronous Sequential Logic Circuits: Mealy and Moore State Machine Models	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 6	5	del basic –sequential counter circuits	Asynchronous and nchronous Counter Design	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 7	5	del basic binational logic circuits using VHDL	Introduction to VHDL: Language-based Design, VHDL Description and Simulation	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 8	5	ulating and verifying HDL designs	DL Code Structure: Entity d Architecture Declaration, Structural VHDL Model Components	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 9	5	ulating and verifying HDL designs	id–term Exam + Sequential and Concurrent VHDL Statements	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 10	5	ulating and verifying L designs, explore	VHDL State machines, implementation, and	Lecture, Lab, Tutorial	Quiz, Assignment, Exam

Week					
Week 11	5	...elop a solid ...erstanding of the ...itectural and programmable technologies	process of hardware synthesis ...simulation results, VHDL Data types: predefined and user-defined, operators ...oduction to Programmable Logic Devices: Taxonomy, ...plementation Technology Trade-offs	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 12	5	...elop a solid ...erstanding of the ...itectural and programmable technologies	Implementing Logic Functions using PLDs, PROM, FPGA Structure Design	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 13	5	...elop a solid ...erstanding of the ...itectural and programmable technologies	Basic Principles of ...grammable Logic Devices: PAL, PLA, GAL/CPLD	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 14	5	...erstand the hazard in ...binational logic circuits	Hazards in Combinational ...ic Circuits and Eliminating Techniques	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 15	5		All ...reparatory week before the final Exam	Lecture, Lab, Tutorial	Quiz, Assignment, Exam

Course Evaluation .11
Quizzes 5%, Online Assignments 3%, Onsite Assignments 2%, Projects/Lab 20%, Reports 10%, Midterm Exam 10%, Final Exam 50%.

Learning and Teaching Resources .12	
...Required textbooks(curricular books, if any)	Modern digital design by Richard S. ...ndige (McGraw-Hill); Voinci A. pedroni, "Circuit ...sign with VHDL", MIT press, Cambridge, London 2004.
Main references (sources)	
...ecommended books and references (scientific journals, reports)	Introduction to Logic Design, 3rd edition, Alan Marcovitz, McGraw-Hill, 2010.
Electronic references, websites	

Course Description Form

Course Name: Computational Methods for Data Analysis .1	
Course Code: CO207 .2	
Semester/Year: Second semester / Second year .3	
Description Preparation Date: 31/3/2024 .4	
Available Attendance Forms: physical attendance in class .5	
Number of Credit Hours(Total)/Number of Units(Total) 75/3 .6	
Course administrator's name (mention all, if more than one name) .7	
Name: Akram Abdul Mawjood Dawood , Dr. amar Idrees daood **Email:** akram.dawood@uomosul.edu.iq , amar.daood@uomosul.edu.iq	

Course Objectives .8

Course Objectives	he course "Computational Methods for Data Analysis" is designed to ovide students in the Bachelor of Science in Computer Engineering program with a solid foundation in both numerical analysis and istics. This course combines key concepts and techniques from both disciplines to equip students with the necessary tools to analyze and interpret data in various engineering and computational contexts.

Teaching and Learning Strategies .9

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.

Course Structure .10

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week1	2hr	Understand and analyze dataset.	Introduction to Data Analysis	Lecture	l exam
Week2	2hr	Learn all basic mathematical of statistics and probability.	scriptive Statistics, Measures of central tendency (mean, median, mode), Measures of ispersion (variance, standard deviation, range)	Lecture	Home work
Week3	2hr	Compute statistics measurements to conclude the distribution of the collected data	Data visualization techniques (histograms, box plots, scatter plots)	Lecture	Oral exam
Week4	2hr	Perform conducting predication analysis which can be applied into data mining.	ability Theory, amentals of probability	Lecture	Quiz
Week5	2hr	Use the techniques and skills to design and analysis system using the engineering tools to provide better description of real–world data.	nditional probability, Bayes for Data ng and Machine Learning	Lecture	Quiz Oral exam Home work
Week6	2hr	Probability basics	Discrete and continuous probability distributions omial, normal, exponential)	Lecture	Quiz
Week7	2hr	Probability calculations	Probability density and cumulative distribution functions	Lecture	Home work

Week8	2hr	List theories and concepts used in Numerical Analysis.	Introduction to Numerical Methods for Data and error Analysis	Lecture	l exam
Week9	2hr	Classifying the numerical techniques to compute approximate solutions of linear and nonlinear equations and differential equations.	umerical Methods for linear Data Analysis	Lecture	Home work
Week10	2hr	compute solutions of nonlinear equations	Numerical Methods for linear Data Analysis	Lecture	Quiz
Week11	2hr	Apply numerical techniques for interpolation.	polation and extrapolation	Lecture	Quiz Oral exam Homework
Week12	2hr	Apply numerical techniques for integrations.	Numerical integration	Lecture	Home work
Week13	2hr	Apply numerical techniques for differentiation	Numerical differentiation	Lecture	Oral exam
Week14	2hr	Apply the methods, formula and algorithms taught to simple problems;	Regression	Lecture	Quiz
Week15	2hr				

Course Evaluation .11
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. will be according the following table:‒

Weight (Marks)	Time/Number		
15% (15)	2	Quizzes	
10% (10)	2	Online Assignments	Formative assessment
5% (5)	1	Onsite Assignments	
10% (10)	1	Report	
10% (10)	2 hr	Midterm Exam	Summative
50% (50)	2hr	Final Exam	assessment
100% (100 Marks)	Total assessment		

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	
Main references (sources)	Lectures and notes
Recommended books and references (scientific journals, reports)	1‒Numerical Analysis Using Matlab and Excel, Steven T. Karris, 2‒Applied Numerical Methods with MATLAB® for Engineers and Scientists, Steven C. Chapra, Fourth Edition, 2017. 3‒Leader, Jeffery J. Numerical analysis and scientific computation. CRC Press, 2022. 4‒ Introduction to Probability and Statistics for Engineers, Holický, Milan
Electronic references, websites	

Course Description Form

Course Name: .1	
Engineering Mathematics II	
Course Code: .2	
CO208	
Semester/Year: .3	
fourth semester / second year	
Description Preparation Date: .4	
4/4/2024	
Available Attendance Forms: .5	
In class / on meet	
Number of Credit Hours(Total)/Number of Units(Total) .6	
125 hr./ 5 unit	
Course administrator's name (mention all, if more than one name) .7	
Name:	
Email:	
Course Objectives .8	

Course Objectives	• This course gives the students the ability to solve and investigate differential equations using different methods, two types of differential equations will be covered (1st order and second order, linear and non-linear), in doing so, the students will gain an advantage for the next courses in that some signal processing and control system problems that will be easier to solve. Also, the Laplace transform can be analyzed and more information about this transform can be gained and investigated
	• To develop mathematical skills so that students are able to apply mathematical methods & principles in solving problems from Engineering fields.
	• make aware students of the importance and symbiosis between Mathematics and Engineering.

	Teaching and Learning Strategies .9
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 activities that are interesting to the students

				Course Structure .10

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	5	Ability to solve Laplace transform problems with knowledge of their properties	Introduction to Laplace transform properties and state application	cture, Tutorial,	Quiz,Assignment, Exam
Week 2	5	Ability to solve Laplace transform problems by using Laplace table	Laplace transform table	cture, Tutorial,	Quiz,Assignment, Exam
Week 3	5	Ability to solve Laplace transform 1st shift and 2nd shift problems with knowledge of their properties	Shifting theorem anslation in S-main) 2nd Shifting theorem anslation in ne) Convolution Theorem	cture, Tutorial,	Quiz,Assignment, Exam
Week 4	5	Ability to solve Laplace transform with unit step function problems	it step function, Initial and final value theorems.	cture, Tutorial,	Quiz,Assignment, Exam
Week 5	5	Ability to solve Inverse Laplace transform problems	InverseLaplace Transform.	cture, Tutorial,	Quiz,Assignment, Exam
Week 6	5	Ability to solve ordinary differential equation with any order and Increasing the student's knowledge of Laplace applications and how they linked it with the life	Solution of Differential uations byLaplace ansformation, and Applications of LT	cture, Tutorial,	Quiz,Assignment, Exam

Week					
Week 7	5	lve the linear and non–linear differential ations 1st order and 2nd order equations, and choose appropriate ocedures to solve them	finition and ssification of erential equation (ordinary and tial, order, ree, Linear and non–linear).	cture, Tutorial,	Quiz,Assignment, Exam
Week 8	5	Ability to Solve the 1st order and 2nd order equations, and choose propriate procedures to solve them	utions of erential equations heral and rticular solutions)	cture, Tutorial,	Quiz,Assignment, Exam
Week 9	5	lity to solve 1st ode by different methods.	order ordinary s (Linear, separable homogeneous)	cture, Tutorial,	Quiz,Assignment, Exam
Week 10	5	Ability to solve 1st e by different methods.	order ordinary s (Exact, not ct, and onhomogeneous)	cture, Tutorial,	Quiz,Assignment, Exam
Week 11	5	lity to Solve the IVP boundary value problem	d Term Exam Initial value blems, Boundary ies problems of 2nd ODEs.,	cture, Tutorial,	Quiz,Assignment, Exam
Week 12	5	bility to Solve 2nd ode Linear and nonlinear	order ordinary DEs(Linear 2nd order des th constant coefficients,	cture, Tutorial,	Quiz,Assignment, Exam
Week 13	5	Solve functions th undetermined coefficients	Undetermined Coefficients method,	cture, Tutorial,	Quiz,Assignment, Exam
Week 14	5	lity to solve 2nd ode by iation of parameters systems then discussion.	order DEs with iable of ameter method, iable coefficients and team works	cture, Tutorial,	Quiz,Assignment, Exam
Week 15		All	Final Exam		Exam
					Course Evaluation.11

Quizzes 15%, Online Assignments 12%, Onsite Assignments 7%, Reports(team works) 6%, Midterm Exam 10%, Final Exam 50%.	
Learning and Teaching Resources.12	
Required textbooks(curricular books, if any)	G. B. Thomas, E. Transcendentals, M. D. Weir, J. Hass, and C. Heil, "Calculus", 13th edition. 2014.
Main references (sources)	E. Kreyszig, Advance Engineering Mathematics, 10th edition. 2011.
Recommended books and references (scientific journals, reports)	Dennis G. Zill ,"Advanced Engineering Mathematics",6th edition 2017
Electronic references, websites	

Course Description Form

Course Name: .1	
	Engineering Management
Course Code: .2	
	CE209
Semester/Year: .3	
Description Preparation Date: .4	
	29/3/2024
Available Attendance Forms: .5	
	Face to face
Number of Credit Hours(Total)/Number of Units(Total) .6	
	2/2 units
Course administrator's name (mention all, if more than one name) .7	
	Name: Farah Nazar Ibraheem
	Email:farah_nazar80@uomosul.edu.iq
	Name :Shaymaa Nazar Hussain
	Email :
Course Objectives .8	
Course Objectives	• Providing knowledge and skills that combine concepts Engineering and management
	• Improving efficiency and effectiveness in engineering projects
	• Developing management skills
	• Enhancing interaction between engineering and administrative departments
	• Enhancing the ability to strategic planning
	• Achieving sustainability in engineering projects
Teaching and Learning Strategies .9	
Strategy	ivating lessons and making them interactive: This includes using interactive methods such as group discussions, Group activities and educational

games that encourage students to actively participate in the learning process.

