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

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: Courses
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

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

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	9	19		
College Requirements	11	24		
Department Requirements	41	111		
Summer Training				The student must complete 4 weeks of summer training to fulfill the requirements for the bachelor's degree
Other				

7. **Program Description**				
Year/Level	**Course Code**	**Course Name**	**Credit Hours**	
2020-2021/First S1	UOMC101	English Language	**theoretical**	**practical**
2020-2021/First S1	UOMC102	Computer	٣	٠
2020-2021/First S1	UOMC103	Human Rights	٢	٢
2020-2021/First S1	ENGC121	Calculus I	٢	٠

2020-2021/First S1	ENGC123	Engineering Drawing	٣	٠
2020-2021/First S1	ENGC135	Engineering Work Shop	٠	٣
2020-2021/First S1	EDLA101	Electrical & Digital Lab I	٢	٠
2020-2021/First S1	PHYS102	Physics	٠	٣
2020-2021/First S1	DILO103	Digital Logic	٣	٠
2020-2021/First S2	UOMC100	Arabic Language	٢	٠
2020-2021/First S2	-	Manufacturing Processes	٢	٠
2020-2021/First S2	-	Environmental Pollution	٢	٠
2020-2021/First S2	-	Information Technology	٢	٣
2020-2021/First S2	-	Electrical Establishments	٢	٠
2020-2021/First S2	-	Modeling of Building Materials	٢	٠
2020-2021/First S2	ENGC122	Calculus II	٣	٠
2020-2021/First S2	ENGC124	Auto CAD		٣
2020-2021/First S2	ELPD150	Electronic Physics & Devices	٣	٠
2020-2021/First S2	ECAN151	Electrical Circuits Analysis	٣	٢
2020-2021/First S2	DSDE152	Digital System Design	٣	١
2020-2021/First S2	COOP153	C++ & Object Oriented Programing	٢	٢
2020-2021/Second S1		English Language-Pre-intermediate	١	٠
2020-2021/Second S1	ENGE229	Engineering Mathematics I	٣	٠
2020-2021/Second S1	ENGC226	Engineering Economics	٢	٠
2020-2021/Second S1	ENGC227	Statistics	٢	٠
2020-2021/Second S1	ELCI202	Electronics Circuits	٣	٢
2020-2021/Second S1	DAST203	Data Structures	٢	٢
2020-2021/Second S1	MIPR204	Micro-Processor I	٢	٢
2020-2021/Second S1	PLDE205	Programmable Logical Design	٢	٠
2020-2021/Second S2	ENGE220	Numerical Analysis	٢	٠

2020-2021/Second S2	ENGC225	Engineering Management	٢	٠
2020-2021/Second S2	ENGE230	Engineering Mathematics II	٣	٠
2020-2021/Second S2	DIEL251	Digital Electronics	٣	٢
2020-2021/Second S2	MIPR252	Micro-Processor II	٢	٢
2020-2021/Second S2	MECO257	Magnetics & Energy Conversion	٢	٠
2020-2021/Second S2	RECO255	Reconfigurable Computing	٢	٠
2020-2021/Second S2	INTH254	Information Theory	٢	٠
2020-2021/Second S2	DIMA256	Discrete Mathematics	٢	٠
2022-2023/Third S1		English language – Intermediate	٢	٠
2022-2023/Third S1	CONE302	Computer Network I & Data Communication	٣	٢
2022-2023/Third S1	SISY304	Signals & Systems	٣	٠
2022-2023/Third S1	COAR305	Computer Architecture I	٣	٠
2022-2023/Third S1	COIN306	Computer Interface	٢	٢
2022-2023/Third S1	OPSY307	Operating System I	٢	٢
2022-2023/Third S1	AMPR310	Advanced Micro-Processor	٢	٠
2022-2023/Third S1	SOCO311	Soft Computing	٢	٠
2022-2023/Third S2	CONE351	Computer Network II	٢	٢
2022-2023/Third S2	DSPR352	Digital Signal Processing	٣	٠
2022-2023/Third S2	COAR353	Computer Architecture II	٣	٠
2022-2023/Third S2	OPSY 354	Operating System II	٢	٢
2022-2023/Third S2	EMSY358	Embedded System	٢	٢
2022-2023/Third S2	VLSI356	VLSI Circuits	٢	٠
2022-2023/Third S2	IMPR355	Image Processing	٢	٠
2022-2023/Third S2	OPTI357	Optimization	٢	٠
2022-2023/Third S2	DASY359	Database System	٢	٠
2022-2023/Fourth S1	ENGE429	Public Safety	٢	٠
2022-2023/Fourth S1		Graduation Project I	٢	٠
2022-2023/Fourth S1	COSY403	Control Systems	٣	٢
2022-2023/Fourth S1	RETS404	Real Time Systems	٢	٢

2022-2023/Fourth S1	COGR405	Computer Graphics	٢	٠
2022-2023/Fourth S1	ARIN409	Artificial Intelligence	٣	٠
2022-2023/Fourth S1	WINE406	Wireless Network	٢	٠
2022-2023/Fourth S1	ACAR408	Advanced Computer Architecture	٢	٠
2022-2023/Fourth S1	OPCO407	Optical Communication	٢	٠
2022-2023/Fourth S1	BIEN411	Biometric Engineering	٢	٠
			٢	٠
2022-2023/Fourth S2		English language– Upper Intermediate	٢	٠
2022-2023/Fourth S2	UOMC104	Professional Ethics	٢	٠
2022-2023/Fourth S2	GRPR450	Graduation Project II	٢	٠
2022-2023/Fourth S2	DICO452	Digital Control	٣	٢
2022-2023/Fourth S2	SOEN451	Software Engineering	٢	٠
2022-2023/Fourth S2	NESE453	Network Security	٢	٠
2022-2023/Fourth S2	SPPR456	Special Purpose Processors	٢	٠
2022-2023/Fourth S2	NAMA455	Network Application & Management	٢	٠
2022-2023/Fourth S2	DISY457	Distributed System	٢	٠
2022-2023/Fourth S2	INNE454	Industrial Network	٢	٠
2022-2023/Fourth S2	ANPR458	Antenna and Propagation	٢	٠
2022-2023/Fourth S2	INCO459	Intelligent Control	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 lMahmood	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	

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

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
	UOMC101	English Language	Basic	•								•			
	UOMC102	Computer	Basic	•								•			
	UOMC103	Human Rights	Basic	•				•				•			
	ENGC121	Calculus I	Basic	•				•							
	ENGC123	Engineering Drawing	Basic	•				•	•						
	ENGC135	Engineering Work Shop	Basic	•				•							
	EDLA101	Electrical & Digital Lab I	Basic	•				•				•			
	PHYS102	Physics													
	DILO103	Digital Logic	Basic	•				•	•			•			
	UOMC100	Arabic Language	Basic	•								•			
	-	Manufacturing Processes	Basic	•				•							
	-	Environmental Pollution	Basic	•				•	•			•			
	-	Information Technology	Basic	•				•	•			•			
	-	Electrical Establishments													
	-	Modeling of Building Materials	Basic	•				•							

	ENGC122	Calculus II	Basic	•				•	•							
	ENGC124	Auto CAD	Basic	•				•	•			•				
	ELPD150	Electronic Physics & Devices	Basic	•								•				
	ECAN151	Electrical Circuits Analysis	Basic	•				•	•			•				
	DSDE152	Digital System Design	Basic	•				•	•			•				
	COOP153	C++ & Object Oriented Programing														
		English Language-Pre-intermediate	Basic	•				•								
	ENGE229	Engineering Mathematics I	Basic	•				•								
	ENGC226	Engineering Economics	Basic	•								•				
	ENGC227	Statistics	Basic	•				•	•			•				
	ELCI202	Electronics Circuits	Basic	•				•	•			•				
	DAST203	Data Structures	Basic	•				•				•				
	MIPR204	Micro-Processor I														
	PLDE205	Programmable Logical Design	Basic	•				•	•			•				
			Basic	•				•								
	ENGE220	Numerical Analysis	Basic	•				•	•			•				
	ENGC225	Engineering Management	Basic	•				•								
	ENGE230	Engineering Mathematics II	Basic	•				•								
	DIEL251	Digital Electronics	Basic	•				•								
	MIPR252	Micro-Processor II		•				•	•			•				
	MECO257	Magnetics & Energy Conversion	Basic	•				•	•			•				

	RECO255	Reconfigurable Computing	Basic	•				•	•			•			
	INTH254	Information Theory	Basic	•				•							
	DIMA256	Discrete Mathematics	Basic	•				•							
		English language – Intermediate	Basic	•								•			
	CONE302	Computer Network I & Data Communication	Basic												
	SISY304	Signals & Systems	Basic	•								•			
	COAR305	Computer Architecture I	Basic	•				•	•			•			
	COIN306	Computer Interface	Basic	•				•	•			•			
	OPSY307	Operating System I	Basic	•				•							
	AMPR310	Advanced Micro-Processor	Basic	•				•	•			•			
	SOCO311	Soft Computing	Basic	•				•	•			•			
			Basic												
	CONE351	Computer Network II													
	DSPR352	Digital Signal Processing	Basic	•				•	•			•			
	COAR353	Computer Architecture II	Basic	•				•				•			
	OPSY 354	Operating System II	Basic	•				•							
	EMSY358	Embedded System	Basic	•				•				•			
	VLSI356	VLSI Circuits	Basic	•								•			
	IMPR355	Image Processing	Basic	•				•	•			•			
	OPTI357	Optimization	Basic	•				•	•			•			
	DASY359	Database System	Basic	•				•	•			•			
	ENGL429	Public Safety	Basic	•				•	•			•			

	Graduation Project I	Basic	•				•				•			
COSY403	Control Systems	Basic	•				•							
RETS404	Real Time Systems	Basic	•				•				•			
COGR405	Computer Graphics	Basic	•								•			
ARIN409	Artificial Intelligence	Basic	•				•	•			•			
WINE406	Wireless Network	Basic	•				•	•			•			
ACAR408	Advanced Computer Architecture	Basic	•				•	•			•			
OPCO407	Optical Communication	Basic	•				•				•			
BIEN411	Biometric Engineering	Basic	•								•			
		Basic	•				•	•			•			
	English language– Upper Intermediate	Basic	•				•	•			•			
UOMC104	Professional Ethics	Basic	•				•	•			•			
GRPR450	Graduation Project II	Basic	•				•	•			•			
DICO452	Digital Control	Basic	•				•	•			•			
SOEN451	Software Engineering	Basic	•				•	•			•			
NESE453	Network Security	Basic	•				•				•			
SPPR456	Special Purpose Processors	Basic	•								•			
NAMA455	Network Application & Management	Basic	•				•	•			•			
DISY457	Distributed System	Basic	•				•	•			•			

	INNE454	Industrial Network	Basic	•				•	•			•				
	ANPR458	Antenna and Propagation	Basic	•				•	•			•				
	INCO459	Intelligent Control	Basic	•				•	•			•				
	ENGE429	Public Safety	Basic	•				•	•			•				
		Graduation Project I	Basic	•				•				•				

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

Course Description Form

1. Course Name:
Electrical Circuits Analysis
2. Course Code:
ECAN151
3. Semester/Year:
Second semester / First year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
In class
6. Number of Credit Hours(Total)/Number of Units(Total)
75/4
7. Course administrator's name (mention all, if more than one name)
Name: Dr Ahmed Mamoon Fadhil Email: ahmedalkababji72@uomosul.edu.iq
8. Course Objectives

Course Objectives	• To develop problem solving skills and understanding of circuit analysis theorems through the application of (superposition, source transformation, mesh analysis, Nodal analysis) • To Determine the conditions for maximum power transfer to any circuit element • To understand the importance of transients in RL, RC & RLC. • To understand the principals of Resonant circuits • To understand the principals of Three-phase circuits

9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to 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 t are interesting to the students

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	5	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	5	Apply circuit analysis theorems (superposition, source transformation, mesh analysis, Nodal analysis)	Circuit theory: superposition [ch3,5,8,9] +quiz	Lecture &Lab	Quiz
Week 3	5	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	5	Apply circuit analysis theorems (superposition, source transformation,	Circuit theory: nodal analysis [ch3,5,8,9] +quiz	Lecture &Lab	Quiz

		mesh analysis, Nodal analysis)			
Week 5	5	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	5	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	5	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	5		Mid exam		Exam
Week 9	5	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	5	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	5	Analyse transient responses of RL, RC and RLC for various circuit configurations	Transient circuits: RC circuit's [ch7]	Lecture	Oral exam Home work

Week 12	5	Analyse transient responses of RL, RC and RLC for various circuit configurations	Transient circuits: RLC circuit's [ch7] +quiz	Lecture &Lab	Quiz
Week 13	5	Get an introduction to Resonant circuits and Three-phase circuits	Resonant circuits [ch11] +quiz	Lecture	Oral exam Home work
Week 14	5	Get an introduction to Resonant circuits and Three-phase circuits	Three –phase circuits [ch11]	Lecture &Lab	Quiz
Week 15	5	All	Preparatory week before the final Exam		

11.

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

12. Learning and Teaching Resources

Required textbooks(curricular books, if any)	BASIC ENGINEERING CIRCUIT ANALYSIS 10th Ed by J. Irwin
Main references (sources)	
Recommended books and references (scientific journals, reports)	Textbooks: Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw−Hill Education
Electronic references, websites	

Course Description Form

1. Course Name:

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.

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

		Express ideas, opinions, and experiences clearly and coherently. Demonstrate active listening skills and respond appropriately to others. 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	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		

		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 as quiz assignments, reports, online assessment, paper exam.	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	SOARS, J. & SOARS, L. 2014. New Headway: Intermed Fourth Edition: Student's Book and iTutor Pack, OUP Oxford.
Main references (sources)	
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

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 in deliver this module is to encourage students' participation in the exercis while at the same time refining and expanding their critical think skills. This will be achieved through classes, interactive tutorials and considering type of simple experiments involving some sampl 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

Week 4	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 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 accurately convey measurements and annotations.	Lab 7: Annotation I, Modify IV, Inquiry: 1- Style, Text, Mtext, Ddedit, 2- ID, Dist, Area, Massprop	Lab	Quiz
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 center and other relevant tools.	Lab 12: Block II: Parametric constraints. 2- Dynamic Block. 3- Tool paleΣes. 4- Jpgout, Bmpout.	Lab	Oral exam Home work
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, use different font types, and utilize dimension styles to accurately convey measurements and annotations.	Plot Drawings: 1- Mspace, Pspace. 2- Mviewport. 3- Layouts. 4- Plot.	Lab	Quiz
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)	gineering Drawing and Graphic Technology, : French &Vierk , 12th edition, 1978 toCAD, 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

1. Course Name:
Digital System Design
2. Course Code:
DSDE152
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):
45/3
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 introduce the concepts of sequential logic circuit (analysis and design_ and programmable logic devices).

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
Week 1	4	Understanding digital systems	Introduction to Digital Systems Design	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 2	4	develop a s understanding MSI devices	Implementing Logic Functions using MSI Programmable Devices	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 3	4	develop a s understanding MSI devices	Implementation Technol Trade-offs PLDs	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 4	4	develop a s understanding MSI devices	Design and Analysis of MSI Digital Devices	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 5	4	analyze cloc sequential circuit	SD, ASM chart, transition Map, Tim	Lecture, Tutoria	Quiz,Assignment, Exam

			Diagram		
Week 6- 7	4	analyze cloc sequential circuit	Synchronous sequential Mealy and Moor circuits	Lecture, Tutoria	Quiz,Assignment, Exam
Week 8	4	implement synchronous cou logic systems	Synchronous Counter Design	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 9	4	implement synchronous regi logic systems	Register Design	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 10-11	4	study concepts programmable technologies	Synchronous design using PLD	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 12-13	4	model b asynchronous l circuits	Asynchronous cct. Fundamental mode and pulse Mode. Design steps	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 14-15	4	understand hazard combinational l circuits	Hazards	Lecture, Lab, Tutorial	Quiz,Assignment, Exam

11. Course Evaluation

Quizzes, Assignments, Projects/Lab, Reports, Midterm Exam, Final Exam.

12. Learning and Teaching Resources

Required textbooks(curricular bool if any)	Modern digital design by Richard S. Sandige (McGraw-Hill1990) Digital Fundamentals, 9 th Edition, Thomas L. Floyd, Pearson Prentice Hall, 2006. Digital Design, 5th edition, Morris Mano, Pearson Prentice Hall, 2013.
Main references (sources)	
Recommended books and references (scientific journals, reports)	Introduction to Logic Design, 3rd edition, Alan Marcovitz, McGraw-Hill, 2010.
Electronic references, websites	

Course Description Form

1. Course Name:	
Calculus II	
2. Course Code:	
ENGC122	
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)	
4/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Samar Ammar Yasir Email: samarammar@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	4	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	
Week 2	4	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	
Week 3	4	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	4	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	
Week 5	4	Understand and analyze the properties of inverse functions.	Inverse functions [ch1] Logarithm defined as an integral [ch7] +quiz	Lecture & Tutorial	Quiz

Week 6	4	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	Home work
Week 7	4	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
Week 8	4	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	Home work
Week 9	4		Mid exam		Exam
Week 10	4	Utilize techniques of integration by using basic integration formulas.	Techniques of integration using basic integration formulas. [ch8]	Lecture & Tutorial	Quiz Home work
Week 11	4	Utilize techniques of integration, such as integration by parts.	Integration by parts. Tabular integration. [ch8]	Lecture & Tutorial	

Week 12	4	Apply and use techniques of trigonometric integrals.	Trigonometric integrals.[ch8]	Lecture & Tutorial	
Week 13	4	Use trigonometric substitutions to simplify and solve complex mathematical integration.	Trigonometric substitutions.[ch8] +quiz	Lecture & Tutorial	Quiz Home work
Week 14	4	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	4		**Final exam**		Exam
11. Course Evaluation:					
		Quizzes	5	20% (25)	
		Assignments	5	16% (15)	
		Midterm Exam	1.5 hr	20% (20)	
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

1. Course Name:

Computer

2. Course Code:

UOMC102

3. Semester/Year:

One/ first year

4. Description Preparation Date:

1-4-2024

5. Available Attendance Forms:

Class/ lab

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

4 hours in each week/ 3

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

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

8. 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.

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
Week 1	3	Understand the fundamental concepts of computer hardware and software.	Computers and Operating System	Lecture&Lab	Quiz
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	Assignment
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 Hardware	Lecture&Lab	Quiz
Week8	3	Demonstrate knowledge of computer components and their functions.	Computer Hardware	Lecture&Lab	Oral exam
Week 9	3		Monthly Exam	Lecture&Lab	Exam
Week10	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 11	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	Assignemnet

Week 12	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 13	3	Utilize Microsoft Excel essentials for data organization,	Getting Started with Excel Essentials	Lecture&Lab	Oral exam
Week 14	3	Create and manage worksheets using Microsoft Excel. Organize and format data effectively	Organizing and Enhancing Worksheets	Lecture&Lab	Quiz
Week 15	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

11. Course Evaluation

			Time/Number	**Weight (Marks)**	
		Quizzes	2	10% (10)	
		Assignments	2	5% (5)	
		Lab.	5	10% (10)	
		Midterm Exam	1	25% (25)	

		Final	1	50%(50)	

12. 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

1. Course Name:	
Electronics Physics & Devices	
2. Course Code:	
ELPH117	
3. Semester/Year:	
2/2022	
4. Description Preparation Date:	
27/3/2024	
5. Available Attendance Forms:	
Face to face	
6. Number of Credit Hours(Total)/Number of Units(Total)	
3 hours and 3 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Nada Ismaial Email: nada.ismail@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	Focus on providing students with a comprehensive understanding of semiconductor devices, including diodes and transistors. By achieving these

	learning outcomes, students will develop the necessary knowledge and skills to analyze and apply these electronic components in various electronic systems and applications.

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Concepts of Modern Physics	Explain the concepts of modern physics	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
2	3	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	3	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	3	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	3	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	3	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	3	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	3	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	3	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	3	Diode Approximations	Explain the diodes circuits	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
11	3	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	3	Diodes applications 2	Discussions the applications 2	Explain the main concepts face to face through an interactive	Theoretical and practical test with

				presentation of the subject	written and oral quizzes
13	3	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	3	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	3		Review the main concepts before the final test	Review the main concepts before the final test	Theoretical and practical test with written and oral quizzes

11.Course Evaluation

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

Quizzes and participation 10%
Assignments 10%
Report 10%
Projects 10%
Pre-final test 10%
Final theoretical and practical test 50%

12.Learning and Teaching Resources

Required textbooks(curricular books, if any)	1. فيزياء الإلكترونيات، وكاع الجبوري 2. الخواص الكهربائية والمغناطيسية للمواد، وكاع الجبوري
Main references (sources)	Concepts of Modern Physics, Arthur Beiser, Kent A. Peterson Material Science, Kakani Electronic Devices, Thomas L. Floyd, 10th edition, 2018
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name:	
Digital Logic	
2. Course Code:	
DILO103	
3. Semester/Year:	
1st 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):	
45/3	
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 a thorough understanding of the binary system, Boolean algebra, logic gates, Karnaugh map, digital comparator and decoding circuits and their applications.
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
Week 1	3	Understanding digital systems	Fundamentals of digital system	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 2,3	3	Understanding Boolean alge laws	Boolean algebra and logic gates	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 4,5	3	Understanding logic gates	Describing the operation of a logic circuit	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 6,7	3	Utilize Karna maps as graphical minimization too	Minimization by Karnaugh maps	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 8	3	Utilize Karna maps as graphical minimization too	Five and six variable k-map	Lecture, Tutorial	Quiz,Assignment, Exam
Week 9	3	Utilize Karna maps as graphical minimization too	Multiple function minimizatior	Lecture, Tutorial	Quiz,Assignment, Exam
Week 10	3	Utilize Karna maps as graphical minimization too	Variable-entered k-map	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 11	3	Identifying diffe number system	Number systems	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 12	3	Design dig adder-subtracto	Adders and subtractors	Lecture, Lab, Tutorial	Quiz,Assignment, Exam

		circuits			
Week 13	3	Study the sig and unsig numbers	Unsigned and signed numbers	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 14	3	Design dig circuits magnitude comparator	Digital comparator circuits	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 15	3	Design dig decoder circuits	Digital decoder circuits	Lecture, Lab, Tutorial	Quiz,Assignment, Exam

11. Course Evaluation	
Quizzes, Assignments, Projects/Lab, Reports, Midterm Exam, Final Exam.	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Digital Fundamentals, 9 th Edition, Thomas L. Floyd, Pearson Prentice Hall, 2006. Digital Design, 5th edition, Morris Mano, Pearson Prentice Hall, 2013.
Main references (sources)	
Recommended books and references (scientific journals, reports)	Introduction to Logic Design, 3rd edition, Alan Marcovitz, McGraw-Hill
Electronic references, websites	

Course Description Form

1. Course Name:
English Language Pre-Intermediate
2. Course Code:
N/A

3. Semester/Year:	
First Semester / Second 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)	
30/1	
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 Getting to know you!: 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 Getting to know you: Speaking: Missing words.	In Class Lecture	Quiz
3	2	Learn the art of listening by analyzing and applying synonyms	UNIT 1 Getting to know you!: 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	In Class Lecture	homework

			how to make a good presentation.		
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 Whatever makes you happy: 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 Whatever makes you happy: 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 Whatever makes you happy: Listening: Dreams come true. Vocabulary: Hot verbs, make and do.	In Class Lecture	homework
9	2	And learn grammar for the class	UNIT 3 What's in the s: Grammar: Narrative ses. Reading: Book at bedtime.	In Class Lecture	daily oral
10	2	Learn conversation for class and speaking style	UNIT 3 What's in the news: Speaking: Giving and receiving news.	In Class Lecture	daily oral
11	2	Learn the art of listening by analyzing and applying synonyms	UNIT 3 What's in the news: 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	10

Homework	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: Pre-Intermediate Fo 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/Preintermediate/?c us&selLanguage=en

Course Description Form

1. Course Name:
Statistics
2. Course Code:
ENGC227
3. Semester/Year:
First Semester/ Second Level
4. Description Preparation Date:
29/3/2024
5. Available Attendance Forms:
Physical attendance
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: amar daood

Email: amar.daood@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Learn all principles and basics of the statistics. • Be familiar with the Descriptive and Inferential statistics. • understand Concepts of Probability Theory.