Using active learning techniques: This includes using technology in learning, such as multimedia, educational software, and electronic platforms, to enhance student interaction and make the learning process more enjoyable and effective.

Encouraging cooperative learning and cultural exchange: This includes encouraging students to work together in small groups, sharing experiences and opinions, and promoting interaction between students from different cultures and backgrounds.

Providing effective feedback: This involves providing students with regular feedback, whether positive to encourage them to move forward , or directive to improve their performance, which helps them improve their understanding and performance

Course Structure .10

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	...derstanding of Definitions and Terms, ...owledge of ...ganizational Structures	...ninistration and organization ...initions and ...ns, organization and organizational structures, committees, ...espondences and technical reports)	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral
2	2	Understanding Decision-Making Processes: •Define decision-	Methods and stages of decision-making	Use presentations to simplify difficult concepts and Encourage	Theoretical exam With Daily exams

		making and its importance in engineering management systems. •Explain the stages involved in decision-making processes.		interaction By adding guiding questions,stim ulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Written and oral
3	2	Understanding Project Management Concepts: ● Define project management and its importance in engineering contexts. ● Explain the key principles, processes, and methodologies of project management	Engineering Project Management (Definitions, Project Phases)	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stim ulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral
4	2	Understanding of Project Time Planning Concepts: ● Define project time planning and its significance in project	Project Time Planning (Critical th Method CPM)	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stim ulating discussions and providing Opportunities	Theoretical exam With Daily exams Written and oral

		management. ● Explain the importance of scheduling and time management in achieving project objectives		to ask questions and communicate with the lecturer or colleagues	
5	2	Explain how Data visualization, including bar rts, contributes to effective decision-making in engineering nanagement contexts	– bar charts	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stim ulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral
6	2	Identify the role of ta visualization in facilitating decision-making processes in engineering management.	ittal charts	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stim ulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral

7	2	Understanding Precedence Charts: ● Define what precedence charts are and their significance in project management and engineering. ● Explain the purpose of precedence charts in visualizing task dependencies and sequencing in engineering projects.	Precedence charts	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral
8	2		Midterm Exam	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral
9	2	Understanding The types of project control,time	Types of project control (time, costs,	Use presentations to simplify difficult	Theoretical exam With Daily

		costs , and quality	quality)	concepts and Encourage interaction By adding guiding questions,stim ulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	exams Written and oral
00	2	Identify key factors and criteria involved in selecting a project site, such as location, accessibility, land availability, environmental impact, zoning regulations, and infrastructure availability. Explain the significance of considering site ction criteria in the planning phase of project to ensure its feasibility, tainability, and success	Methods for choosing a project site and managing the work site	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stim ulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral
11	2	• Describe different types of contracts used in engineering projects, such as fixed-price contracts, cost-reimbursable	Contracting, its types and project Assignment methods	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stim ulating discussions	Theoretical exam With Daily exams Written and oral

		contracts, time and materials contracts, and hybrid contracts.			and providing Opportunities to ask questions and communicate with the lecturer or colleagues
		● Understand the advantages, disadvantages, and suitability of each contract type for different project scenarios and risk profiles.			
12	2	● Define what a table of quantities and specifications is and its role in engineering projects. ● Explain the importance of accurate quantity takeoffs and specifications in project planning, estimating, and procurement processes.	Table of Quantities and Specifications	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral
13	2	● Define quality management and its	Quality management and quality control	Use presentations to simplify difficult	Theoretical exam With Daily

		significance in engineering projects and operations. Explain key quality management principles, such as customer focus, continuous improvement, and process approach.		concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	exams Written and oral
14	2	Define quality management and its significance in engineering projects and operations. Explain key quality management principles, such as customer focus, continuous improvement, and process approach	Maintenance Management	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing Opportunities to ask questions and communicate with the lecturer or colleagues	Theoretical exam With Daily exams Written and oral
15	2		Preparatory week before the final Exam	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing	

		Opportunities to ask questions and communicate with the lecturer or colleagues	

Course Evaluation .11

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	**10%**
	Assignments	**10%**
	Projects /seminar	**10%**
Report	**10%**	
Midterm Exam	**10%**	
	Final Exam	**50%**

Learning and Teaching Resources .12

Required textbooks(curricular books, if any)	
Main references (sources)	avior in organizations, by J.Greenberg and R.Baron,prentice Hall,2000, 687 pages
Recommended books and references (scientific journals, reports)	n introduction to Management Science, Anderson at al , south western, 2000, 848 pages
Electronic references, websites	

Course Description Form

	Course Name .1
	Digital Electronics
	Course Code .2
	CO210
	Semester/Year .3
	2nd semester / 2nd year
	Description Preparation Date .4
	28-3-2024
	Available Attendance Forms .5
	in class ,on meet
	Number of Credit Hours(Total)/Number of Units(Total) .6
	150 /6
	Course administrator's name (mention all, if more than one name) .7
	Name: modhar ahmed hammoudy hussain
	Email: modharhammoudy@uomosul.edu.iq
	Course Objectives .8
Course Objectives	The course "Digital Electronics" is designed to provide students in the Bachelor of Science in Computer Engineering program with a solid foundation in both digital and electronics. This course combines key concepts and techniques to equip students with the necessary tools to analyze and design the digital circuits and systems.
	Teaching and Learning Strategies .9
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises and experiments while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and labs by considering type of simple experiments involving some designing activities that are

				interesting to the students.

				Course Structure .10

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	4	Monitoring the figure of merit of the logic gates types	Introduction to digital electronics and the digital IC characteristics	lecture	oral exam
Week 2	4	Naming all the Families (Types) of digital electronics circuits and the different between them	Resistor diode logic RDL	lecture	Home work
Week 3	4	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	Lecture &lab	Quiz
Week 4	4	determine the power consumption, number of load circuits and the logic voltage levels for the logic gate	Diode transistor logic DTL	Lecture &lab	Lab report
Week 5	4	determine the power consumption, number of load circuits and the logic voltage levels for the logic gate	Transistor transistor logic TTL	Lecture &lab	Quiz,Lab report
Week 6	4	determine the power consumption, number of load circuits and the logic voltage levels for the logic gate	Emitter coupled logic ECL , I2L	Lecture &lab	Lab report
Week 7	4	Naming all the Families (Types) of digital electronics circuits	The Field effect transistror FET	Lecture &lab	Lab report
Week 8	4	determine the logic	MOSFET logic	Lecture &lab	Home work

		voltage levels for the logic gate	circuits design and analysis		
Week 9	4	Naming the different between the digital electronics circuits	NMOS and PMOS logic circuits	Lecture &lab	Quiz
Week 10	4	determine the logic voltage levels for the logic gate	Complementary Metal Oxide CMOS logic circuits	Lecture	Oral exam
Week 11	4		mid exam		Exam
Week 12	4	Select the suitable logic design after summarizing the different types of logic gates families	Sequential MOS logic circuits	Lecture &lab	Lab report
Week 13	4	Ability of deconstruct any digital logic circuit to evaluate the electrical and logical magnitudes	Regenerative logic circuits	Lecture	oral exam
Week 14	4	Designing a new digital logic circuit to perform a certain duty	Semiconductor memories	Lecture	oral exam
Week 15	4		Final exam		Exam

Course Evaluation 11.

3 quizzes	3%
2 homework	2%
5 Lab reports	5%
Lab Term Exam	10%
Theory Term Exam	30%
Lab Final Exam	10%
Theory Final Exam	40%
Total	100%

Learning and Teaching Resources 12.

Required textbooks(curricular books, if any)	gital Integrated Circuits Analysis and Design" by: John E. Ayers.2004
Main references (sources)	alysis and Design of Digital Integrated Circuits" by: David A. Hodges. 1988
Recommended books and references (scientific journals, reports)	

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.