9. Teaching and Learning Strategies

Strategy	1- Apply knowledge of mathematics, science, and engineering. 2- Learn all basic mathematical of statistics and probability. 3- The student should be able to understand and analyze dataset.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1,2	2	Learn basic of statistics	Role of statistics in science, types of statistics (Descriptive and Inferential), data presentation (Arithmetic mean, Median, Mode).	lecture	Oral Exam
3,4	2	Learn types of statistics	Descriptive statistics, histogram frequency distribution, data limits, data tabulations, polygon, ogive.	lecture	Oral Exam Homework
4,5	2	Understand the basic of probability	Basic Concepts of Probability Theory (random events and sample space),	lecture	Homework

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

11. Course Evaluation

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

12. Learning and Teaching Resources

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

Course Description Form

1. Course Name:
Engineering Mathematics 1
2. Course Code:
ENGE229
3. Semester/Year:
First Semester / Second year
4. Description Preparation Date:
7/4/2024
5. Available Attendance Forms:
In class / on meet
6. Number of Credit Hours(Total)/Number of Units(Total)
45 hr./ 3 unit
7. 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
8. Course Objectives

Course Objectives	• This course gives the students some more advanced subjects in engineerir mathematics as partial derivative, differential equations, series and Fourier series and Multiple Integrals; this is to prepare the student for the next cou and the other subjects like the numerical and engineering 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

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
Week 1	3	Ability to solve multivariable functions with knowledge of their properties	Limits and continuity (multivariable functions)	Lecture	Quiz,Assignment, Exam
Week 2	3	Ability to solve Partial derivatives with knowledge of their propertie	Partial derivatives (definitions, functions of more than two variables)	Lecture	Quiz,Assignment, Exam
Week 3	3	Ability to solve Chain rule for functions by using two or three variables and Solve maxima and	Chain rule for functions of two or three variables , Maxima and minima and	Lecture	Quiz,Assignment, Exam

		minima and saddle point	saddle point		
Week 4	3	Ability to solve Double integral Cartesian integrals form with knowledge of their properties	Double integral (properties, Cartesian integrals form)	Lecture	Quiz,Assignment, Exam
Week 5	3	Ability to solve Double integral by Changing Cartesian integrals into polar form	Double integral (Polar form, Changing Cartesian integrals into polar form)	Lecture	Quiz,Assignment, Exam
Week 6	3	Ability to solve Triple integrals in Cartesian coordinates with knowledge of their properties	Triple integrals (Properties, Triple integrals in Cartesian coordinates)	Lecture	Quiz,Assignment, Exam
Week 7	3	Ability to solve Triple integrals in cylindrical coordinate with knowledge of their properties	Triple integrals (Triple integrals in cylindrical coordinates)	Lecture	Quiz,Assignment, Exam
Week 8	3	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 integrals (Application)	Lecture	Quiz,Assignment, Exam
Week 9	3	Ability to solve Fourier series,	Fourier Series	Lecture	Quiz,Assignment, Exam

		Trigonometric form with knowledge of their properties	(Trigonometric form)		
Week 10	3	Ability to solve Fourier series with te knowledge of even and odd function, Half Wave Symmetry.	Fourier Series (even and odd function , Half Wave Symmetry)	Lecture	Quiz,Assignment, Exam
Week 11	3	Ability to knowledge Line Spectrum (harmonic) the Fourier Series and draw them	Line Spectrum (harmonic) the Fourier Series	Lecture	Quiz,Assignment, Exam
Week 12	3	Ability to solve Complex Exponential form of the Fourier Series with the knowledge of their properties	Complex Exponential form of the Fourier Series,	Lecture	Quiz,Assignment, Exam
Week 13	3	Ability to understand ve Vectors: (definition, notation, with knowledge of their properties	Introduction to Vectors: (definition, notation, properties)	Lecture	Quiz,Assignment, Exam
Week 14	3	Ability to solve Vector algebra by using addition, subtraction, multiplications	Introduction to Vectors: (Vector algebra: addition, subtraction, multiplications)	Lecture	Quiz,Assignment, Exam
Week 15	3	Ability to solve Vector functions as lines, planes, fields, Eigen vector and Eigen values to Increasing the student's knowledge of	Vector functions: lines, planes, fields, Eigen vector and Eigen values	Lecture	Quiz,Assignment, Exam

		vectors and its application			

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	
12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	[1] G. B. Thomas, E. Transcendentals, M. D. Weir, J. Hass, and C. *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

1. Course Name:
Electronic Circuits
2. Course Code:
ELCI202
3. Semester/Year:
First Semester /Second level
4. Description Preparation Date:
27/3/2024
5. Available Attendance Forms:
Face to face
6. Number of Credit Hours(Total)/Number of Units(Total)
75 hours / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Rabee M. Hagem Email: rabeehagem@uomosul.edu.iq

8. Course Objectives

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.

9. Teaching and Learning Strategies

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

10. Course Structure

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	Theoretical and practical test with written and oral quizzes

				completing the lecture	
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 circuits	DC response, Transistor biasing and Transistor biasing examples	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
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	Theoretical and practical

				face through an interactive presentation of the subject with doing practical experiment after completing the lecture	test with written and oral quizzes
8	5	FET and MOSFET transistors	Introduction to 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
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	Theoretical and practical test with written and oral quizzes

				completing the lecture	
12	5	OP applications 1	OP applications 1	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
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

11.Course Evaluation

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

Quizzes and participation 10%
Reports and labs 10%
Practical teat 10%
Pre-final test 20%

Final theoretical and practical test 50%	
12.Learning and Teaching Resources	
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

13. Course Name:	
Data Structures	
14. Course Code:	
DAST203	
15. Semester/Year:	
First-semester / Second year	
16. Description Preparation Date:	
28/3/2024	
17. Available Attendance Forms:	
In class	
18. Number of Credit Hours(Total)/Number of Units(Total)	
60/3	
19. Course administrator's name (mention all, if more than one name)	
Name: Ass. Prof. Dr. Turkan Ahmed Khaleel Email: turkan@uomosul.edu.iq	
20. Course Objectives	
Course Objectives	• The module aims to introduce students to a wide vari of data structures and algorithms. It provides stude with a coherent knowledge of techniques implementing data structures and algorithms. It a discusses the complexity, advantages, and disadvanta of different data structures and algorithms. Finally introduces the main algorithms for fundamental ta such as sorting and searching.
21. 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 analy 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	4	Examine abstract data types, concrete data structures, and algorithms.	Introduction and review, information hiding, Encapsulation, Design, and implementation of list ADTS using arrays and linked lists.	Lecture	Oral exam
Week 2	4	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	4	Specify abstract data types and algorithms in a formal notation.	Stacks Stack ADT, implementation using arrays.	Lecture	Oral exam Home work
Week 4	4	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	4	Specify abstract data types and algorithms in a formal notation.	Queues: Queue ADT, implementation using arrays.	Lecture	Oral exam Home work

Week 6	4	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	4	Implement complex data structures and algorithms.	Trees: Introduction, Terminology, Traversals, Applications: Binary Trees, Tree	Lecture	Quiz
Week 8	4	Implement complex data structures and algorithms.	Trees: Applications: Binary Trees, Tree		Exam
Week 9	4	Implement complex data structures and algorithms.	Introduction to Graph Theory.	Lecture	Quiz Oral exam Homework
Week 10	4	Implement complex data structures and algorithms.	Hashing Techniques	Lecture &Lab	Quiz Oral exam Home work
Week 11	4	Implement complex data structures and algorithms.	Sorting techniques and Searching techniques	Lecture &Lab	Oral exam Home work
Week 12	4	Implement complex data structures and algorithms.	Complexity Analysis	Lecture &Lab	Quiz
Week 13	4	Assess the effectiveness of data structures and algorithms.	Presentation on coursework if it is necessary	Lecture	Presentation

Week 14	4	Assess the effectiveness of data structures and algorithms.	Students support	Lecture &Lab	Exam
Week 15	4		Study week and preparations for assignment submission and Exams		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: 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

22. Course Name:
Micro-Processor I
23. Course Code:

MIPR250	
24. Semester/Year:	
First semester/Second year	
25. Description Preparation Date:	
31/3/2024	
26. Available Attendance Forms:	
In class / on meet	
27. Number of Credit Hours (Total)/Number of Units(Total)	
60/3	
28. Course administrator's name (mention all, if more than one name)	
Name: Dr. Mazin Hashim Aziz Email: mazin.haziz@uomosul.edu.iq	
29. Course Objectives	
Course Objectives	• Provide students with a solid understanding of the 8086 architecture, instruction set, machine code, assembly coding, debugging techniques, and the use of INT services. • Writing and developing mini tasks using assembly language via experimental.
30. 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.
31. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	4	An ability to acquire and apply new knowledge about the microprocessor's history and advances.	Introduction to Microprocessors.	Lecture	Oral Discussion
2	4	An ability to describe and discuss the 8086-microprocessor architecture and buses.	The Architecture and Buses of the 8086 Microprocessor.	Lecture & Lab	Oral Discussion Homework #1 Lab Report #1
3	4	An ability to describe and apply memory and input/output addressing modes.	The 8086 Microprocessor's Addressing modes	Lecture & Lab	Quiz #1 Homework #2 Lab Report #2
4	4	Learning the basics of the microprocessor	The 8086 Microprocessor	Lecture & Lab	Homework #3 Lab Report #3

		instructions and the useful tools for applying them.	Instruction set, Debug, and MASM software		
5	4	Learning and applying the data transfer instructions.	The Data-Transfer instructions' group	Lecture & Lab	Quiz #2 Lab Report #4
6	4	Learning and applying the logical and shift & rotate instructions.	The Logical and Shift & Rotate instructions' group	Lecture & Lab	Homework #4 Lab Report #5
7	4	Learning and applying the branching instructions.	The Loop and Branching instructions' group	Lecture & Lab	Quiz #3 Lab Report #6
8	4	Learning and applying the arithmetic instructions.	The Arithmetic instructions' group	Lecture & Lab	Quiz #4 Homework #5
9	4		Evaluation Term Exam.	Theory & Lab	Term Exam.
10	4	Learning and applying the string instructions.	The String instructions' group	Lecture & Lab	Homework #6 Lab Report #7

11	4	Learning and applying the logical control instructions.	The Control instructions' group	Lecture & Lab	Quiz #5 Lab Report #8
12	4	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	Homework #7 Lab Report #9
13	4	Understand and apply the use of the BIOS and DOS services.	The BIOS and DOS Interrupts	Lecture & Lab	Homework #8 Lab Report #10
14	4	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	Quiz #6
15	4		Final Exam	Theory & Lab	Final Exam
32. Course Evaluation					

6-quizzes	3pts
8-homework	2pts
10-Lab reports	5pts
Lab Term Exam	10pts
Theory Term Exam	30pts
Lab Final Exam	10pts
Theory Final Exam	40pts
Total	100pts

3. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Walter Triebel and Avtar Singh, The 8088 and 8086 Microprocessors programming, Interfacing, software, Hardware, Applications, 4th edit 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, website	https://classroom.google.com/c/NjIzNTc5NzkwMzU5 https://www.eng.auburn.edu/~sylee/ee2220/8086_instruction_set.html

Course Description Form

1. Course Name:
Programmable Logic Design
2. Course Code:
PLDE205
3. Semester/Year:
1st semester/2nd 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)
30/2
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 instruct the students the basic concepts of of very high-speed circuit hardware programmable logic design and the us description language.

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
Week 1	2	Understanding Programmable Logic Devices	Introduction to Programmable Logic Devices	Lecture, Lab, Tutorial	Quiz, Assignment, Exam
Week 2	2	Understanding grammable Logic Devices	Taxonomy of Programmable Logic Devices Technologies	Lecture, Lab, Tutorial	Quiz,Assignment, Exam

Week 3	2	elop a solid erstanding of PLD devices	Implementing Logic Functions using PLDs	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 4-5	2	elop a solid erstanding of PLD devices	sic principles of Programmable gital devices PAL, PLA, CPLD review	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 6-7	2	erstand the ard in nbinational logic circuits	azards in Combinational Logic Circuits	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 8	2	elop a solid erstanding of FPGA devices	FPGA structure	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 9-10	2	dy concepts of VHDL	VHDL Language	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
eek 11-12	2	dy concepts of VHDL	Circuit Design in VHDL	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 13	2	dy concepts of VHDL	Code structure of VHDL	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 14	2	dy sequential ncepts of VHDL	Sequential statement of VHDL	Lecture, Lab, Tutorial	Quiz,Assignment, Exam
Week 15	2	dy state machine ncepts of VHDL	State machine of VHDL	Lecture, Lab, Tutorial	Quiz,Assignment, Exam

11. Course Evaluation

Quizzes, Online Assignments, Onsite Assignments, Projects/Lab, Reports, Midterm Exam, Final Exam.