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	

Course Evaluation 11.	
5–Quizzes	10%
4– Assignments	8%
10–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%
	Learning and Teaching Resources .12
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/NTM5Mjg0MDE5NTY1

110.	Course Name:
Data Structures	

111.	Course Code:
C0212	

112.	Semester/Year:
Fourth-semester / Second year	

113.	Description Preparation Date:
28/3/2024	

114.	Available Attendance Forms:
In class	

115.	Number of Credit Hours(Total)/Number of Units(Total)
150/5	

116.	Course administrator's name (mention all, if more than one name)
Name: Ass. Prof. Dr. Turkan Ahmed Khaleel Email: turkan@uomosul.edu.iq	

117.	Course Objectives
Course Objectives	• The module aims to introduce students to a w variety of data structures and algorithms. It provi students with a coherent knowledge of techniqu for implementing data structures and algorithms also discusses the complexity, advantages, a disadvantages of different data structures a algorithms. Finally, it introduces the main algorith for fundamental tasks such as sorting and searchir

118.	Teaching and Learning Strategies
Strategy	There are a number of teaching and learning activities including lectu laboratories, and group projects. The concepts and principles of complexity anal in algorithms, data structures, search algorithms, sort algorithms, and object-orien programming will be covered in lectures.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	5	Examine abstract data types, concrete data structures, and algorithms.	Introduction and review, information	Lecture	Oral exam

			hiding, Encapsulation, Design, and implementation of list ADTS using arrays and linked lists.		
Week 2	5	Examine abstract data types, concrete data structures, and algorithms.	Recursion in Programming and Problem–Solving Recursive valued functions: Factorial, Classical problems.	Lecture &Lab	Quiz
Week 3	5	Specify abstract data types and algorithms in a formal notation.	Stacks Stack ADT, implementation using arrays.	Lecture	Oral exam Home work
Week 4	5	Specify abstract data types and algorithms in a formal notation.	Stacks Stack ADT, linked lists, and list ADTS, Applications: Checking balanced braces, recognizing strings, depth–first searches on graphs.	Lecture &Lab	Quiz
Week 5	5	Specify abstract data types and algorithms in a formal notation.	Queues: Queue ADT, implementation using arrays.	Lecture	Oral exam Home work
Week 6	5	Specify abstract data types and algorithms in a formal notation.	Queues: Queue ADT, linked lists, and list ADTS, Applications: breadth–first searches, recognizing palindromes.	Lecture &Lab	Quiz

Week 7	5	Implement complex data structures and algorithms.	Trees: Introduction, Terminology, Traversals, Applications: Binary Trees, Tree	Lecture	Quiz
Week 8	5	Implement complex data structures and algorithms.	Trees: Applications: Binary Trees, Tree		Exam
Week 9	5	Implement complex data structures and algorithms.	Introduction to Graph Theory.	Lecture	Quiz Oral exam Homework
Week 10	5	Implement complex data structures and algorithms.	Hashing Techniques	Lecture &Lab	Quiz Oral exam Home work
Week 11	5	Implement complex data structures and algorithms.	Sorting techniques and Searching techniques	Lecture &Lab	Oral exam Home work
Week 12	5	Implement complex data structures and algorithms.	Complexity Analysis	Lecture &Lab	Quiz
Week 13	5	Assess the effectiveness of data structures and algorithms.	Presentation on coursework if it is necessary	Lecture	Presentation
Week 14	5	Assess the effectiveness of data structures and algorithms.	Students support	Lecture &Lab	Exam
Week 15	5		Study week and preparations for assignment submission and Exams		Exam

11. Course Evaluation:					
		Quizzes	2	5% (2.5)	

11

		Assignments	2	15% (7.5)	
		Lab	10	15% (7.5)	
		Project	1	5% (2.5)	
		Midterm Exam	2 hr	10% (30)	
		Final Exam	3hr	50% (50)	

Required Textbooks: Data Structures Using C++ (Second Edition) by D.S. Malik – 2012 by D.S. Malik.

Main reference : Lectures and notes

Recommended Textbooks: Data Structures and Algorithms in C++ 4th Edition by Mark A. Weiss 2014.

Electronic Reference/ Website:

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 encoura[ge] 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/I[P] 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, exp[lain] and and compare v[arious] 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 Protocols	Multiple Access Links and Protocols	Lecture & LAB	Oral exam Home work
15	3	Identify and describe the Error Detection and Correction	Error Detection and Correction	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 (scientific journals, reports)	—————
Electronic references, websites	—————

Course Description Form

1. Course Name:
Signal and system

2. Course Code:
CO302

3. Semester/Year:
Five / Third

4. Description Preparation Date:
31/ 3/ 2024

5. Available Attendance Forms:
In class/ Meet

6. Number of Credit Hours(Total)/Number of Units(Total)
45/ 3

7. Course administrator's name (mention all, if more than one name)
Name: zahra talal abed
Email: zahraatalal@uomosul.edu.iq

8. Course Objectives

Course Objectives	This course will cover many topics and concepts related to digital systems, analogue and digital devices, and their characteristics. Topics to be covered during the discussion will include analogue and digital signals, how analogue signals are generated, and the general characteristics of digital signals and systems. This material deals with the study of digital convolution methods, the study of the frequency effects of digital signals, and how to calculate them

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method

1	3	Determine the analogue and digital signals	Introduction	Lecture	Oral t
2	3	Determine the digital system	digital system	Lecture	Quiz
3 & 4	6	Determine the transformation between analogue and digital signals	the transformation between analogue and digital signals	Lecture	Oral test+H.W.
5 & 6	6	Determine the basic properties of digital signals	properties of digital signals	Lecture	H.W.
7 & 8	6	Determine the convolution methods	the convolution methods	Lecture	Exam1
9 & 10	6	Determine the de-convolution method	The de-convolution methods	Lecture	Quiz
11 & 12	6	Determine the frequency response	the frequency response	Lecture	Oral test+H.W.
13 & 14	6	Determine the basic theory of DFT	DFT	Lecture	Quiz
15	1	Exam	Exam	Exam	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

Quizzes	2	5% (5)
Online assignments	2	5 % (5)
Projects	1	10% (10)
Report	1	)5% (5
Midterm Exam	2 hr	25% (25)
Final Exam	3 hr	50% (50)

12. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	1- "1- Discrete-Time Signal Processing" Edition, ALAN V. OPPENHEIM and SCHAFER HEWLETT, Prentice-Hall Si Processing Series, 2(2- "Digital Signal Processing", 3rd, Mithra, McGraw Hill Publications, 2008

11

| Recommended books and references (scientific journals, reports) | 1- "Discrete-Time Signal Processing" 3rd Edit[...] ALAN V. OPPENHEIM and W. SCHAF[...] HEWLETT, Prentice-Hall Signal Processing Se[...] 2[...]

. 2- "Digital Signal Processing", 3rd, Mithra, McGraw Hill Publications, 2008 |
|---|---|
| Electronic references, websites | |

Course Description Form

119.	Course Name:
Computer Architecture I	
120.	Course Code:
CO303	
121.	Semester/Year:
Semester 5 / 2023–2024	
122.	Description Preparation Date:
27 / 3 / 2024	
123.	Available Attendance Forms:
1. Classroom 2. Google Classroom (55tl2mf)	
124.	Number of Credit Hours(Total)/Number of Units(Total)
125 Hour / 5 Units	
125.	Course administrator's name (mention all, if more than one name)
Name: Lecturer Dr. Dhafir Abdulfattah Email: dhafir.abdulfattah@uomosul.edu.iq Name: Lecturer Assistant Farah Natiq Email: farah.qassabbashi@uomosul.edu.iq	
126.	Course Objectives

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

127. Teaching and Learning Strategies

Strategy	It includes: • Lecture Presentations. • Interactive Discussions. • Activities. • Problem-Solving Exercises.

128. 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: Interpret the various components of a digital computer.	Digital logic circuits and digital components review	Lecture	Discussions
2	3		Data representation: Signed number representation	Lecture	Classwork
3	3		Data representation: Fixed and floating point representation	Lecture	Quiz
4	3		Registers, bus and memory transfer	Lecture	Homework
5	3		Arithmetic micro-operations	Lecture	Homework
6	3		Logic and shift micro-operations	Lecture	Discussions
7	3		Application of logic micro-operations	Lecture	Quiz
8	3	Understanding: Interpret the types of instructions of a basic computer.	Basic Computer hardware design: Instruction codes and registers	Lecture	Discussions
9	3		Basic Computer hardware design: Computer instructions	Lecture	Classwork
10	3		Basic Computer hardware design: Timing, control and instruction cycle	Lecture	Classwork
11	3		Basic Computer hardware design: Memory reference instructions	Lecture	Homework
12	3		Basic Computer hardware design: Register reference instructions	Lecture	Quiz

13	3		Basic Computer hardware design: Input-output and interrupt instructions	Lecture	Classwork
14	3	Analysis: Outline the basic components of elementary basic computer.	Basic Computer hardware design: Complete design	Lecture	Project
15	3		Programming of Basic Computer	Lecture	Discussions

129. Course Evaluation

4pts	2 quizzes
3pts	3 homework
3pts	1 project
30pts	2 Term Exam
60pts	Final Exam
100pts	Total

130. Learning and Teaching Resources

Required textbooks (curricular books, if any)	M. Morris Mano "Computer System Architecture", 3rd Edition, 1992.
Main references (sources)	M. Morris Mano "Computer System Architecture", 3rd Edition, 1992.
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

	Course Name:
Computer Interface	
13.	Course Code:
CO304	
14.	Semester/Year:
Five / Third	
15.	Description Preparation Date:
31/ 3/ 2024	
16.	Available Attendance Forms:
In class/ Meet	
17.	Number of Credit Hours(Total)/Number of Units(Total)
150/ 2	
18.	Course administrator's name (mention all, if more than one name)
Name: Dr. Ina'am Fathi Khudher Email: inam.fathi@uomosul.edu.iq	
19.	Course Objectives
Course Objectives	1. Learn both hardware and software aspect of I/O interfaces into microprocessor-based systems. 2. gain hands- on experience with, common microprocessor peripherals such as PPI, USART, Timers, ADC and DAC, DMA, PIC. 3. Understanding the main I/O chips in terms of (internal architecture, I/O programming and applications. 4. interfacing the external devices to the processor.
20.	Teaching and Learning Strategies
Strategy	The main strategy that will be adopted in delivering this module is to encourage stude participation in the exercises, while at the same time refining and expanding their crit thinking skills. This will be achieved through classes, interactive tutorials and considering type of simple experiments involving some sampling activities that interesting to the students.
21. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Exploring The 80386 Microprocessor	The 80386 Microprocessor	lecture	
2	2	Identifying PPI interfacing	I/O interfacing (Parallel input/output using 8255 PPI and its applications)	Lecture+Lab	
3	2	Identifying PPI interfacing modes	8255 PPI Mode 1 & 8255 PPI Mode 2	Lecture+Lab	Quiz
4	2	Describing 8254 timer / counter	8254 timer / counter and applications	Lecture+Lab	H.W.
5	2	Describing 8279 keyboard/display controller	8279 keyboard/display controller	Lecture+Lab	
6	2	8237 DMA chip and its applications	8237 DMA chip and its applications	Lecture+Lab	
7	2	Describing A/D converters	A/D converters	Lecture+Lab	
8	2	Describing D/A converters	D/A converters	Lecture+Lab	H.W.
9	2	defining RS-232 bus	RS-232 bus	Lecture+Lab	
10	2	Exploring Serial I/O vs USART 8251 and applications 8250,16650 UART chips.	Serial I/O vs USART 8251 and applications 8250,16650 UART chips.	Lecture+Lab	Quiz
11	2	Exploring Microprocessor interrupts (HW and SW).	Microprocessor interrupts (HW and SW).	Lecture+Lab	
12	2	Exploring Microprocessor interrupts (HW and SW).	Microprocessor interrupts (HW and 13SW) 8259 PIC chip , master/slave of 8259 and its programming. (part1)	Lecture+Lab	
13	2	Defining 8259 PIC chip	8259 PIC chip , master/slave of	Lecture+Lab	

			8259 (part2)		
14	2	Exam	Theoretical Midterm Exam	Exam	
15	2	Seminar	Presentation.	Seminar	

22. 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	2	5% (5)
Online assignments	2	5 % (5)
Projects / Lab.	1	10% (10)
Report	1	)5% (5
Midterm Exam	2 hr	25% (25)
Final Exam	3 hr	50% (50)

23. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	1- 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. 2- 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)	1- Data Sheets (8255, 8253,8254,DAC808-ADC809,8251,1650,8237,8259, 8279) by Intel. 2- Intel 80x86 and other chips hardware reference manuals, Intel.
Electronic references, websites	

Course Description Form

24.	Course Name: Operating System I
25.	Course Code: CO305
26.	Semester/Year: Five 2023-2024
27.	Description Preparation Date: 28-3-2024
28.	Available Attendance Forms: ✓ Providing lectures in the designated classroom, in addition to creating a special electronic classroom for the subject. ✓ Lectures are presented on paper, in addition to an electronic Power Point presentation presented to students. ✓ Giving and explaining lectures in detail to students. ✓ Asking students to submit periodic reports and homework assignments on the basic topics of the subject.
29.	Number of Credit Hours(Total)/Number of Units(Total)150/6
30.	Course administrator's name (mention all, if more than one name)
Name:Dr.Sura Ramzi Shareef Email:sura.ramzishareef@uomosul.edu.iq	
31.	Course Objectives
Course Objectives	• Exploring the importance of operati systems, their goals and functions. • Introduction to designing a implementing operating systems. • Covers the various techniques used

the operating system to mana
resources.

- Introducing the student to the conce
and structure of various operati
systems, how they work internally, a
their most important main parts.
- Teaching the student the concept of
program, methods of scheduling it on
central processing unit, and how
implement it using many differ
algorithms. How to manage
clustering of processes (process
threads, CPU scheduli
synchronization, and learning about
concept of deadlock). And ways to so
the problem of system stagnation and
to prevent or avoid it.

32.	Teaching and Learning Strategies

Strategy	The main strategy in this course is to: Encouraging students' participation in exercises, as well improving and expanding their critical thinking skills. Throu familiarity with the workings of the system, the purpose of its u and cases of complete system downtime and dealing with them they occur. This will be achieved through classrooms, interact educational programs, and by considering the type of sim experiments that include some sampling activities that are of inter to students.

33. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
exams, homewo reports+ Discuss	Lectures	Introduction Chapter 1	Introduction operating syste basic definitions the hardw components software used operating syste types of systems, t	8	2-1

exams, homework, reports+ Discussion	Lectures		origin development, types of mod systems..		
exams, homework, reports+ Discussion	Lectures	Operating-System Services Chapter 2	Learn about structure of operating syste how it works, and most important b components.	8	4-3
exams, homework, reports+ Discussion	Lectures	Processes Chapter 3	Learn about the concept of the program How to schedule i through the syster on the central processing unit Implementation ar types of programs alike Whether it is a system-specific program Belongs to the us	4	5
exams, homework, reports+ Discussion	Lectures	Threads & Concurrency Chapter 4	Basic princip and concepts process management operating syste including proc creation, scheduling, synchronization, communication,,	8	7-6
exams, homework, reports+ Discussion	Lectures	CPU Scheduling Chapter 5	Learn about concept of program methods scheduling it throu the system on central process unit and how implement it us many dive algorithms.	4	8
exams, homework, reports+ Discussion	Lectures	Synchronization Tools Chapter 6	Analyze examp of synchronizat problems operating syste such as produc consumer, read	8	10-9

exams, homewo reports+ Discussion	Lectures	Synchronization Examples Chapter 7	The problem of tl section is critical. sync devices, Signals, classic problems Of synchronicity.	8	12-11
exams, homewo reports+ Discussion	Lectures	Deadlocks Chapter 8	Identify the conc of stagnation ways to solve problem of syst stagnation and try prevent it or avoi occurrence	8	14-13
Exam		Final exam		3	15

34. 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)
Formative assessment	**Quizzes**	3	15% (5)
	Assignments	2	5% (2.5)
	Lab	15	15% (15)
	Report	1	5% (5)
Summative assessment	**Midterm Exam**	3 hr	10% (10)
	Final Exam	3 hr	50% (50)
Total assessment			100% (100 Marks)

35. Learning and Teaching Resources

Required textbooks(curricular books, if any)	1. Operating Systems Concepts, 1(Edition Silberschatz, Abraham, Gal\ Peter B., and Gagne, G JohnWiley&Sons.,Inc. ISE 9781119320913.

12

Main references (sources)	1. Operating Systems Concepts, 1(Edition Silberschatz, Abraham, Gal\ Peter B., and Gagne, G JohnWiley&Sons.,Inc. ISE 9781119320913. 2. An Introduction to GCC: For the GI Compilers GCC and G++, Brian Gough, Richard M. Stallman, Netw Theory Ltd, ISBN : 978−095416179
Recommended books and references (scientific journals, reports)	جميع المجلات العلمية الرصينة في موضوع نظم التشغيل وانواعها وتطورها.
Electronic references, websites	1. Lectures notes at www.tutorial.com 2. Other lectures notes on t Internet network

Course Description Form

131.	Course Name:
Basics of Artificial Intelligence	

132.	Course Code:
CO306	

133.	Semester / Year:
First semester / Third year	

134.	Description Preparation Date:
30/3/2024	

135.	Available Attendance Forms:
Attend	

136.	Number of Credit Hours (Total) / Number of Units (Total):
3/75	

137. 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

138.	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 understand real-world systems.

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

140. 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 artificial intelligence	Classification, regression, clustering, and association	Lecture	Oral exam
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	

141. 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

Weight (Marks)	Time/Number	
15% (15)	2	**Quizzes**
10% (10)	2	**Online Assignments**
5% (5)	1	**Onsite Assignments**
10% (10)	1	**Projects**
10% (10)	2 hr	**Midterm Exam**
50% (50)	3hr	**Final Exam**

	100% (100 Marks)		**Total assessment**

142. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Lecture notes
Main references (sources)	**Pattern Recognition and Machine Learni** 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 Learni** by Christopher M. Bishop

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 network	Wired LANs	Lecture & LAB	Quiz & Oral exam
3	3	Explain and compare with various types of Networks	Connecting LANs, Backbone Networks, and Virtual LANs	Lecture & LAB	Quiz
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 Protocol	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 (scientific journals, reports)	–––––
Electronic references, websites	–––––

Course Description Form

1. Course Name:
DSP

2. Course Code:
CO308

3. Semester/Year:
Five / Third

4. Description Preparation Date:
31/ 3/ 2024

5. Available Attendance Forms:
In class/ Meet

6. Number of Credit Hours(Total)/Number of Units(Total)
45/ 3

7. Course administrator's name (mention all, if more than one name)
Name: zahra talal abed
Email: zahraatalal@uomosul.edu.iq

8. Course Objectives

Course Objectives	This course will cover many topics and concepts relate to digital systems, analogue and digital devices, and th characteristics. Topics to be covered during the discussion will include analogue and digital signals, ho to generate digital signals and general characteristics digital signals and systems. This course deals with the study of conversion methods and how to design digital filters based on FIR and IIR properties.

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Introduction of Z transform to determine the basic	Introduction of Z transform	Lecture	Oral t

		theory			
2	3	Determine the properties of Z transform	properties of Z transform	Lecture	Quiz
3 & 4	6	Determine the method of Z transform	method of Z transform	Lecture	Oral test+H.W.
5 & 6	6	Determine the properties of inverse Z transform	inverse Z transform	Lecture	H.W.
7 & 8	6	Determine the method to find the transfer function	Transfer function	Lecture	Exam1
9 & 10	6	Introduction of digital filter	Introduction of digital filter	Lecture	Quiz
11 & 12	6	Determine the method of IIR filter design	IIR filter design	Lecture	Oral test+H.W.
13 & 14	6	Determine the method of FIR fil design	FIR filter design	Lecture	Quiz
15	1	exam	Exam	Exam	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

Quizzes	2	5% (5)
Online assignments	2	5 % (5)
Projects	1	10% (10)
Report	1	)5% (5
Midterm Exam	2 hr	25% (25)
Final Exam	3 hr	50% (50)

12. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	1– "1– Discrete–Time Signal Processing" Edition, ALAN V. OPPENHEIM and SCHAFER HEWLETT, Prentice–Hall Signal Processing Series, 2(2– "Digital Signal Processing", 3rd, Mithra, McGraw Hill Publications, 2008

Recommended books and references (scientific journals, reports)	1- "Discrete-Time Signal Processing" 3rd Editi ALAN V. OPPENHEIM and W. SCHAF HEWLETT, Prentice-Hall Signal Processing Ser 2 . 2- "Digital Signal Processing", 3rd, Mithra, McGraw Hill Publications, 2008
Electronic references, websites	

Course Description Form

143.	Course Name:
Computer Architecture II	
144.	**Course Code:**
CO309	
145.	**Semester/Year:**
Semester 6 / 2023-2024	
146.	**Description Preparation Date:**
27 / 3 / 2024	
147.	**Available Attendance Forms:**
3. Classroom 4. Google Classroom (jjx3p5i)	
148.	**Number of Credit Hours(Total)/Number of Units(Total)**
125 Hour / 5 Units	
149.	**Course administrator's name (mention all, if more than one name)**
Name: Lecturer Dr. Dhafir Abdulfattah Email: dhafir.abdulfattah@uomosul.edu.iq Name: Lecturer Assistant Farah Natiq Email: farah.qassabbashi@uomosul.edu.iq	
150.	**Course Objectives**
Course Objectives	• Provides the basic knowledge necessary to understan the principle of microprogrammed control unit. • Highlights the central processing unit and the RISC &

		CISC Characteristics.		
		• Gives the understanding of pipeline concepts and design.		