12. Learning and Teaching Resources

Required textbooks(curricular books, if any)	Modern digital design by Richard S. Sandige 1990. Voinci A. pedroni, "Circuit design with VHDL", MIT press, Cambridge, London 2004.
Main references (sources)	

Recommended books and references (scientific journals, reports)	Thom A.S. "digital with CPLA application and VHDL. Brain Hold : "digital logic Design", 4th Edition, Newmans, 2002.
Electronic references, websites	

Course Description Form

1. Course Name:
Numerical Analysis
2. Course Code:
ENGE220
3. Semester/Year:
Second semester / Second year
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
physical attendance in class
6. Number of Credit Hours(Total)/Number of Units(Total)
75/3
7. Course administrator's name (mention all, if more than one name)
Name: Akram Abdul Mawjood Dawood , Dr. amar Idrees daood Email: akram.dawood@uomosul.edu.iq , amar.daood@uomosul.edu.iq
8. Course Objectives

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

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	2hr	Understand and analyze dataset.	Introduction to Data Analysis	Lecture	Oral exam
Week2	2hr	Learn all basic mathematical of statistics and probability.	Descriptive Statistics, Mea of central tendency (mean, median, mode), Measures dispersion (variance, standa deviation, range)	Lecture	Home work
Week3	2hr	Compute statistics measurements to conclude the distribution of the collected data	Data visualization techniqu (histograms, box plots, scatter plots)	Lecture	Oral exam
Week4	2hr	Perform conducting predication analysis which can be applied into data mining.	Probability Th Fundamentals of probabilit	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.	Conditional probability, Ba rules for Data Mining Machine Learning	Lecture	Quiz Oral exam Home work
Week6	2hr	Probability basics	Discrete and continuous probability distributions (binomial, normal, expone	Lecture	Quiz

Week7	2hr	Probability calculations	Probability density and cumulative distrib functions	Lecture	Home work
Week8	2hr	List theories and concepts used in Numerical Analysis.	Introduction to Numerical Methods for Data and error Analysis	Lecture	Oral exam
Week9	2hr	Classifying the numerical techniques to compute approximate solutions of linear and nonlinear equations and differential equations.	Numerical Methods for lin Data Analysis	Lecture	Home work
Week10	2hr	compute solutions of nonlinear equations	Numerical Methods for non- linear Data Analysis	Lecture	Quiz
Week11	2hr	Apply numerical techniques for interpolation.	Interpolation and extrapola	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				

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. will be according the following table:-

As	Time/Number	Weight (Marks)

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

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

1. Course Name:
Engineering Management
2. Course Code:
CE209
3. Semester/Year:
4. Description Preparation Date:
29/3/2024
5. Available Attendance Forms:

Face to face
6. Number of Credit Hours(Total)/Number of Units(Total)
2/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Farah Nazar Ibraheem Email:farah_nazar80@uomosul.edu.iq Name :Shaymaa Nazar Hussain Email :

8. Course Objectives	
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

9. Teaching and Learning Strategies	
Strategy	Activating lessons and making them interactive: This includes using interac 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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understanding Definitions and Terms, Knowledge Organizational Structures	Administration organization (definitions terms, organizat and organizational structures, committees, correspondences 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-making and its importance in engineering management systems. •Explain the stages involved in decision-making processes.	Methods and stages of decision-making	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing Opportunities to ask questions and communicate with	Theoretical exam With Daily exams Written and oral

				the lecturer or colleagues	
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,stimulating 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 management. • Explain the importance of scheduling and time management in achieving project objectives	Project Time Planning (Critical Path Method CPM)	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
5	2	Explain how Data visualization, including bar charts, contributes effective decision-making in engineering management contexts	- bar charts	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and	Theoretical exam With Daily exams Written and oral

				providing Opportunities to ask questions and communicate with the lecturer or colleagues	
6	2	Identify the role of data visualization facilitating decision-making processes in engineering management.	sagittal 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
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	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

		in engineering projects.			
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 costs , and quality	Types of project control (time, costs, quality)	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
10	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.	Methods for choosing a project site and managing the work site	Use presentations to simplify difficult concepts and Encourage interaction By adding guiding questions,stimulating discussions and providing Opportunities to ask	Theoretical exam With Daily exams Written and oral

		Explain the significance of considering site selection criteria in planning phase of a project to ensure feasibility, sustainability, and succe		questions and communicate with the lecturer or colleagues	
11	2	• Describe different types of contracts used in engineering projects, such as fixed-price contracts, cost-reimbursable contracts, time and materials contracts, and hybrid contracts. • Understand the advantages, disadvantages, and suitability of each contract type for different project scenarios and risk profiles.	Contracting, its types and project Assignment methods	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
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 significance in engineering projects and operations. • Explain key quality management principles, such as customer focus, continuous improvement, and process approach.	Quality management quality control	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
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	

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

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

Course Description Form

1. Course Name:
Engineering Mathematics II
2. Course Code:
ENGE230
3. Semester/Year:
Second semester / second year
4. Description Preparation Date:
4/4/2024
5. Available Attendance Forms:
In class / on meet
6. Number of Credit Hours(Total)/Number of Units(Total)
45 hr./ 3 unit
7. Course administrator's name (mention all, if more than one name)

Name: Warqaa Younis Ibraheem Email: warqaa.younis@uomosul.edu.iq

Name: Jumana Abdullah kareem Email: jumana.abdullah@uomosul.edu.iq

8. Course Objectives

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. • To make aware students of the importance symbiosis between Mathematics and Engineering

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 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	3	Ability to solve Laplace transform problems with knowledge of their properties	Introduction to Laplace transform properties and state application	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 2	3	Ability to solve Laplace transform	Laplace transform table	Lecture, Tutorial,	Quiz,Assignment, Exam

		problems by using Laplace table			
Week 3	3	Ability to solve Laplace transform 1st shift and 2nd shift problems with knowledge of their properties	1st Shifting theorem (Translation in S-domain) 2nd Shifting theorem (Translation in Time) Convolution Theorem	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 4	3	Ability to solve Laplace transform with unit step function problems	Unit step function, Initial and final value theorems.	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 5	3	Ability to solve Inverse Laplace transform problems	InverseLaplace Transform.	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 6	3	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 Equations byLaplace Transformation, and Applications of LT	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 7	3	Solve the linear and non-linear differential equations 1st order and 2nd order equations, and choose appropriate procedures to solve them	Definition and Classification of differential equation DE (ordinary and partial, order, degree, Linear and non-linear).	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 8	3	Ability to Solve the 1st order and 2nd order	Solutions of differential equations (general	Lecture, Tutorial,	Quiz,Assignment, Exam

		equations, and choose appropriate procedures to solve them	and particular solutions)		
Week 9	3	Ability to solve 1st ode by different methods.	1st order ordinary DEs (Linear, separable homogeneous)	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 10	3	Ability to solve 1st ode by different methods.	1st order ordinary DEs (Exact, not Exact, and Nonhomogeneous)	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 11	3	Ability to Solve the IVP and boundary value problem	Mid Term Exam and Initial value problems, Boundary values problems of 2nd ODEs.,	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 12	3	Ability to Solve 2nd ode Linear and nonlinear	2nd order ordinary DEs(Linear 2nd order des with constant coefficients,	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 13	3	Solve functions With undetermined coefficients	Undetermined Coefficients method,	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 14	3	Ability to solve 2nd ode by variation of parameters and systems then discussion.	2nd order DEs with Variable of parameter method, variable coefficients and team works	Lecture, Tutorial,	Quiz,Assignment, Exam
Week 15		All	Final Exam		Exam

11.Course Evaluation

Quizzes 15%, Online Assignments 12%, Onsite Assignments 7%, Reports(team works) 6%, Midterm Exam 10%, Final Exam 50%.

12.Learning and Teaching Resources

Required textbooks(curricular books, if any)	G. B. Thomas, E. Transcendentals, M. D. Weir, J. Hass, and C. Heil, "Calculus", 13th edition. 2014.
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

1. Course Name	
Digital Electronics	
2. Course Code	
CO210	
3. Semester/Year	
2nd semester / 2nd year	
4. Description Preparation Date	
28-3-2024	
5. Available Attendance Forms	
in class ,on meet	
6. Number of Credit Hours(Total)/Number of Units(Total)	
75/4	
7. Course administrator's name (mention all, if more than one name)	
Name: modhar ahmed hammoudy hussain Email: modharhammoudy@uomosul.edu.iq	
8. Course Objectives	
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.
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 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.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	5	Monitoring the figure of merit of the logic gates types	Introduction to digital electronics and the digital IC characteristics	lecture	oral exam
Week 2	5	Naming all the Families (Types) of digital electronics circuits and the different between them	Resistor diode logic RDL	lecture	Home work
Week 3	5	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	5	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	5	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	5	determine the power consumption, number of load circuits and the	Emitter coupled logic ECL , I2L	Lecture &lab	Lab report

		logic voltage levels for the logic gate			
Week 7	5	Naming all the Families (Types) of digital electronics circuits	The Field effect transistror FET	Lecture &lab	Lab report
Week 8	5	determine the logic voltage levels for the logic gate	MOSFET logic circuits design and analysis	Lecture &lab	Home work
Week 9	5	Naming the different between the digital electronics circuits	NMOS and PMOS logic circuits	Lecture &lab	Quiz
Week 10	5	determine the logic voltage levels for the logic gate	Complementary Metal Oxide CMOS logic circuits	Lecture	Oral exam
Week 11	5		mid exam		Exam
Week 12	5	Select the suitable logic design after summarizing the different types of logic gates families	Sequential MOS logic circuits	Lecture &lab	Lab report
Week 13	5	Ability of deconstruct any digital logic circuit to evaluate the electrical and logical magnitudes	Regenerative logic circuits	Lecture	oral exam
Week 14	5	Designing a new digital logic circuit to perform a certain duty	Semiconductor memories	Lecture	oral exam
Week 15	5		Final exam		Exam

11. Course Evaluation

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%

12. Learning and Teaching Resources

Required textbooks(curricular books, if any)	"Digital Integrated Circuits Analysis and Design" by: John E. Ayers.2004
Main references (sources)	"Analysis and Design of Digital Integrated Circuits" by: David A. Hodges. 1
Recommended books and references (scientific journals, reports)	
Electronic references, websites	Lab Manual , LTSPICE Design Tool

Course Description Form

1. Course Name:	
Microprocessor II	
2. Course Code:	
MIPR252	
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)	
60/3	
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	• Providing students with a solid understanding of methods for designing and representing microprocessor and memory interface circuits as well as input and output ports.

	• Inform students about successive generations of microprocessors and the improvements added by each generation. • Teach students the basics of the different operating modes of most generations of microprocessors. • Teaching students the nature of arithmetic coprocessors, their structure, and their instructions in a brief manner. • Enabling students to prepare designs for interfacing circuits and apply those designs using specialized simulation suits.

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	4	An ability to acquire and apply new knowledge about the microprocessor's address decoding principles and design.	The 8086 Microprocessor's address decoding.	Lecture	Oral Discussion
2	4	An ability to acquire and apply new knowledge about the	The 8086 Microprocessor's memory interface.	Lecture & Lab	Oral Discussion Homework #1 Lab Report #1

		memory interface basics and design.			
3	4	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	Quiz #1 Homework #2 Lab Report #2
4	4	Learning the basics of the 8x86 microprocessors register development.	The 8X86 Registers (16, 32, and 64-bits).	Lecture & Lab	Homework #3 Lab Report #3
5	4	Learning the basics of the protected mode and other microprocessor operating modes.	Introduction to Protected Mode.	Lecture & Lab	Quiz #2 Lab Report #4
6	4	Learning the principles of memory segmentation and paging.	Memory segmentation and paging.	Lecture & Lab	Homework #4 Lab Report #5
7	4	Learning the basics of math coprocessors.	Math Co-processor: Introduction.	Lecture & Lab	Quiz #3 Lab Report #6
8	4	Learning and applying the math coprocessor different data formats.	Math Co-processor: Data Formats.	Lecture & Lab	Quiz #4 Homework #5

9	4	Learning the math coprocessor architecture.	Math Co-processor: 80x87 Architecture.	Lecture & Lab	Homework #6 Lab Report #7
10	4		Evaluation Term Exam.	Theory & Lab	Term Exam.
11	4	Learning the math coprocessor instruction set.	Math Co-processor: Instruction Set.	Lecture & Lab	Quiz #5 Lab Report #8
12	4	Learning an introduction to the MMX technology.	MMX Technologies.	Lecture & Lab	Homework #7 Lab Report #9
13	4	Understand the advances in 8x86 microprocessor's architectures.	Introduction to 8X86 Microprocessors' architectures (1).	Lecture & Lab	Homework #8 Lab Report #10
14	4	Analyze the differences between 8x86 microprocessor's architectures.	Introduction to 8X86 Microprocessors' architectures (2).	Lecture & Lab	Quiz #6
15	4		Final Exam	Theory & Lab	Final Exam

11. Course Evaluation

6-quizzes	3pts
8-homework	2pts
10-Lab reports	5pts
Lab Term Exam	10pts
Theory Term Exam	30pts
Lab Final Exam	10pts

Theory Final Exam	40pts
Total	100pts
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Walter Triebel and Avtar Singh, The 8088 and 8086 Microprocessors: programming, Interfacing, software, Hardware, Applications, 4th edition, prentice-Hall, 2002.
Main references (sources)	Lectures, experiment manual, and notes
Recommended books and references (scientific journals, reports)	The Intel microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-bit extensions: architecture, programming, and interfacing by: Barry B. Brey—8th ed.
Electronic references, websites	https://classroom.google.com/c/NTM5Mjg0MDE5NTY1

Course Description Form

1. Course Name:
Magnetic and Energy Conversion
2. Course Code:
MECO257
3. Semester / Year:
First semester / Second year
4. Description Preparation Date:
31/3/2024
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	Explaining the principles of magnetism and how to benefit from them, the electric motor and electrical transformers, electromagnetic waves and their characteristics, antennas and their characteristics, types and applications. • The ability to distinguish, identify and define renewable and non-renewable energy sources • Compare the differences between renewable and non-renewable energy sources. • Analyze and identify methods of energy sources and how solar cells work. • The ability to design a renewable energy system that meets desired needs within given constraints by applying both analysis and synthesis in the design process. • Measure and calculate the energy and energy needed for the site.