151.	Teaching and Learning Strategies			
Strategy	It includes: • Lecture Presentations. • Interactive Discussions. • Activities. • Problem-Solving Exercises.			

152. 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	Discussions
2	3		Microprogrammed Control: Mapping and sequencer	Lecture	Quiz
3	3		Microprogrammed Control: Micro-instructions	Lecture	Classwork
4	3		Microprogrammed Control: Micro-instructions programming	Lecture	Homework
5	3		Microprogrammed Control: Design of decoding ALU control information	Lecture	Homework
6	3		Microprogrammed Control: Design of microprogram sequencer	Lecture	Discussions
7	3		Microprogrammed Control: Condition and branching implementation	Lecture	Quiz
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	Discussions
9	3		Central Processing Unit: Stack organization	Lecture	Classwork
10	3		Central Processing Unit: Instruction format and addressing mode	Lecture	Classwork
11	3		Central Processing Unit: Flags (processor status word)	Lecture	Quiz

13

12	3		RISC & CISC characteristics	Lecture	Homework
13	3	Knowledge: Identify the principle of the pipelining. Analysis: analyze the basic components of the pipeline.	Pipelining concepts and design	Lecture	Classwork
14	3		Pipelining concepts and design	Lecture	Discussions
15	3		Pipelined processor	Lecture	Discussions

153. Course Evaluation

	4pts	2 quizzes
	4pts	2 homework
	32pts	2 Term Exam
	60pts	Final Exam
	100pts	Total

154. Learning and Teaching Resources

Required textbooks (curricular books, if any)	M. Morris Mano "Computer System Architecture", 3rd Edition, 1992.
Main references (sources)	M. Morris Mano "Computer System Architecture", 3rd Edition, 1992.
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

155.	Course Name:

Embedded Systems

156.	Course Code:

CE310

157.	Semester/Year:

Sixth / Third Year

158.	Description Preparation Date:

31/3/2024

159.	Available Attendance Forms:

In class / on meet

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

150/ 2

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

Name: Dr. Ina'am Fathi Khudher

Email: inam.fathi@uomosul.edu.iq

162.	Course Objectives

Course Objectives	1. Introduce the fundamentals of embedded system design and implementation, including specifications and modeling of embedded systems, hardware/software partition and exploring ATmega2560 Micro-controller Architecture. 2. co-design: validation and implementation, peripherals and interfacing :memory : development methodologies and tools. 3. learn about: low-level microcontroller programming, hardware aspects, I/O interfacing, timers and signal conversion

163.	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.

164. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Defining embedded systems and identify applications to real word systems.	Introduction to Micro-controller vs. Microprocessor	lecture	
2	2	Learn about the Arduino ATmega2560 architecture Learn about the set of special instructions for programming the Arduino	ATmega2560 Micro-controller Architecture	Lecture+ Lab.	H.W.
3	2	Describe the different I/O configurations available in General Purpose I/O (GPIO)	Arduino Mega 2560 General Purpose Input/ Output Pins description	Lecture+ Lab.	
4	2	Learn about the set of special instructions for programming the Arduino	Addressing modes, instruction set (part1)	Lecture+ Lab.	
5	2	Learn about the set of special instructions for programming the Arduino	Addressing modes, instruction set (part2)	Lecture+ Lab.	
6	2	Describe the basic features and operation of typical hardware timers used in embedded systems	ATmega2560 6-timer/Counter modes (part1)	Lecture+ Lab.	Quiz
7	2	Describe the basic features and operation of typical hardware timers used in embedded systems	ATmega2560 6-timer/Counter modes (part2)	Lecture+ Lab.	
8	2	Identify and define interrupts supported on the embedded system(s).	ATmega2560 Interrupts (part1)	Lecture+ Lab.	
9	2	Describe architectural methods for ADCs and write programs that use one or more external sensors	ATmega2560 Interrupts (part2)	Lecture+ Lab.	
10	2	Describe the basic features and operation of typical serial communications for devices used in embedded systems	ATmega2560 Serial Communication modes of operation (part1)	Lecture+ Lab.	Quiz

11	2	Describe the basic features and operation of typical serial communications for devices used in embedded systems	ATmega2560 Serial Communication modes of operation (part2)	Lecture+ Lab.	
12	2	Identify the power system in embedded systems	Micro-controller power management	Lecture	H.W.
13	2	Embedded systems applications	Micro-controller features and applications	Lecture	
14	2	Semester exam	Theoretical Midterm Exam	Exam	
15	2	Project presentation	Presentation	Seminar	

165. 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

5% (5)	2	**Quizzes**
5 % (5)	2	**Online assignments**
10% (10)	1	**Projects / Lab.**
5% (5)	1	**Report**
25% (25)	2 hr	**Midterm Exam**
50% (50)	3 hr	**Final Exam**

166. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	The ATmega640/1280/2560/V Microcontroller Data sheet
Recommended books and references (scientific journals, reports)	Embedded system Design: Embedded systems Foundations of Cyber-Physical Systems, Peter Marwedel, Spriner Nov. 16, 2010.
Electronic references, websites	

Course Description Form

167.	Course Name: Operating System II

168.	Course Code:CO311

169.	Semester/Year:Six 2023-2024

170.	Description Preparation Date:28-3-2024

171.	Available Attendance Forms: Theory and Lab

172.	Number of Credit Hours(Total)/Number of Units(Total) :150

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

Name:Dr.sura ramzi shareef

Email:sura.ramzishareef@uomosul.edu.iq

174.	Course Objectives

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

175.	Teaching and Learning Strategies

Strategy	1.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.
	2. 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.
	3. 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.
	4. Comprehend the file system interface, implementation, and internals, including file organization, directory structures, and access methods, for effective management and manipulation of files and directories in operating systems.
	5. Develop an understanding of virtual machines and distributed systems, including virtualizat techniques, distributed file systems, and network communication protocols, to enable deployment and management of scalable and reliable computing environments across mult machines and networks.
	This course introduces the concepts of the operating system.
	- It includes: different memory management techniques, such as main memory management and virtual memory, paging, segmentation, and demand paging, to optimize memory utilization including concepts like and support multitasking in operating systems and file systems and storage; virtualization and distributed systems. - It demonstrates the structure and functionality of mass storage systems, including disk organization, file systems, and I/O systems.

176. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	1.Understand the c principles and concepts process management operating systems, includ process creation, scheduli	Overview of Process Management	Theory	

2 3	4 4	synchronization, communication, to effective manage system resources facilitate efficient execution user programs. 2. Gain knowledge of differ memory management techniqu such as main mem management and virtual memo including concepts like pag segmentation, and dem paging, to optimize mem utilization and supp multitasking in operating syster	Main Memory Main Memory	Theory&lab	Quiz,Homwork
4 5	4 4		Virtual Memory Virtual Memory	Theory&lab	Quiz,Homwork
6	4	3. understanding of virtual machines	Mass-Storage Struactuer	Theory&lab	Homwork
7 8	4 4	4. 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.	I/O System I/O System	Theory&lab	Homwork
9	4			Theory&lab	Quiz,Homwork
10 11	4 4	5.Explore the structure and functionality of file systems, and I/O systems, to ensure efficient and reliable storage and retrieval of data in operating systems.	File-System Interface	heory&lab	Quiz,Homwork

12	4	6.. Comprehend the file system interface, implementation, and internals, including file organization, directory structures, and access methods, for effective management and manipulation of files and directories in operating systems.	File–System Implementation File–System Implementation	Theory	
13	4	7. Comprehend the file System interface, implementation, and intern... including file organization, directory structures, and acc... methods, for effective management and manipulat... of files and directories in operating systems.	File–System Internals	...heory&lab	Theory&lab
14	4	8.Comprehend the file system interface, implementation, and intern... including file organization, directory structures, and access methods, for effecti... management and manipulation of files and directories in operating systems. 9. Develop an understand... of virtual machines a... distributed systems, includ... virtualization techniqu... distributed file systems, a... network communicat...	Virtual Machines Distributed Systems	...heory&lab	Theory&lab

15	protocols, to enable deployment and managem of scalable and relia computing environme across multiple machines a networks. FINALEXAM			EXam

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

Module Evaluation					
تقييم المادة الدراسية					
Relevant Learning Outcome	**Week Due**	**Weight (Marks)**	**Time/Number**		
LO # 1,2,3,5	9, 13	15% (15)	3	**Quizzes**	**Formative assessment**
LO # 1, 2, 3	10, 12	5% (5)	2	**Assignments**	
All	Continuous	15% (15)	15	**Lab**	
LO #1–5	12	5% (5)	1	**Report**	
LO # 1–5	11	10% (10)	3 hr	**Midterm Exam**	**Summative assessment**
All	16	50% (50)	3 hr	**Final Exam**	
		100% (100 Marks)		**Total assessment**	

178. Learning and Teaching Resources

Required textbooks(curricular books, if any)	1. Operating Systems Concepts, 10th Edition Silberschatz, Abraham, Gal Peter B., and Gagne, Greg JohnWiley&Sons.,Inc. ISBN: 9781119320913

Main references (sources)	1. Operating Systems Concepts, 10th Edition Silberschatz, Abraham, Gal Peter B., and Gagne, Greg John Wiley&Sons.,Inc. ISBN: 9781119320913
Recommended books and references (scientific journals, reports)	2. An Introduction to GCC: For the GNU Compilers GCC and G++, Brian J. Gough, Richard M. Stallman, Network Theory Ltd, ISBN : 978–0954161798
Electronic references, websites	www.tutorial.com

Course Description Form

1. Course Name:
English Language intermediate level

2. Course Code:
N/A

3. Semester/Year:
First Semester / Third Grade

4. Description Preparation Date:
1-4-2024

5. Available Attendance Forms:
In class + Online

6. Number of Credit Hours(Total)/Number of Units(Total)
30/2

7. Course administrator's name (mention all, if more than one name)
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 diffe renc e: 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.	In Class Lecture	daily oral and homework

			Vocabulary: Compound words.		
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 instructions for making reports and presentations	Presentation day, giving feedback and presentation notes.	In Class Lecture	Quiz
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 for the test.	In Class Lecture + Online	Class 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	5
Homework	5
Conversations	10
Report and Presentation	10
Pre–Final Test	10
Final Test	60
Total	100

12. Learning and Teaching Resources

Required textbooks(curricular books, if any) Main references (sources)	SOARS, J. & SOARS, L. 2014. New Headway –Intermediate Fou Edition: Student's Book and iTutor Pack, OUP Oxford.
Recommended books and references (scientific journals reports)	
Electronic references, website	https://elt.oup.com/student/headway/intermediate/?cc=u &selLanguage=en

Course Description Form

179.	Course Name:
Professional Ethics	

180.	Course Code:
CO401	

181.	Semester/Year:
Seven / Fourth	

182.	Description Preparation Date:
28-03-2024	

183.	Available Attendance Forms:
On site	

184.	Number of Credit Hours(Total)/Number of Units(Total)
50/2	

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

Name: Joan Atheel Ahmed

Email: joan.akrawi@uomosul.edu.i

Name: Hasan Fakhry Hasan

Email: hasan.allayla@uomosul.edu.iq

186.	Course Objectives
Course Objectives	1. define and understand concepts of ethics and professional ethics.
	2. ● develop knowledge of and describe basic ethical theories and principles for ethical decision-making.
	3. ● identify and think through moral situations and issues encountered by a wide range of different professionals.
	4. ● apply ethical theories and principles to specific moral challenges and dilemmas faced by professionals.
	● develop and improve skills essential in analyzing and resolving

			ethical problems and conflicts in professional settings through the use and application of ethical theories.		

187.	Teaching and Learning Strategies				

Strategy	Type something like: 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.

188. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	2	Defines and understands concepts Morals and ethics Professional	Introduction Learning Outcomes	On class	Oral exam
Week 2	2	Defines and understands concepts Morals and ethics Professional	Meaning of Ethics Branches of Philosophical Ethics	On class	Quiz
Week 3	2	Defines and understands concepts Morals and ethics Professional	The Meaning and Nature of Professional Ethics Summary	On class	Oral exam Home work
Week 4	2	Defines what it is and what it is	Possible Answer Self-Assessment	On class	Quiz

			Exercise		
Week 5	2	Defines areas of Ethical Study.	Normative Ethical Theories: Consequentialism	On class	Oral exam Home work
Week 6	2	Identify ethical Issues computing business applications and/or Use cases,	Egoism Psychological Egoism Ethical Egoism	On class	Quiz
Week 7	2	Distinguish them from technical, legal, commercial business issues/challenges Related to public relations.	Utilitarianism Normative Ethical Theories – Deontology	On class	Quiz
Week 8	2		Mid exam	On class	Exam
Week 9	2	Identify ethical issues in computing business applications and/or Use cases	Kantian Deontology Russian Deontology	On class	Quiz Oral exam Home work
Week 10	2	Computer science contexts Identify owners	Normative Ethical Theories – Virtue Ethics	On class	Quiz Oral exam Home work

		Moral interest relevant in the scenario			
Week 11	2	Identify owners Moral interest relevant in the scenario	The Nature of Moral Virtue Aristotle's Virtue Ethics	On class	Oral exam Home work
Week 12	2		report	On class	Quiz
Week 13	2	Learn about some important r moral values And interests nd the risks And conflicts vulnerab	Ethical Principles the Medical Profession	On class	Oral exam Home work
Week 14	2	In a certain scenario One or more applications From general frameworks To make decisions Ethical in Context of science projects Computer	Preparatory week before the final exam	On class	Quiz
Week 15	2		Final exam	On class	Exam
189. 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

1– Monthly exam 25%–100%

2– 10%–100% report

3– Daily preparation 5%–100%

4– Final exam 60% – 100%

$190.$ Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The Ground of Professional Ethics By Daryl KoehnCopyright 1994
Main references (sources)	
Recommended books and references (scient journals, reports)	1st Edition **Ethical Issues in Journalism and the Media** Edited By Andrew Belsey, Ruth ChadwickCopyright 1992
Electronic references, websites	https://nou.edu.ng/coursewarecontent/PHL%20242.pdf

Course Description Form

191.	Course Name:
Fundamentals of Control Systems	

192.	Course Code:
CO402	

193.	Semester/Year:
Seven / Fourth	

194.	Description Preparation Date:
31/3/2024	

195.	Available Attendance Forms:
In class / on meet	

196.	Number of Credit Hours(Total)/Number of Units(Total)
200/8	

197.	Course administrator's name (mention all, if more than one name)
Name: Dr.Sura Nawfal abdulrazzaq Email: Sura.nawfal@uomosul.edu.iq Name: Ola Marwan Email: ola.marwan@uomosul.edu.iq	

198.	Course Objectives
Course Objectives	• Understanding Control System Principles: Students will develop a solid understanding of the principles and fundamentals of control systems. • Analyzing and Designing State Variable Models: Students will learn to analyze and design control systems using state variable models. • Evaluating System Performance: Students will gain the ability to evaluate the performance of control systems, particularly focusing on the time response and dynamic performance of second-order systems. • Analyzing Frequency Response: Students will learn to analyze control

			systems in the frequency domain.		
			• Designing PID Controllers and Digital Control Systems: Students will acquire the knowledge and skills to design proportional-integral-derivative (PID) controllers and understand their application in control systems. They will also explore the stability analysis of digital control systems in the Z-plane and learn techniques like Jury's test.		

199.	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.

200. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	3	Understand the differential equations of physical systems open & closed loop systems.	Introduction : Control system [ch1]	Lecture	Oral exam
Week 2	3	An ability to solve the transfer function of linear systems block diagram models.	Mathematical representation of control system [ch2]	Lecture &Tutorial	Oral exam Home work
Week 3	3	An ability to use Signal flow graph Models, State variables of dynamic systems.	Mathematical representation of control system [ch2]	Lecture	Home work
Week 4	3	Understand the State equation and solution of state equation State	Mathematical representation of control system [ch2]	Lecture & Tutorial	Oral exam Home work

		diagram.			
Week 5	3	Analyze Controllability Observability of systems.	Fundamental of control system [ch3]	Lecture	Oral exam
Week 6	3	Analyze of state variable models , 1st Quiz	State variable models [ch4]	Lecture & Tutorial	Quiz Home work
Week 7	3	An ability to design with state feed back	State variable models [ch4]	Lecture	Oral exam Home work
Week 8	3		Mid-term exam.		Exam
Week 9	3	Understand the time response of 2nd order systems.	Transient and steady state response [ch5]	Lecture	Oral exam Home work
Week 10	3	Understand the Dynamic performance of 2nd order systems	Transient and steady state response [ch5]	Lecture & Tutorial	Oral exam Home work
Week 11	3	Apply the concept of stability	Control system analysis and design [ch6]	Lecture	Oral exam
Week 12	3	Analyze Routh-Hurwritz criterion Relative stability, 2nd Quiz	Control system analysis and design [ch6]	Lecture & Quiz	Quiz
Week 13	3	Apply root locus Design	Control system analysis and design [ch6]	Lecture	Oral exam
Week 14	3	Stability analysis by root locus,	Control system analysis and design [ch6]	Lecture & Tutorial	Oral exam Home work
Week 15	3		Final exam		Exam
201. Course Evaluation					

Quiz	2	5%
Assignment	8	20%
Midterm Exam	30	75%

202. Learning and Teaching Resources

Required textbooks(curricular books, if any)	Modern control Engineering by Katsuhiko ogata
Main references (sources)	Lectures and notes
Recommended books and references (scientific journals, reports)	Benjamin C. Kuo "Automatic Control System
Electronic references, websites	control system – Google Drive

Course Description Form

203.	Course Name:
Real Time Systems	

204.	Course Code:
CO403	

205.	Semester/Year:
Seven/ Fourth	

206.	Description Preparation Date:
28/3/2024	

207.	Available Attendance Forms:
Physical attendance	

208.	Number of Credit Hours(Total)/Number of Units(Total)
150/6	

209.	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	

210.	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.

211.	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	

212. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method

2	1	Learn basic of real time system	Classifying real time system, HW & SW	Lecture/lab	Oral Exam
2	2,3	Understand types of sensors	Sensors: Characteristics & types	Lecture/lab	Oral Exam Homework
2	4,5	Learn Signal conditioning	Signal conditioning	Lecture/lab	Oral Exam Homework
2	6,7	Understand data buses	Data buses.	lecture	Oral Exam Quiz
2	8	Learn types of storages	Types of storage devices, non–volatile memories & interconnection between them	lecture	Oral Exam
2	9	Understand single and multitasking	Single chip computer, board comp., multitasking	lecture	Oral Exam
2	10	Learn Real time application	Real time software–control & software application	Lecture/lab	Quiz
2	11	Understand Processes synchronization	Processes interconnections & synchronization	lecture	Homework
2	12,13	Learn scheduling	Real time scheduler, deadlocks	lecture	Exam
2	14	Learn Real time data base and Real time languages	Real time data base and Real time languages	lecture	Oral Exam
	15		**Final exam**		
			Classifying real time system, HW & SW		

213. Course Evaluation

5pts	2 quizzes
5pts	3 homework
5pts	reports

5pts	Project
20pts	Term Exam
10pts	Lab
50pts	Final Exam
100pts	Total

214. 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:
Wireless Networks

2. Course Code:
CO405

3. Semester/Year:
Seven / Fourth

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 the fundamental aspects of wireless networks, with emphasis on current and next-generation wireless networks. -The course should provide the students with a good understanding of the wireless networking concepts and research directions. 3-Various aspects of wireless networking will be covered including: Fundamentals of Wireless LAN IEEE 802.11, IEEE 802.11 Distributed Coordination Function (DCF) , Multiple Access Techniques and Hidden Node Problem, Bluetooth IEEE 802.15.1. -Introduction of Wireless Mesh Networks (WMNs), MAC and Network Layers of WMNs. - Introduction of Mobile Ad-Hoc Networks

		(MANET), MAC and Network Layers of Mobile Ad–Hoc Networks (MANET).
		- Introductions, Applications and Challenges of wireless sensor networks (WSNs), Energy Consumption and MAC (Media Address Control) Layer of Wireless ensor Networks, Routing Protocols of WSNs.
		-Introduction of Wireless Network Coding (WNC).
		- Introduction of Introduction to Internet of Things (IoT).