9. Teaching and Learning Strategies

Strategy	Magnetism and energy conversion will be covered for this chapter. Teaching and teaching strategies focus on Develop communication between the teacher and students to give them more opportunities to express their ideas and opinions. The

	course includes Activities and exercises guide students to strengthen their skills in solving the energy crisis. Students also learn how to manage And solve energy problems using the correct rules. Efforts will be directed towards teaching students how to think about what beyond common classroom tasks and awaken their desire to excel in the subject.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Analysis of the principles of electronic circuits and transformers	The principles, circuits and applications of (AC-AC, AC-DC, DC-AC, DC-DC) materials.	Class lecture	Oral examination
Week 2	2	Learn the principles and analysis of magnetic fields and their practical applications	Principal of magnetic field and its applications for engineers.	Class lecture	Sudden test
Week 3	2	Analyzing the differences between motors, generators, and transformers, while studying their	Electric motors, generators and transformers (principals, types and their applications).	Class lecture	Oral exam and homework

		different types and shapes			
Week 4	2	Analyze and understand the properties and data of magnetic fields	Electromagnetic waves (concept and their characteristics).	Class lecture	oral test
Week 5	2	Understanding the operation of transmitters and analyzing their characteristics	Antennas (concept and characteristics).	Class lecture	Sudden test
Week 6	2	Understanding the types of transmitters and knowing their applications	Types of antennas and their applications in telecommunication networks.	Class lecture	Homework
Week 7	2	a test	E1	Class test	Initial written examination
Week 8	2	Analyze and know what renewable energy is	Introduction to solar power energy	Class lecture	oral test

Week 9	2	Analysis of renewable energy sources	Overview of the major source of energy	Class lecture	Sudden test
Week 10	2	Understand and analyze the operation of the photocell	How solar Panel convert light into electricity	Class lecture	Homework
Week 11	2	Analysis and calculation of renewable energy efficiency	Calculating Energy Efficiency	Class lecture	oral test
Week 12	2	Knowledge of the components and characteristics of power generation networks	Electrical and Mechanical components of a solar panel system	Class lecture	Sudden test
Week 13	2	Knowledge and understanding of wind energy principles	Introduction to wind power energy and fundamentals	Class lecture	Homework
Week 14	2	a test	E2	Class test	With a second written test

Week 15	2	project	P.P Presentation	Submit and present a project	Presenting a project to students

11. Course Evaluation:	
Daily exam	5
Daily duty	5
Presentation and presentation of a project	10
Written exam 1	10
Written exam 2	10
A theoretical final exam	60
the total	100

Required Textbooks:

Main reference : Lectures with notes provided by the teacher

- Recommended Textbooks: Introduction to Renewable Energy by Vaughn C. Nelson CRC Press, 2015, ISBN: 9781498701952.
- Renewable Energy: An Essential Guide (Essential Guides) by Mark Boxall, March 2, 2019, ASIN : B07PCL4Q5H

https://rengj.mosuljournals.com/

- Electronic Reference/ Website: https://one-solar.net/product/solar-panel-inverter.html
- https://www.e-education.psu.edu/earth104/node/913?authuser=0
- https://center4ee.org/how-solar-energy-works/?authuser=0
- https://www.youtube.com/watch?v=xKxrkht7CpY

Course Description Form

1. Course Name:
Discrete Mathematics
2. Course Code:
DIMA256
3. Semester/Year:
Second/Second level
4. Description Preparation Date:
27/3/2024
5. Available Attendance Forms:
In Class / On Meet
6. Number of Credit Hours(Total)/Number of Units(Total)
30 hours and 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Nada Ismail Najim, Dr. Ula Tariq Email: nada.ismail@uomosul.edu.iq , ula.tariq@uomosul.edu.iq
8. Course Objectives

Course Objectives	• The student learns about logic and logical equivalences. • Students learn about sets and their equivalence, their strength. • The student will be familiar with theories and proofs. • Know how to solve problems • Knowing the types of relationships • Knowing the applications and modeling of Discrete mathematics.

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

10. Course Structure

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

1	2	Propositional logic, Logical connectives.	Propositional logic, Logical connectives.	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
2	2	Truth tables, Normal forms (conjunctive and disjunctive).	Truth tables, Normal forms (conjunctive and disjunctive).	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
3	2	Validity, Predicate logic,	Validity, Predicate logic,	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
4	2	Universal and existential quantification	Universal and existential quantification	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
5	2	Logical Quantifiers negation. Priority and Precedence. Tautologies, Contradictions, and contingencies.	Logical Quantifiers negation. Priority and Precedence. Tautologies, Contradictions, and contingencies.	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
6	2	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
7	2	Sets (Venn diagrams, complements, Cartesian products, power sets)	Sets (Venn diagrams, complements, Cartesian products, power sets)	Explain the main concepts face to face through an	Theoretical and practical test with

				interactive presentation of the subject	written and oral quizzes
8	2	Set Operations. Cardinal Numbers and Surveys. Infinite Sets and Their Cardinalities	Set Operations. Cardinal Numbers and Surveys. Infinite Sets and Their Cardinalities	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
9	2	Functions (surjections, injections, inverses, composition)	Functions (surjections, injections, inverses, composition)	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
10	2	Graphing Function , Ceiling and Floor	Graphing Function , Ceiling and Floor	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
11	2	Relations (reflexivity, symmetry, transitivity, equivalence relations)	Relations (reflexivity, symmetry, transitivity, equivalence relations)	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
12	2	Arithmetic of Matrix (Range, Transposes and Power and Zero One Matrix),	Arithmetic of Matrix (Range, Transposes and Power and Zero One Matrix),	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
13	2	Sequences and Strings	Sequences and Strings	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes

14	2	Discussion about some applications of discrete mathematics and its usefulness in computer engineering	Discussion about some applications of discrete mathematics and its usefulness in computer engineering	Explain the main concepts face to face through an interactive presentation of the subject	Theoretical and practical test with written and oral quizzes
15	2	Review the main concepts before the final test	Review the main concepts before the final test	Review the main concepts before the final test	Theoretical and practical test with written and oral quizzes

11.Course Evaluation

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

Quizzes and participation 10%
homework 5%

Pre-final test 25%
Final theoretical and practical test 60%

12.Learning and Teaching Resources

Required textbooks(curricular books, if any)	1. Blitzer, Robert, and Daniel S. Miller. Thinking mathematically. Boston, MA: Prentice Hall, 2011. 2. Epp, Susanna S. Discrete mathematics with applications. Cengage learning, 2010.
Main references (sources)	Rosen, Kenneth H. Discrete mathematics & applications. McGraw-H Eight Edition;
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

13. Course Name:
English Language intermediate level
14. Course Code:
N/A

15. Semester/Year:	
First Semester / Third Grade	
16. Description Preparation Date:	
1-4-2024	
17. Available Attendance Forms:	
In class + Online	
18. Number of Credit Hours(Total)/Number of Units(Total)	
30/2	
19. Course administrator's name (mention all, if more than one name)	
Name: Basman Mahmood Hasan Alhafidh Email: bm.alhafidh@uomosul.edu.iq	
20. Course Objectives	
ourse 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.

21. 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.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Review And learn grammar for the class	UNIT 1: A world of difference Grammar: Simple, continuous, perfect, active and passive. Reading: Saro's story "Lost and found".	In Class Lecture	daily oral
2	2	Learn conversation for class and speaking style	UNIT 1 A world of difference: Speaking: Missing words.	In Class Lecture	Quiz

3	2	Learn the art of listening by analyzing and applying synonyms	UNIT 1 A world of difference!: Listening: Things I miss from home. Vocabulary: Compound words.	In Class Lecture	daily oral and homework
4	2	Learn, analyze, create and present reports	Report submission feedback and instructions how to make a good presentation.	In Class Lecture	homework
5	2	Evaluation and application of 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

23. Course Evaluation	
Quizzes	5
Homework	5
Conversations	10
Report and Presentation	10
Pre–Final Test	10
Final Test	60
Total	100

24. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	
Main references (sources)	SOARS, J. & SOARS, L. 2014. New Headway -Intermediate Fourth Edit 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

1. Course Name:
Computer Networks I and Data Communication
2. Course Code:
CONE302

3. Semester/Year:
First / 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)
45/3
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Salah Abdulghani Email: eng.salah@uomosul.edu.iq
8. Course Objectives

Course Objectives	This course will cover many topics and concepts of computer networks and data communication. The topics that will be covered during this course will include the first layer (physical layer), and the second (data link layer). The topics of data communication includes: network devices and transmission media, data and signal transmission, digital and analog transmission, analog transmission, bandwidth utilization, multiplexing, error detection and correction. The topic of computer networks includes: switching (circuit-switched and packet networks), data link control, multiple access links and protocols. The objective

	of this course is to provide fundamentals of computer networks and data communication.

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	3	Identify and describe the basics of Data Communications	Introduction to Data Communications and Underlying Technologies	Lecture	Quiz
2	3	Identify and describe the OSI Model and the TCP/IP Protocol Suite	The OSI Model and the TCP/IP Protocol Suite	Lecture	Quiz
3 & 4	6	Identify and describe the Data and Signal Transmission	Data and Signal Transmission	Lecture	Home work
5 & 6	6	Identify, describe, explain and compare with various types of analogue and digital transmission	Analogue and Digital Transmission	Lecture	Home work
7 & 8	6	Identify and describe the Bandwidth Utilization, and Multiplexing	Bandwidth Utilization, Multiplexing	Lecture	Quiz
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	Term Exam 1
13 & 14	6	Identify and describe the Multiple Access Links Protocols	Multiple Access Links and Protocols	Lecture	Home work
15	3	Identify and describe the Error Detection and Correction	Error Detection and Correction	Lecture	

11. Course Evaluation

Quizzes	**12% (12)**	**4**

Assignments	**3% (3)**	**3**
Report/Lab	**10% (10)**	**5**
Midterm Exam 1	**25% (25)**	**2 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

25.	Course Name:
DSP	
26.	Course Code:
CO308	
27.	Semester/Year:
Five / Third	
28.	Description Preparation Date:
31/ 3/ 2024	
29.	Available Attendance Forms:
In class/ Meet	
30.	Number of Credit Hours(Total)/Number of Units(Total)
45/ 3	
31.	Course administrator's name (mention all, if more than one name)

Name: zahra talal abed

Email: zahraatalal@uomosul.edu.iq

32. 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.

33. 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 by consider type of simple experiments involving some sampling activities that are interesting to students.

34. 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 theory	Introduction of Z transform	Lecture	Oral t
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 e method of FIR filter design	FIR filter design	Lecture	Quiz
15	1	exam	Exam	Exam	exam

35. 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**
5% (5)	1	**Report**
25% (25)	2 hr	**Midterm Exam**
50% (50)	3 hr	**Final Exam**

36. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	"1- Discrete-Time Signal Processing" 3rd tion, ALAN V. OPPENHEIM and W. HAFER HEWLETT, Prentice-Hall Signal cessing Series, 2010. 2- "Digital Signal Processing", 3rd, Mithra, McGraw Hill Publications, 2008
Recommended books and references (scientific journals, reports)	'Discrete-Time Signal Processing" 3rd Edition, AN V. OPPENHEIM and W. SCHAFER WLETT, Prentice-Hall Signal Processing Series, 0 . 2- "Digital Signal Processing", 3rd, Mithra, McGraw Hill Publications, 2008
Electronic references, websites	

Course Description Form

37. Course Name:
Computer Architecture I
38. Course Code:
COAR305
39. Semester/Year:
Semester 1 / 2023-2024
40. Description Preparation Date:
27 / 3 / 2024
41. Available Attendance Forms:
1. Classroom 2. Google Classroom (55tl2mf)
42. Number of Credit Hours(Total)/Number of Units(Total)
125 Hour / 5 Units
43. 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

44. 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 organizatic and design of digital computer. • Shows the necessary steps that a designer must go through to design an elementary basic computer.

45. Teaching and Learning Strategies

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

46. 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		Basic Computer hardware design: Instruction codes and registers	Lecture	Discussions

9	3	Understanding: Interpret the types of instructions of a basic computer.	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

47. Course Evaluation

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

48. 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

49. Course Name:	
Computer Interface	
50. Course Code:	
COIN306	
51. Semester/Year:	
Five / Third	
52. Description Preparation Date:	
8/ 4/ 2024	
53. Available Attendance Forms:	
In class/ Meet	
54. Number of Credit Hours(Total)/Number of Units(Total)	
60/ 2	
55. Course administrator's name (mention all, if more than one name)	
Name: Dr. Ina'am Fathi Khudher Email: inam.fathi@uomosul.edu.iq	
56. 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.
57. 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 by consider

	type of simple experiments involving some sampling activities that are interesting to students.

58. 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 8259 (part2)	Lecture+Lab	

14	2	Exam	Theoretical Midterm Exam	Exam	
15	2	Seminar	Presentation.	Seminar	

59. 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)

60. 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

61. Course Name: Operating System I

62. Course Code: CO305

63. Semester/Year: Five 2023-2024

64. Description Preparation Date: 28-3-2024

65. 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.

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

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

Name:Dr.Sura Ramzi Shareef

Email:sura.ramzishareef@uomosul.edu.iq

68. Course Objectives

Course Objectives	• Exploring the importance of operati systems, their goals and functions. • Introduction to designing implementing operating systems. • Covers the various techniques used by operating system to manage resources. • Introducing the student to the concepts structure of various operating syste

	how they work internally, and their n important main parts. • Teaching the student the concept of program, methods of scheduling it on central processing unit, and how implement it using many diffe algorithms. How to manage the cluste of processes (processes, threads, C scheduling, synchronization, and learn about the concept of deadlock). And w to solve the problem of system stagna and try to prevent or avoid it.