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 wireless networ	Introduction to Wireless Signal Propagation	Lecture	Oral exam
2	3	Explain and compare with various types of Coding And Modulation	Introduction to Wireless Coding And Modulation	Lecture & LAB	Quiz
3	3	Identify and describe the basics of wireless networks	Fundamentals of Wireless Networks Technology	Lecture & LAB	Oral exam Home work
4,5	6	Explain and compare various types of wireless networks IEEE 802.11	Wireless LANs (IEEE 802.11x)	Lecture & LAB	Quiz
6	3	Identify and describe IEEE 802.11 Distributed Coordination Function	IEEE 802.11 Distributed Coordination Function	Lecture	Oral exam Home work
7,8	6	Identify and describe Bluetooth IEEE 802.15.1	Bluetooth IEEE 802.15.1	Lecture	Quiz
9	3	Identify and describe the Internet of Thing	Introduction Internet of Things (IoT)	Lecture	Exam
10	3	Identify and describe the Wireless Mesh Networking (WMN)	Introduction Wireless Mesh Networking (WM	Lecture	Quiz
11,12	6	Identify and describe the Wireless Sensor Network (WSN)	Introduction Wireless Sensor Network (WSN)	Lecture & LAB	Quiz Oral exam

					Home work
13,14	6	Identify and describe the Mobile Ad Hoc Wireless Network (MANE	Introduction Mobile Ad Hoc Wireless Networ (MANET)	Lecture	Quiz Oral exam Home work
15	3	Identify and describe The Wireless Network Architecture and Wireless Device Roles	Wireless Network Architecture and Wireless Device Rol	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 Ian F. Akyildiz , Mehmet Can Vuran, "Wireless Sensor Networks", John Wiley and Sons, Ltd, Publication, first edit 2010
Main references (sources)	C. Siva Ram Murthy, and B. S. Manoj "Ad Hoc Wireless Networks Architectures and Protocols",Prentice Hall Professional Technical Reference, 2004
Recommended books and references (scientific journals, reports)	–––––
Electronic references, websites	–––––

Course Description Form

215.	Course Name:
	Parallel Computer Architecture
216.	Course Code:
	CO406
217.	Semester/Year:
	Seven / Fourth
218.	Description Preparation Date:
	31/3/2024
219.	Available Attendance Forms:
	In class
220.	Number of Credit Hours(Total)/Number of Units(Total)
	100/4
221.	Course administrator's name (mention all, if more than one name)
	Name: Dr. Ula Tarik Salim Email: ula.tariq@uomosul.edu.iq

222.	Course Objectives	
Course Objectives		Provides the necessary knowledge to • design a new computer system • improve an existing architecture • develop fast parallel computing algorithms systems

223.	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 expanding their critical thinking skills. This will be achieved through class interactive tutorials and by considering type of simple experiments involv some sampling activities that are interesting to the students.

224. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Understanding the factors that influence computer	Computer Speed and the	Lecture	Exam

		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	Architecture of Standard Computers		
2	3	Understand the advantages and challenges of parallel computing and how it can improve performance in certain applications	Flynn Classification	Lecture	Exam
3	3	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	Quiz, Exam
4	3	Study the memory hierarchy in computer systems and understand the role of cache memory in improving performance	Cache Memory	Lecture	Exam
5	3	Learn about cache organization, replacement policies, and cache coherence protocols	Cache Memory	Lecture	Report, Exam
6	3	Study memory interleaving technique to enhance memory	Memory Interleaving	Lecture	Assignment, Exam

		access efficiency			
7	3	Identify the hardware design for arithmetic operations (addition/ subtraction)	Parallel Arithmetic (Carry Save Adder)	Lecture	Assignment, Exam
8	3	Identify the hardware design for arithmetic operation (multiplication)	Parallel Arithmetic (Carry Save Multiplier)	Lecture	Exam
9	3		Mid-term Exam	Lecture	Exam
10	3	Understand the design principles, and applications associated with the parallel processing architectures including SIMD and vector processors	SIMD Architecture (Vector Processor)	Lecture	Exam
11	3	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	3	Understand the design principles, algorithms, and applications associated with the architecture DSP	Digital Signal Processor	Lecture	Exam
13	3	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	3	Understand the application and architecture of DFT and FFT Understand the design principles of 1D Systolic	Array Processor (DFT and FFT processor) Systolic Array Processor (1D)	Lecture	Exam

		Array Processor architecture and its application on 1D convolution			
15		Preparatory week before the final Exam			Exam

225. Course Evaluation

		Quizzes	15% (15)		
		Assignments	15% (15)		
		Report	10% (10)		
		Midterm Exam	10% (10)		

226. Learning and Teaching Resources

Required textbooks(curricular books, if any)	1. K. Hwang and F.A. Briggs "computer Architecture and parallel processing" 2. Peter Pirch "Architectures for DSP"
Main references (sources)	Lectures and notes
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

227.	Course Name:
Graduate Project	

228.	Course Code:
CO407	

229.	Semester/Year:
Eight / Fourth	

230.	Description Preparation Date:
3/4/2024	

231.	Available Attendance Forms:
In class	

232.	Number of Credit Hours(Total)/Number of Units(Total)
200/5	

233.	Course administrator's name (mention all, if more than one name)
Name: Email:	

234.	Course Objectives	
Course Objectives	● The purpose of the Graduation Project is assure/ascertain that the students have acquired skills, knowledge, and concepts necessary to perfo well when they leave the university. Each student use educational tools to broaden his/her knowled about a particular, self-selected topic. Students also expected to show how proficient they are solving real-world problems with certain constraints the outcome-based evaluation by the review board.

235.	Teaching and Learning Strategies

	Technical Report
Strategy	– Literature Review and Analysis
	– Project Problem Formulation and Solutions (Goals)
	– Report Organization – According to the template of the department
	Methodology and Procedures
	– Design
	– Implementation
	– Testing
	Individual Student Evaluation
	– Individual Contribution
	– Oral Presentation
	– Team Work
	Individual Student Evaluation by the Supervisor
	– Individual Contribution
	– Student Commitment
	– Team Work.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	5	Understand and apply the fundamentals of engineering design practices and procedures	Research Plan		
Week 2	5	Participate in teamwork activities.	Data collection		
Week 3	5	Implement the techniques of oral and written presentations.	Previous Works		
Week 4	5	Implement the techniques of oral and written presentations.	Study the Problem		

Week					
Week 5	5	Apply project management fundamentals.	Propose Solutions		
Week 6	5	Apply project management fundamentals.	Analysis of Proposed Solutions		
Week 7	5	Apply project management fundamentals.	Design the Proposed Solution		
Week 8	5	Apply project management fundamentals.	Solutions Application		
Week 9	5	Apply project management fundamentals.	Make the Required Measurements		
Week 10	5	Understand the ethics of the engineering profession and computer engineering issues	Analysis of the Results		
Week 11	5	Understand the ethics of the engineering profession and computer engineering issues	Design Reconsideration		
Week 12	5	Understand the ethics of the engineering profession and computer engineering issues	Project Testing and begin writing		
Week 13	5	Understand the ethics of the engineering profession and computer engineering issues	Project Writing		
Week 14	5	Interact with industry and related non-governmental organizations.	Project report submission		
Week 15	5	Interact with industry and related non-governmental organizations.	Presentation to the review board and oral examination		Exam

11. Course Evaluation:

		Supervisor evaluation		40%(50)	
		Presentation	2hr	50% (50)	

Required Textbooks:

Main reference :

Recommended Textbooks:

Electronic Reference/ Website:

Course Description Form

236.	Course Name:
Computer Graphics	

237.	Course Code:
CO408	

238.	Semester/Year:
Eight / Fourth	

239.	Description Preparation Date:
28/3/2024	

240.	Available Attendance Forms:
Physical attendance	

241.	Number of Credit Hours(Total)/Number of Units(Total)
100/4	

242.	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	

243.	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.

244.	Teaching and Learning Strategies	
Strategy		4- Apply knowledge of mathematics, science, and engineering. 5- Learn all basic mathematical behind computer graphic and animation design. 6- Ability to work effectively within multidisciplinary teams

245. Course Structure

Week	Hours	Required Learning	Unit or Subject Name	Learning Method	Evaluation Method

		Outcomes			
1,2	2	Understand basic operation of computer graphics	Introduction to computer graphics	lecture	Oral Exam
3,4	2	Learn DDA	DDA Algorithm	lecture	Oral Exam Homework
5,6	2	Learn BA	Bresenham Algorithm	lecture	Homework
7,8	2	Learn SC	Scan convers Algorithm	lecture	Quiz
9,10	2	Understand clipping	Clipping Algorithm	lecture	Oral Exam
10	2	Learn Transformations	Transformations	lecture	Quiz
11	2	Learn openGL	Introduction to Open	lecture	Oral Exam Homework
12	2	Code in OpenGL	OpenGL programmin	lecture	Oral Exam
13	2	Learn by examples	OpenGL examples	lecture	Oral Exam
14	2	Learn by application	OpenGL applications	lecture	Oral Exam
15					

246. Course Evaluation

5pts	2 quizzes
5pts	3 homework
5pts	reports
5pts	Project
20pts	Term Exam
60pts	Final Exam
100pts	Total

247. 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

248.	Course Name:
Cyber Security	
249.	Course Code:
CO409	
250.	Semester/Year:
Eight / Fourth	
251.	Description Preparation Date:
28-3-2024	
252.	Available Attendance Forms:
On site	
253.	Number of Credit Hours(Total)/Number of Units(Total)
4/250	
254.	Course administrator's name (mention all, if more than one name)
Name: Qutaiba I. Ali & Hussien Mahmood Email: Qutaibaali@uomosul.edu.iq hussein.mahmood@uomosul.edu.iq	
255.	Course Objectives
Course Objectives	1. Understanding Cryptographic Principles: Students will develop a comprehensive understanding of modern symmetric-key ciphers, including block and stream ciphering techniques. They will also gain knowledge of advanced encryption standards, such as the Data Encryption Standard (DES) and the Advanced Encryption Standard (AES). 2. Exploring Asymmetric-Key Cryptography: Students will learn about asymmetric-key cryptography, also known as public-key cryptography. They will understand the concepts of key pairs, encryption, decryption, and digital signatures. They will also explore the principles of cryptanalysis and key management and distribution. 3. Applying Message Integrity and

<table>
<tr><td></td><td colspan="2">Authentication: Students will gain knowledge of techniques for ensuring message integrity and authentication. They will learn about message authentication codes, cryptographic hash functions, and digital signatures. They will understand how these techniques are used to verify the integrity and authenticity of digital messages.

4. Understanding Network Security Technologies: Students will explore various network security technologies and protocols, including IPSec, SSL/TLS, PGP, VPNs, and firewalls. They will gain an understanding of their role in securing communication over networks and the principles behind their operation.

Examining Application Layer and Wireless LAN Security: Stude will learn about security mechanisms at the applicatio layer, including PGP (Pretty Good Privacy) and S/MIME (Secure/Multipurpose Intern Mail Extensions). They will al explore the unique security challenges and solutions associated with wireless LAN understanding the vulnerabilities and best practices for securing wireles networks</td></tr>
</table>

256.	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.

257. Course Structure

Week		Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1		4	Understand modern encryption techniques using symmetrical keys, including block and stream ciphering techniques.	Introduction to Modern Symmetric–Key Ciphers: Block and stream ciphering	Lecture	Homework

2	4	Gaining comprehensive knowledge of Data Encryption Standard (DES).	Data Encryption Standard (DES)	Lecture	Oral Exam
3	4	Learning about the Advanced Encryption Standard (AES).	Advanced Encryption Standard (AES)	Lecture	Oral Exam
4	4	Learning how to encrypt with asymmetric keys, also known as public–key cryptography.	Modern Symmetric–Key Ciphers	Lecture	Quiz
5	4	Learning about the concepts of key pairs, encryption, decryption, and digital signatures. Explore the principles of cryptographic analysis and key management and their distribution.	Asymmetric–key cryptography	Lecture	Homework
6	4	Gaining knowledge about techniques to ensure message integrity and authentication. Learning about message authentication codes.	Message Integrity and Message Authentication	Lecture	Oral Exam
7	4	Knowing about the functions of hash cryptography and use them in symbolic hashing.	Cryptographic Hash Functions	Lecture	Report
8	4	Use of digital signature techniques to verify the integrity and authenticity of digital messages.	Digital Signature	Lecture	Quiz
9	4	Learning about authentication techniques and their working principles.	Entity Authentication	Lecture	Oral Exam
10	4	Understanding the role of transport protocols in securing communication over networks and their	Security at the Transport Layer: SSL and TLS	Lecture	Homework

		working principles.			
11	4		Midterm Exam		Exam
12	4	Identifying the role of security protocols and how they work in achieving online security.	Security in the internet: IPSec, SSL/TLS	Lecture	Homework
13	4	Understanding the role of protocols in securing a virtual private connection over the public internet.	PGP,VPN	Lecture	Oral Exam
14	4	Learning about how to achieve firewalls on devices and network.	Firewalls	Lecture	Oral Exam
15	4		Final Exam		Exam

258. Course Evaluation

Quizzes	2	10% (10)
Assignments	2	10% (10)
Projects	1	10% (10)
Report	1	10% (10)
Midterm Exam	3 hr	10% (10)

259. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	Tanenbaum A.S. , "Computer Network",5th, Edition, Prentice−Hall Publishing,2014 Forouzan B.,"Data, Communications and Networking", '5th Edition McGraw−HillPublishing,2013
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

260. Course Name:	
Mobile Systems Fundamentals	
261. Course Code:	
CO410	
262. Semester/Year:	
Eight / Fourth	
263. Description Preparation Date:	
2/4/2024	
264. Available Attendance Forms:	
Lectures and Lab	
265. Number of Credit Hours(Total)/Number of Units(Total):	
150 Hours /6 Units	
266. Course administrator's name	
Name: Asst. Prof. Dr. Mayada Faris Ghanim	
Email: mayada.faris@uomosul.edu.iq	
Name: Mohammad Tariq Mohammad	

267. Course Objectives	
Course Objectives	• Comprehensive understanding of mobile systems and their practical applications.
	• Knowledge of fundamental principles, concepts, and components of mobile systems.
	• Familiarity with various mobile technologies, including cellular networks and wireless communication.
	• Proficiency in mobile application development using programming languages and tools.
	• Awareness of security challenges and privacy considerations in mobile systems.
	• Ability to design and develop user-friendly mobile applications.
	• Critical thinking and problem-solving skills for mobile

	●	system challenges.
	●	Research and evaluation capabilities for emerging mobile system trends.
	●	Effective collaboration and communication skills in mobile system projects.
	●	Consideration of ethical implications in mobile system development.
	●	Emphasis on lifelong learning to keep up with evolving mobile technologies.
	●	Preparation for careers in mobile app development, system management, or technology research.

268. Teaching and Learning Strategies

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

269. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	5	Understanding Mobile System Architecture	Introduction to Mobile Systems	Theory & Lab	Exam
2	5	Understanding Mobile System Architecture	Mobile System Architecture Part 1	Theory & Lab	Exam Quiz
3	5	Understanding Mobile System Architecture	Mobile System Architecture Part 2	Theory & Lab	Exam
4	5	Exploring Mobile	Mobile data	Theory	Exam

		Data Management	management: Conflict detection and resolution, Partial replication Part 1	& Lab	Report
5	5	Exploring Mobile Data Management	Mobile data management: Conflict detection and resolution, Partial replication Part 2	Theory & Lab	Exam Report
6	5	Understanding Mobile interface	Mobile Systems Interface	Theory & Lab	Exam
7	5	Examining Location Awareness and Privacy	Location awareness and Location privacy Part 1	Theory & Lab	Exam Report
8	5	Examining Location Awareness and Privacy	Location awareness and Location privacy Part 2	Theory & Lab	Exam Assignment
9	5	Understanding Mobile Networks	Mobility models for Wireless Networks	Theory & Lab	Exam Quiz
10	5	Understanding Mobile Networks	Fundamentals of modern Cellular Networks and their architectures	Theory & Lab	Exam Quiz Assignment
11	5		Midterm Exam		
12	5	Understanding Mobile Networks	Mobile ad-hoc networks and sensor networks	Theory & Lab	Exam Quiz

13	5	Understanding Mobile Networks	Mobile Systems and cloud computing Part 1	Theory & Lab	Exam Report
14	5	Understanding Mobile Networks	Mobile Systems and cloud computing Part 2	Theory & Lab	Exam Report
15	5	Exploring Mobile System Security	Mobile security platforms	Theory & Lab	Exam Assignment

270. Course Evaluation

3 Quizzes: 15% (15)

3 Assignments: 10% (10)

5 Reports: 10% (10)

1 Lab Exam: 5% (5)

1 Midterm Exam: 10% (10)

1 Final Exam: 50% (50)

271. Learning and Teaching Resources

Required textbooks(curricular books, if any)	• D. P. Agrawal and Qing-An Zeng, "Introduction to Wireless & Mobile Systems," Cengage Learning • John Krumm, "Ubiquitous Computing Fundamentals", CRC Press • Wei-Meng Lee , Beginning Android 4 Application Development , Wiley

Course Description Form

272.	Course Name:
	Image Processing and Applications
273.	Course Code:
	CO411
274.	Semester/Year:
	Eight / Fourth
275.	Description Preparation Date:
	28/3/2024
276.	Available Attendance Forms:
	Physical attendance in class
277.	Number of Credit Hours(Total)/Number of Units(Total)
	75/3
278.	Course administrator's name (mention all, if more than one name)

Name: Akram Abdul Mawjood Dawood, Dr. Ali Mukhlif Ahmed Al–Saegh

Email: akram.dawood@uomosul.edu.iq , ali.alsaegh@uomosul.edu.iq

279.	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.

280.	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.

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
		281. Course Structure			
Week1	2hr	**Identify a wide-range of image processing techniques and applications**.	Introduction & Fundamentals of digital Image processing and applications.	Lecture	Oral Exam
Week2	2hr	Describe how digital images are represented, manipulated, encoded, compressed and processed.	Image analysis, preprocessing, ROI, Image Algebra.	Lecture	Homework
Week3	2hr	Understanding image types, Spatial Filters and Image quantization methods.	Spatial Filters	Lecture	Quiz
Week4	2hr	Applying the edge detection, operators and masks on images.	Edge detection.	Lecture	Homework. Report
Week5	2hr	Explain the purpose of each process and the underlying mathematical principles.	Image quantization methods.	Lecture	Quiz
Week6	2hr	Applying the edge detection, operators and masks on images.	Operators, Masks.	Lecture	Oral Exam
Week7	2hr	Analyzing noise and blur types.	Noise and blur images removals	Lecture	Homework
Week8	2hr	Executing and designing appropriate image	System model, Image	Lecture	Quiz

		restoration systems.	restoration.		
Week9	²hr	Executing and designing appropriate image restoration systems.	Measurements of im quality.	Lecture	Homework
Week10	²hr	Implementing image compression and decompression methods.	Image Compression types	Lecture	Quiz
Week11	²hr	Implementing image compression and decompression methods.	Image coding	Lecture	Homework
Week12	²hr	Monitoring recent developments in the field of image transforms and biometric application.	Discrete Transform (FFT, Cosine transforms and Wavelet transform)	Lecture	Oral Exam
Week13	²hr	Implementing image compression and decompression methods.	JPEG & JPEG 2000	Lecture	Homework
Week14	²hr	Monitoring recent developments in the field of image transforms and biometric application.	Introduction to biometric systems types and applications	Lecture	Quiz

					Final Exam
Week15	2hr				

282. 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 .As illustrated in the table below

Weight (Marks)	Time/Number		
15% (15)	2	Quizzes	
10% (10)	2	Online Assignments	Formative
5% (5)	1	Onsite Assignments	assessment
10% (10)	1	Report	
10% (10)	2 hr	Midterm Exam	Summative
50% (50)	3hr	Final Exam	assessment
100% (100 Marks)			Total assessment

283. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	• Gonzalez, Rafael C._ Woods, Richard E. - Digital image Processing • Lectures and notes
Recommended books and references (scientific journals, reports)	Umbaugh, Scott E. *Digital image processing and analysis: applications with MATLAB® and CVIPtools.* CRC press, 2017. Zhang, Yu-Jin. *A Selection of Image Processing Techniques: From Fundamentals to Research Front.*

	CRC Press, 2022.
Electronic references, websites	