69. Teaching and Learning Strategies

Strategy	The main strategy in this course is to: Encouraging students' participation in exercises, as well as impro and expanding their critical thinking skills. Through familiarity with workings of the system, the purpose of its use, and cases of comp system downtime and dealing with them if they occur. This will achieved through classrooms, interactive educational programs, an considering the type of simple experiments that include some samp activities that are of interest to students.

70. 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 of hardware compone and software used operating syste types of systems, t origin development, types of mod systems..	8	2-1

exams, homewo reports+ Discuss ion	Lectures	Operating-System Services Chapter 2	Learn about structure of operating system, h it works, and its m important ba components.	8	4-3
exams, homewo reports+ Discuss ion	Lectures	Processes Chapter 3	Learn about the concept of the program How to schedule it through the system the central processi unit Implementation an types of programs alike Whether it is a system-specific program Belongs to the use	4	5
exams, homewo reports+ Discuss ion	Lectures	Threads & Concurrency Chapter 4	Basic principles concepts of proc management operating syste including proc creation, scheduli synchronization, communication,,	8	7-6
exams, homewo reports+ Discuss ion	Lectures	CPU Scheduling Chapter 5	Learn about concept of program and meth of scheduling through the system the central process unit and how implement it us many dive algorithms.	4	8
exams, homewo reports+ Discuss ion	Lectures	Synchronization Tools Chapter 6	Analyze examp of synchronizat problems operating syste such as produ consumer, read writers, and f philosophers,	8	10-9

			propose soluti using appropri synchronization techniques.		
exams, homewo reports+ Discuss ion	Lectures	Synchronization Examples Chapter 7	The problem of th section is critical, sync devices, Signals, classic problems Of synchronicity.	8	12-11
exams, homewo reports+ Discuss ion	Lectures	Deadlocks Chapter 8	Identify the concep stagnation and w to solve the probl of system stagnat and try to prevent i avoid its occurrenc	8	14-1
Exam		Final exam		3	15

71. 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)

72. Learning and Teaching Resources

Required textbooks(curricular books, if any)	1. Operating Systems Concepts, 1(Edition Silberschatz, Abraham, Ga

	Peter B., and Gagne, G JohnWiley&Sons.,Inc. IS 9781119320913.
Main references (sources)	1. Operating Systems Concepts, 1 Edition Silberschatz, Abraham, Ga Peter B., and Gagne, G JohnWiley&Sons.,Inc. IS 9781119320913. 2. An Introduction to GCC: For the G Compilers GCC and G++, Brian J. Gou Richard M. Stallman, Network Theory 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

73. Course Name:
Soft computing

74. Course Code:
SOCO311
75. Semester / Year:
First semester / third year
76. Description Preparation Date:
31/3/2024
77. Available Attendance Forms:
Attend
78. Number of Credit Hours (Total) / Number of Units (Total):
3/75
79. 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

80. Course Objectives	
Course Objectives	• Finding reasonable solutions for real-world problems whose specific mathematical model is unknown. • Applying modern algorithms that mimics the behavior of organisms. • Integrating human intelligence with electronic devices to produce intelligent systems. • Learn how to build intelligent systems that facilitate the process of classification and identification of different objects.

81. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage studer 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 sim experiments involving some sampling activities that are interesting to the students.

82. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understanding basic concepts	Introduction to soft computing	Lecture	Discussion

2	2	Know what is an artificial neural network	Introduction to artificial neural networks	Lecture	Oral exam
3	2	Understanding the construction of the artificial neuron	Training a perceptron	Lecture	Discussion
4	2	Studying a training algorithm	Training neural networks	Lecture	Homework
5	2		Exam or tutorial	Lecture	Homework
6	2	Understanding the basics of fuzzy logic	Introduction to Fuzzy logic	Lecture	Homework
7	2	Studying an operation of fuzzy logic	Fuzzy sets and fuzzy operations	Lecture	Discussion
8	2	Studying an operation of fuzzy logic	Fuzzification and defuzzification	Lecture	Homework
9	2	Studying an operation of fuzzy logic	Designing a fuzzy control system	Lecture	Homework
10	2		Exam or tutorial	Exam	Quiz
11	2	Understanding the basics of evolutionary computations	Introduction to evolutionary algorithms and genetic algorithm	Lecture	Homework
12	2	Studying an operation of genetic algorithm	Selection and fitness function	Lecture	Homework
13	2	Studying an operation of genetic algorithm	Mutation and crossover	Lecture	Oral exam
14	2	Analysis of a specific engineering problem	Case study of genetic algorithm	Lecture	Homework
15	2		Exam or tutorial	Exam	

83. Course Evaluation

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

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

84. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Lecture notes
Main references (sources)	**Principles of Soft Computing** by S.N. Sivanandam
Recommended books and references (scientific journals, reports)	**Soft Computing and its Applications** by Kumar S. Ray
Electronic references, websites	**Principles of Soft Computing** by S.N. Sivanandam

Course Description Form

1. Course Name:
Computer Networks II
2. Course Code:
CONE351
3. Semester/Year:
Second / 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)	
45/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Salah Abdulghani Email: eng.salah@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	This course will cover many topics and concepts of computer networks. The topics that will be covered during this course will include the network, transport, and application layers of the TCP/IP. The main topics in this course discuss the general issues related to the network layer, IPV4 and IPV6, routing protocols unicast and multicast, discuss the general idea and issues behind the transport layer, discuss the two current protocols UDP, and TCP. Discuss general idea and issues behind the application layer and the protocols DHCP, FTP, TFTP, HTTP, TELNET, SMTP, POP, and IMAP
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1&2	6	Identify and describe the basics of wireed networks	Wired LANs	Lecture	Quiz
3	3	Explain and compare with various types of Networks	Connecting LANs, Backbone Networks, and Virtual LANs	Lecture	Quiz
4	3	Identify and describe the Network layer	Introduction to Network Layer	Lecture	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	Home work
7 & 8	6	Identify and describe the Routing Protocols	Routing Fundamentals and Routing Protocols	Lecture	Exam
9	3	Identify and describe Transport Layer	Introduction to Transport La	Lecture	Quiz
10 & 11	6	Identify and describe the Transport Layer protocols	Transport Layer Protocols	Lecture	Home work
12	3	Identify and describe the Application Layer	Introduction to the Application Layer	Lecture	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	Home work
15	3	Identify and describe The DHCP, ICMP, ARP	DHCP, ARP, ICMP	Lecture	

11. Course Evaluation

Quizzes	**12% (12)**	**4**
Assignments	**3% (3)**	**3**
Report/Lab	**10% (10)**	**5**
Midterm Exam	**25% (25)**	**2 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

85. Course Name:	
Database Systems	
86. Course Code:	
DASY359	
87. Semester/Year:	
Second-Semester / Third Year	
88. Description Preparation Date:	
11/4/2024	
89. Available Attendance Forms:	
In class	
90. Number of Credit Hours(Total)/Number of Units(Total)	
60/2	
91. Course administrator's name (mention all, if more than one name)	
Name: Ass. Prof. Dr. Turkan Ahmed Khaleel Email: turkan@uomosul.edu.iq	
92. Course Objectives	
Course Objectives	• Understand the fundamental concepts of databa systems, including data models, database languages, ز • Learn how to design and implement relational database schemas using normalization techniques. • Gain proficiency in SQL (Structured Query Language) for querying and manipulating relational databases.
93. Teaching and Learning Strategies	

Strategy	• Hands-on Projects: Engage students in building databases to reinforce concepts. • Case Studies: Analyze real-world database scenarios to illustrate theory in practice. • Interactive Lectures: Encourage discussions and questions to enhance understanding.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Gain the basic principles of database management systems	Introduction Database Environment. Database Development.	Lecture	Oral exam
Week 2	2	Gain the basic principles of database management systems	Modeling Data in the Organization.	Lecture	Oral exam
Week 3	2	Gain the ability to Draw Entity-Relationship diagrams to represent simple database application scenarios	Logical Database Design and the Relational model, Physical Database Design, and Performance.	Lecture	Oral exam Homework
Week 4	2	Gain the ability to write SQL queries for a given context in a relational	SQL	Lecture	Quiz

		database			
Week 5	2	Gain the ability to write SQL queries for a given context in a relational database	Advanced SQL Getting Started with SQL in Access Beginning SQL Commands in access	Lecture	Oral exam Homework
Week 6	2	Gain the ability to write SQL queries for a given context in a relational database	SQL Joins	Lecture	Quiz
Week 7	2	Gain the ability to write SQL queries for a given context in a relational database	SOL Functions	Lecture	Quiz
Week 8	2	Gain the ability to write SQL queries for a given context in a relational database	SQL Query Development and Derived structures, SQL set Operations		Exam
Week 9	2	Gain the design and development of distributed systems and distributed systems applications.	Client/Server Database Environment	Lecture	Quiz Oral exam Homework
Week 10	2	Gain the design and development of distributed systems and distributed systems applications.	Internet Database Environment, Data Warehousing, Creating and Populating	Lecture	Quiz Oral exam Home work

Week 11	2	Gain the design and development of distributed systems and distributed systems applications.	Data and Database Administration	Lecture	Oral exam Home work
Week 12	2	Gain the design and development of distributed systems and distributed systems applications.	Distributed Database	Lecture	Quiz
Week 13	2	Gain the design and development of distributed systems and distributed systems applications.	Object-Oriented Data ModelingObject-Oriented Database Development	Lecture	Presentation
Week 14	2	Gain the design and development of distributed systems and distributed systems applications.	Students support	Lecture	Exam
Week 15	2		Study week and preparations for assignment submission and Exams		Exam
11. Course Evaluation:					
		Quizzes	2	5% (2.5)	
		Assignments	2	15% (4.5)	
		Project	1	10% (3)	
		Midterm Exam	2 hr	10% (30)	

		Final Exam	3hr	60% (60)	
Required Textbooks: Hoffer, Prescott& McFadden, (2005). " Modern Database Management", (7th ed.) Prentice- Hall, Inc. ISBN: 0-13-145320-3.					
Main reference: Lectures and notes					
Recommended Textbooks: Bagui, S. & Earp, R(2004). "Learning SQL A Step-Step Guide using Access" Addison-Wesley Publishing. ISBN: 0-32-111904-5.					
Electronic Reference/ Website:					

Course Description Form

94. Course Name:
Computer Architecture II
95. Course Code:
COAR353
96. Semester/Year:
Semester 2 / 2023-2024
97. Description Preparation Date:
27 / 3 / 2024
98. Available Attendance Forms:
3. Classroom 4. Google Classroom (jjx3p5i)
99. Number of Credit Hours(Total)/Number of Units(Total)

125 Hour / 5 Units

100. 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

101. Course Objectives

Course Objectives	• Provides the basic knowledge necessary to understar the principle of microprogrammed control unit. • Highlights the central processing unit and the RISC & CISC Characteristics. • Gives the understanding of pipeline concepts and design.

102. Teaching and Learning Strategies

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

103. 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.	Microprogrammed Control: Introduction	Lecture	Discussions
2	3		Microprogrammed Control: Mapping and sequencer	Lecture	Quiz

3	3	Analysis: analyze the basic components of the microprogrammed control unit by writing microprograms.	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
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

104. Course Evaluation

2 quizzes	4pts
2 homework	4pts
2 Term Exam	32pts

Final Exam 60pts Total 100pts	
105. 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

106. Course Name: Operating System II
107. Course Code: CO311
108. Semester/Year: Six 2023-2024
109. Description Preparation Date: 28-3-2024
110. 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.
- ✓ Urging students to follow the material by asking questions directly to each student to show the extent of their interaction with the material and motivating the rest of the students to pay attention.

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

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

Name:Dr.Sura Ramzi Shareef

Email:sura.ramzishareef@uomosul.edu.iq

113. 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 operating systems design implementation, including file systems storage; memory management techniq virtualization and distributed systems.
114. Teaching and Learning Strategies	
Strategy	1. Understand the core principles and concepts of process managemen operating systems, including process creation, scheduling, synchronizat and communication, to effectively manage system resources and facili efficient execution of user programs. 2. Gain knowledge of different memory management techniques, such main memory management and virtual memory, including concepts paging, segmentation, and demand paging, to optimize memory utiliza and support multitasking in operating systems. 3. Explore the structure and functionality of mass storage systems, inclu disk organization, file systems, and I/O systems, to ensure efficient reliable storage and retrieval of data in operating systems. 4. Comprehend the file system interface, implementation, and intern including file organization, directory structures, and access methods, effective management and manipulation of files and directories in opera systems. 5. Develop an understanding of virtual machines and distributed syste including virtualization techniques, distributed file systems, and netw communication protocols, to enable the deployment and managemen

	scalable and reliable computing environments across multiple machines e networks. This course introduces the concepts of the operating system. • It includes: different memory management techniques, such main memory management and virtual memory, pag segmentation, and demand paging, to optimize memory utiliza including concepts like and support multitasking in opera systems and file systems and storage; virtualization and distribu systems. It demonstrates the structure and functionality of mass storage syste including disk organization, file systems, and I/O systems.

115. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
exams, homework, reports+ Discus	Lectures	Overview of Proces Management	Understand the c principles a concepts of proce management operating syste including proce creation, schedul synchronization, a communication, effectively mana system resourc and facilit	4	1

			efficient execution user programs.		
exams, homework, reports+ Discus ion	Lectures	Main Memory	Gain knowledge different mem management techniques, such main mem management	8	2−3
exams, homework, reports+ Discus ion	Lectures	Virtual memory	virtual memo including conce like pagi segmentation, a demand paging, optimize mem utilization a support multitask in operat systems.	8	4-5
exams, homework, reports+ Discus ion	Lectures	Mass−Storage Struactuer	Explore the structure functionality of n storage systems, inclu disk organization, systems, and I/O syste to ensure efficient reliable storage retrieval of data operating systems.	8	6-7
exams, homework, reports+ Discus ion	Lectures	I/O System	Explore structure a functionality of systems, and	8	8-9

			systems, to ensu efficient and relia storage and retrie of data in operat systems.		
exams, homework, reports+ Discus ion	Lectures	File-System Interfac	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.	4	10
exams, homework, reports+ Discus ion	Lectures	File-System Implementation	Comprehend file syst interface, implementation, and interna including organization, directory structur	8	11-12

			and acce methods, effective management a manipulation of fi and directories operating system		
exams, homework, reports+ Discus ion	Lectures	Virtual Machines	Develop understanding virtual machir and distribut systems, includ virtualization techniques, distributed systems, a network communication protocols, to ena the deployment a management scalable a reliable comput environments across multi machines a networks.	8	13-14

Exam		Final exam		3	15

116.

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)

117. Learning and Teaching Resources

Required textbooks(curricular books, if any)	1. Operating Systems Concepts, 1(Edition Silberschatz, Abraham, Galvin, P B., and Gagne, Greg JohnWiley&Sons., ISBN: 9781119320913.
Main references (sources)	1. Operating Systems Concepts, 1(Edition Silberschatz, Abraham, Galvin, P B., and Gagne, Greg JohnWiley&Sons., ISBN: 9781119320913. 2. An Introduction to GCC: For the G Compilers GCC and G++, Brian J. Gou Richard M. Stallman, Network Theory 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 the Inter network

Course Description Form

118. Course Name:	
Embedded Systems	
119. Course Code:	
EMSY358	
120. Semester/Year:	
Sixth / Third Year	
121. Description Preparation Date:	
8/4/2024	
122. Available Attendance Forms:	
In class / on meet	
123. Number of Credit Hours(Total)/Number of Units(Total)	
60/ 2	
124. Course administrator's name (mention all, if more than one name)	
Name: Dr. Ina'am Fathi Khudher Email: inam.fathi@uomosul.edu.iq	
125. 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

126. 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.

127. 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	ATmega2560 6-timer/Counter modes (part1)	Lecture+ Lab.	Quiz

		timers used in embedded systems			
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	

128. 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)

129. 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

130. Course Name:
Database Systems
131. Course Code:
DASY359
132. Semester/Year:
Second-Semester / Third Year
133. Description Preparation Date:
11/4/2024
134. Available Attendance Forms:
In class
135. Number of Credit Hours(Total)/Number of Units(Total)
60/2
136. Course administrator's name (mention all, if more than one name)
Name: Ass. Prof. Dr. Turkan Ahmed Khaleel Email: turkan@uomosul.edu.iq
137. Course Objectives

Course Objectives	• Understand the fundamental concepts of databa systems, including data models, database languages, ز

	• Learn how to design and implement relational database schemas using normalization techniques. • Gain proficiency in SQL (Structured Query Language) for querying and manipulating relational databases.

138. Teaching and Learning Strategies	
Strategy	• Hands-on Projects: Engage students in building databases to reinforce concepts. • Case Studies: Analyze real-world database scenarios to illustrate theory in practice. • Interactive Lectures: Encourage discussions and questions to enhance understanding.

10. Course Structure

Week	Hours	Required Learning Outcomes	**Unit or subject name**	**Learning method**	Evaluation method
Week 1	2	Gain the basic principles of database management systems	Introduction Database Environment. Database Development.	Lecture	Oral exam
Week 2	2	Gain the basic principles of database management systems	Modeling Data in the Organization.	Lecture	Oral exam
Week 3	2	Gain the ability to Draw Entity-Relationship diagrams to represent simple	Logical Database Design and the Relational model, Physical Database Design,	Lecture	Oral exam Homework

		database application scenarios	and Performance.		
Week 4	2	Gain the ability to write SQL queries for a given context in a relational database	SQL	Lecture	Quiz
Week 5	2	Gain the ability to write SQL queries for a given context in a relational database	Advanced SQL Getting Started with SQL in Access Beginning SQL Commands in access	Lecture	Oral exam Homework
Week 6	2	Gain the ability to write SQL queries for a given context in a relational database	SQL Joins	Lecture	Quiz
Week 7	2	Gain the ability to write SQL queries for a given context in a relational database	SOL Functions	Lecture	Quiz
Week 8	2	Gain the ability to write SQL queries for a given context in a relational database	SQL Query Development and Derived structures, SQL set Operations		Exam
Week 9	2	Gain the design and development of distributed systems and distributed systems applications.	Client/Server Database Environment	Lecture	Quiz Oral exam Homework

Week 10	2	Gain the design and development of distributed systems and distributed systems applications.	Internet Database Environment, Data Warehousing, Creating and Populating	Lecture	Quiz Oral exam Home work
Week 11	2	Gain the design and development of distributed systems and distributed systems applications.	Data and Database Administration	Lecture	Oral exam Home work
Week 12	2	Gain the design and development of distributed systems and distributed systems applications.	Distributed Database	Lecture	Quiz
Week 13	2	Gain the design and development of distributed systems and distributed systems applications.	Object-Oriented Data ModelingObject-Oriented Database Development	Lecture	Presentation
Week 14	2	Gain the design and development of distributed systems and distributed systems applications.	Students support	Lecture	Exam
Week 15	2		Study week and preparations for assignment submission and Exams		Exam
11. Course Evaluation:					
		Quizzes	2	5% (2.5)	

		Assignments	2	15% (4.5)	
		Project	1	10% (3)	
		Midterm Exam	2 hr	10% (30)	
		Final Exam	3hr	60% (60)	
Required Textbooks: Hoffer, Prescott& McFadden, (2005). " Modern Database Management", (7th ed.) Prentice- Hall, Inc. ISBN: 0-13-145320-3.					
Main reference: Lectures and notes					
Recommended Textbooks: Bagui, S. & Earp, R(2004). "Learning SQL A Step-Step Guide using Access" Addison-Wesley Publishing. ISBN: 0-32-111904-5.					
Electronic Reference/ Website:					

Course Description Form

139.	Course Name:
	Image Processing
140.	Course Code:
	IMPR355
141.	Semester/Year:
	Second semester/ Third year
142.	Description Preparation Date:
	8/4/2024

143. Available Attendance Forms:
Physical attendance in class
144. Number of Credit Hours(Total)/Number of Units(Total)
30/2
145. Course administrator's name (mention all, if more than one name)
Name: Akram Abdul Mawjood Dawood , Dr. amar Idrees daood Email: akram.dawood@uomosul.edu.iq , amar.daood@uomosul.edu.iq
146. 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.

147. Teaching and Learning Strategies	
	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

Strategy	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.

148. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
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 in images removals	Lecture	Homework
Week8	2hr	Executing and designing appropriate image restoration systems.	System model, Image restoration.	Lecture	Quiz
Week9	2hr	Executing and designing appropriate image restoration systems.	Measurements of image 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
Week15	2hr				Final Exam

149. 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

As		Time/Number	Weight (Marks)
Formative assessment	**Quizzes**	2	15% (15)
	Onsite Assignments	1	5% (5)
	Report	1	10% (10)
Summative assessment	**Midterm Exam**	2 hr	10% (10)
	Final Exam	3hr	60% (60)
		Total assessment	100% (100 Marks)

150. 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 (scient 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	

Course Description Form

151. Course Name:
Fundamentals of Control Systems
152. Course Code:
CO402
153. Semester/Year:
Seven semester/ Four year
154. Description Preparation Date:
31/3/2024
155. Available Attendance Forms:
In class / on meet
156. Number of Credit Hours(Total)/Number of Units(Total)

200/8

157. 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

158. 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.

159. 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.

160. 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 diagram.	Mathematical representation of control system [ch2]	Lecture & Tutorial	Oral exam Home work
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

161. Course Evaluation

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

162. Learning and Teaching Resources

Required textbooks(curricular books,	Modern control Engineering by Katsuhiko ogata

if any)	
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

1. Course Name:
Computer Graphics
2. Course Code:
COGR405
3. Semester/Year:
Second/fourth
4. Description Preparation Date:
28/3/2024
5. Available Attendance Forms:
Physical attendance
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: Amar Daood Email: Amar.daood@uomosul.edu.iq Name: Dr.Sura Nawfal abdulrazzaq Email: Sura.nawfal@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Be familiar with the basics of computer graphic operations. • Learn the concepts and the principles of the Scan conversion. • Understand and analyze the procedures of the Clipping Algorithm. • Comprehend all the required Transformations in motion and the animated scenes.

9. Teaching and Learning Strategies

Strategy	1- Apply knowledge of mathematics, science, and engineering. 2- Learn all basic mathematical behind computer graphic and animation design. 3- Ability to work effectively within multidisciplinary teams
	4-

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
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 Algorith	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 OpenGL	lecture	Oral Exam Homework
12	2	Code in OpenGL	OpenGL programm	lecture	Oral Exam
13	2	Learn by examples	OpenGL examples	lecture	Oral Exam
14	2	Learn by	OpenGL applicatio	lecture	Oral Exam

		application			
15					

11. Course Evaluation

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

12. Learning and Teaching Resources

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

Course Description Form

1. Course Name:
Real Time Systems
2. Course Code:
RETS404
3. Semester/Year:
First/ Fourth
4. Description Preparation Date:
28/3/2024
5. Available Attendance Forms:
Physical attendance
6. Number of Credit Hours(Total)/Number of Units(Total)
150/6
7. Course administrator's name (mention all, if more than one name)
Name: amar daood Email: Amar.daood@uomosul.edu.iq Name: Basman Mahmood Email: bm.alhafidh@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Be familiar with the basics of real time system. • Analyze and design any required real time system and provide solutions to any problem will be faced during testing stage. • Understand the basic knowledge of the sensor's types. • Be familiar with the Signal conditioning. • Have the ability to code with the Real time languages.

9. Teaching and Learning Strategies	
Strategy	5- Apply knowledge of mathematics, science, and engineering 6- Ability to work effectively within multidisciplinary teams 7- Identify, formulate, and solve engineering problems

10. 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 data base and Real	lecture	Oral Exam

		Real time languages	time languages		
	15		**Final exam**		
			Classifying real time system, HW & SW		

11. Course Evaluation

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

12. Learning and Teaching Resources

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

Course Description Form

1. Course Name:
Artificial Intelligence
2. Course Code:
CE306
3. Semester / Year:
First semester / Fouth year
4. Description Preparation Date:
30/3/2024
5. Available Attendance Forms:
Attend
6. Number of Credit Hours (Total) / Number of Units (Total):
3/75
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Ali Mukhlif Ahmed Al-Saegh E-mail: ali.alsaegh@uomosul.edu.iq Name: Akram Abdulmawjood E-Mail: akram.dawood@uomosul.edu.iq
8. Course Objectives

Course Objectives	• This course let the students to be familiar with some of the new algorithms and methods in artificial intelligence and machine learning. • The algorithms are based on the natural behavior of the different organisms. • Also, to give the ability to apply these methods in designing and understanding real-world systems.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to 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 sim 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	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	

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

	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**

12. 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

Course Description Form

163. Course Name:
Public safety
164. Course Code:
DIEL251
165. Semester/Year:
1st semester/4th year
166. Description Preparation Date:
28/3/2024
167. Available Attendance Forms:
0n class-google meet
168. Number of Credit Hours(Total)/Number of Units(Total)

169. Course administrator's name (mention all, if more than one name)
Name: modhar ahmed hammoudy hussain Email: modharhammoudy@uomosul.edu.iq

170. Course Objectives	
Course Objectives	This course focuses on meaning of public safety, and verifying the hazard types and the safety margins, risks, controlling for all types of hazards. The course includes activities and exercises that guide students to interface and deal with many problems issues in the real practical life, so it will be easier to face such of these problems in the future.

171. Teaching and Learning Strategies	
Strategy	1. An ability to skillfully communicate orally with gathering of people and in writing with various managerial levels. 2. An ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments taking into account the consequences in worldwide financial, ecological and social considerations. 3. An ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble and apply it properly 4. An ability to work adequately on teams and to set up objectives, plan activities, meet due dates, and manage risk and uncertainty.

172. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	2	Naming all the Types of hazards in the work places	What is health and safety all about?	lecture	oral exam
Week 2	2	Using the basic concepts of engineering to determine the risk levels for the work places	Getting started – hazards, risk assessment and control	lecture	oral exam
Week 3	2	Monitoring the figure of merit of the safety and controlling ways	Managing health and safety	Lecture	oral exam
Week 4	2	Select the suitable assessments after summarizing the hazard types of work palaces	Monitor and review of health and safety performance	Lecture	oral exam
Week 5	2	Ability of decide suitable assessment for any situations	Framework of health, safety and fire law	Lecture	Quiz
Week 6	2	Make the place healthy and safety to perform a certain duty	Consultation and safety representatives	Lecture	oral exam
Week 7	2	Naming all the Types of hazards	Control of safety hazards	Lecture	oral exam
Week 8	2	Naming all the Types of dangerous materials	Hazardous substances – Health hazards	Lecture	oral exam
Week 9	2	Make the place healthy and safety to perform a certain duty.	Providing a health and safety method statement	Lecture	Quiz

Week 10	2	some types of hazards	Physical and psychological health hazards	Lecture	oral exam
Week 11	2		Term exam		Exam
Week 12	2	Make the place healthy and safety to perform a certain duty	Construction and contractors	Lecture	oral exam
Week 13	2	Ability of deconstruct any situation to evaluate the problems	Accidents and emergencies	Lecture	oral exam
Week 14	2	Select the suitable solution after summarizing the different types of hazards	Sources of information and guidance	Lecture	oral exam
Week 15	2		Final exam		Exam

173. Course Evaluation

2-quizzes 5
Project 10
Term Exam 25
Final Exam 60

174. Learning and Teaching Resources

Required textbooks(curricular books, if any)	
Main references (sources)	"Easy Guide to Health and safety" by: Phil Hughes, Liz Hug (2008)
Recommended books and references (scientific journals, reports)	
Electronic references, websites	

Course Description Form

1. Course Name:	
Wireless Networks	
2. Course Code:	
WINE406	
3. Semester/Year:	
First / 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)	
30/2	
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	1-This course will cover the fundamental aspects of wireless networks, with emphasis on current and next-generation wireless networks. 2-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. 4-Introduction of Wireless Mesh Networks (WMNs), MAC and Network Layers of WMNs. 5- Introduction of Mobile Ad-Hoc Networks (MANET), MAC and Network Layers of Mobile Ad-Hoc Networks (MANET). 6- 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. 7-Introduction of Wireless Network Coding (WNC). 8- 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	2	Identify and describe the basics of wireless networks	Introduction to Wireless Signal Propagation	Lecture	
2	2	Explain and compare with various types of Coding And Modulation	Introduction to Wireless Coding And Modulation	Lecture	Quiz
3	2	Identify and describe the basics of wireless	Fundamentals of Wireless Networks Technology	Lecture	

		networks			
4,5	4	Explain and compare various types of wireless networks IEEE 802.11	Wireless LANs (IEEE 802.11x)	Lecture	Home work
6	2	Identify and describe IEEE 802.11 Distributed Coordination Function	IEEE 802.11 Distributed Coordination Function	Lecture	Home work
7,8	4	Identify and describe Bluetooth IEEE 802.15.1	Bluetooth IEEE 802.15.1	Lecture	Quiz
9	2	Identify and describe the Internet of Thing	Introduction Internet of Things (IoT)	Lecture	
10	2	Identify and describe the Wireless Mesh Networking (WMN)	Introduction Wireless Mesh Networking (WMN)	Lecture	Quiz
11,12	4	Identify and describe the Wireless Sensor Network (WSN)	Introduction Wireless Sensor Network (WSN)	Lecture	Home work
13,14	4	Identify and describe the Mobile Ad Hoc Wireless Network (MANET)	Introduction Mobile Ad Hoc Wireless Network (MANET)	Lecture	Quiz
15	2	Identify and describe The Wireless Network Architecture and Wireless Device Roles	Wireless Network Architecture and Wireless Device Roles	Lecture	Exam

11. Course Evaluation

Quizzes	**12% (12)**	**4**
Assignments	**3% (3)**	**3**
Midterm Exam	**25% (25)**	**2 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

1. Course Name:	
Advanced Computer Architecture	
2. Course Code:	
ACAR408	
3. Semester/Year:	
First semester / Fourth year	
4. Description Preparation Date:	
31/3/2024	
5. Available Attendance Forms:	
In class	
6. Number of Credit Hours(Total)/Number of Units(Total)	
30/2	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Ula Tarik Salim	Email: ula.tariq@uomosul.edu.iq
8. Course Objectives	
Course Objectives	Provides the necessary knowledge to • design a new computer system • improve an existing architecture • develop fast parallel computing algorithms a systems
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encoura students' participation in the exercises, while at the same time refining a expanding their critical thinking skills. This will be achieved through class

	interactive tutorials and by considering type of simple experiments involving sc sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Understanding the factors that influence computer speed, including hardware design, architectural choices, and algorithmic efficiency. In addition, understanding of the architecture of standard computers, including the organization and design principles of processors, memory systems, and I/O subsystems	Computer Speed and the Architecture of Standard Computers	Lecture	Exam
2	2	Understand the advantages and challenges of parallel computing and how it can improve performance in certain applications	Flynn Classification	Lecture	Exam
3	2	Understand how performance metrics are measured and evaluated, including concepts such as latency, throughput, and Amdahl's Law	The Performance, Cost and Amdahl's Law	Lecture	Home work, Quiz, Exam

4	2	Study the memory hierarchy in computer systems and understand the role of cache memory in improving performance	Cache Memory	Lecture	Exam
5	2	Learn about cache organization, replacement policies, and cache coherence protocols	Cache Memory	Lecture	Home work, Exam
6	2	Study memory interleaving technique to enhance memory access efficiency	Memory Interleaving	Lecture	Home work, Exam
7	2	Identify the hardware design for arithmetic operations (addition/ subtraction)	Parallel Arithmetic (Carry Save Adder)	Lecture	Home work, Exam
8	2	Identify the hardware design for arithmetic operation (multiplication)	Parallel Arithmetic (Carry Save Multiplier)	Lecture	Exam
9	2		Mid-term Exam1	Lecture	Exam
10	2	Understand the design principles, and applications associated with the parallel processing architectures including SIMD and vector processors	SIMD Architecture (Vector Processor)	Lecture	Exam
11	2	Understand the design principles, and applications	SIMD Architecture	Lecture	Home work, Quiz, Exam

		associated with the parallel processing architectures including SIMD and vector processors	(Vector Processor)		
12	2	Understand the design principles, algorithms, and applications associated with the architecture DSP	Mid-term Exam2 + Digital Signal Processor	Lecture	Exam
13	2	Understand the design principles, algorithms, associated with the architecture of Array Processors Such as DFT and FFT	Array Processor (DFT and FFT processor)	Lecture	Home work, Exam
14	2	Understand the application and architecture of DFT and FFT Understand the design principles of 1D Systolic Array Processor architecture and its application on 1D convolution	Array Processor (DFT and FFT processor), Systolic Array Processor (1D)	Lecture	Exam
15		Preparatory week before the final Exam			Exam

11. Course Evaluation

Quizzes(9), Homeworks(6), Midterm Exam1(15), Midterm Exam2(10),Final exam (60)

12. 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

1. Course Name:	
English Language – Upper-intermediate	
2. Course Code:	
N/A	
3. Semester / Year:	
2nd semester / 4th year	
4. Description Preparation Date:	
29/3/2024	
5. Available Attendance Forms:	
In class only	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours / 2 units	
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	• Speak about topics contained in the textbook accurately and fluently (with a certain error-tolerance). • Use basic reading techniques (scanning, skimming, and selecting what is relevant). To be able to follow English lessons, to follow instructions, descriptions and explanations, to take notes when listening.

	• Understand a complicated sentence construction and relations between sentences from a language point of view; to acquire new semi-technical vocabulary. • Use a wide range of vocabulary. • Apply newly acquired knowledge of grammar. • Understand, analyze, translate, and paraphrase texts. • Understand, analyze, translate, and paraphrase listening.

9. Teaching and Learning Strategies

Strategy	• Theoretical lecturing. • Group working. • One-to-one speaking test. • Passage reading and questioning. • Extracting information from audio scripts.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation
1	2	- Introducing the subject / different activities. - The strategy of evaluating. - The course contents.	**Introduction to the course**	**Theory about the subject and the course plan.**	N/A
2	2	- Simple, continuous, perfect, active and passive tenses. - Compound words. - Reading.	**Unit 1: Home and away! (part 1)**	**Reading paragraphs, study grammar, listen to audio scripts.**	
3	2	- Simple, continuous, perfect, active and passive tenses. - Compound words. - Reading.	**Unit 1: Home and away! (part 2)**	**Reading paragraphs, study grammar, listen to audio scripts.**	
4	2	- Simple, continuous, perfect, active and passive tenses. - Compound words. - Reading.	**Unit 1: Home and away! (part 3)**	**Reading paragraphs, study grammar, listen to audio scripts.**	Homework 1
5	2	- Present perfect and simple and continuous. - Spoken English. - Hot verbs: make, do.	**Unit 2: Been there, got the T-shirt (part 1)**	**Reading paragraphs, study grammar, listen to audio scripts.**	Quiz 1

	- Reading.			
6	2	- Present perfect and simple and continuous. - Spoken English. - Hot verbs: make, do. - Reading.	**Unit 2: Been there, got the T-shirt (part 2)**	**Reading paragraphs, study grammar, listen to audio scripts.**	
7	2	- Present perfect and simple and continuous. - Spoken English. - Hot verbs: make, do. - Reading.	**Unit 2: Been there, got the T-shirt (part 3)**	**Reading paragraphs, study grammar, listen to audio scripts.**	Homework 2
8	2	- Narrative tenses: past simple, past continuous, past perfect, active and passive. - Spoken English. - Reading.	**Unit 3: News and views (part 1)**	**Reading paragraphs, study grammar, listen to audio scripts.**	Quiz 2
9	2	- Narrative tenses: past simple, past continuous, past perfect, active and passive. - Spoken English. - Reading.	**Unit 3: News and views (part 2)**	**Reading paragraphs, study grammar, listen to audio scripts.**	
10	2	- Narrative tenses: past simple, past continuous, past perfect, active and passive. - Spoken English. - Reading.	**Unit 3: News and views (part 3)**	**Reading paragraphs, study grammar, listen to audio scripts.**	Homework 3
11	2	Three language skills are assessed in the written exam which are listening, reading, and writing.	**Written test (for listening, reading, and writing skills)**		Quiz 3
12	2	The speaking skill is tested for each student for 2 to 3 minutes of daily English spoken topics.	**Speaking test (part 1)**		Speaking sessions
13	2	The speaking skill is tested for each student for 2 to 3 minutes of daily English spoken topics	**Speaking test (part 2)**		Speaking sessions
14	2	Presentation is done by a group of 2 students for 3-5 minutes. Including critical notes after performing.	**Presentation (part 1)**		On stage

15	2	Presentation is done by a group of 2 students for 3-5 minutes. Including critical notes after performing.	**Presentation (part 2)**		On stage

Course Description Form

1. Course Name:
Biometrics Engineering
2. Course Code:
BIEN411
3. Semester/Year:
First / Fourth
4. Description Preparation Date:
5/4/2024
5. Available Attendance Forms:
Lectures
6. Number of Credit Hours(Total)/Number of Units(Total):
30 Hours /2 Units
7. Course administrator's name
Name: Asst. Prof. Dr. Mayada Faris Ghanim Email: mayada.faris@uomosul.edu.iq
8. Course Objectives

Course Objectives	• The main objectives of a Biometrics Engineering course typically revolve around educating students on various aspects of biometrics technology and its applications. Here are some common objectives: • Understanding Biometrics Principles: To impart fundamental knowledge about biometrics, including its principles, techniques, and methodologies for

	recognizing individuals based on their physiological or behavioral characteristics. • Exploring Biometric Technologies: To introduce students to various biometric modalities such as fingerprint recognition, iris recognition, facial recognition, voice recognition, etc., including their underlying mechanisms, advantages, limitations, and real-world applications. • Technical Proficiency: To develop technical skills necessary for designing, implementing, and evaluating biometric systems, including signal processing techniques, feature extraction, pattern recognition algorithms, and machine learning approaches. • Security and Privacy: To address the security and privacy concerns associated with biometric systems, including issues related to data protection, biometric template security, spoof attacks, and ethical considerations.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this subject is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering some sampling activities that are interesting to the students.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify the main terminologies of Biometrics Engineering	Introduction to Biometrics Engineering	Theory	Exam
2	2	Identify the main terminologies of Biometrics Engineering	Biometrics and Authentication	Theory	Exam Quiz
3	2	Understand Biometric Performance Metrics	Biometrics Performance Evaluation Criteria	Theory	Exam
4	2	Compare and Contrast Operation Modes	Operation Modes of Biometric System	Theory	Exam
5	2	Understand the Principles of Face Recognition	Face Recognition System	Theory	Exam
6	2	Understand Biometric Performance of the system	Real Face Recognition System	Theory	Exam Assignment
7	2		Term Exam 1	Theory	Exam

8	2	Understand the Principles of Iris Recognition	Iris Recognition System	Theory	
9	2	Understand Biometric Performance of the system	Real Iris Recognition System	Theory	Exam
10	2	Understand the Principles of Handwriting Recognition	Handwriting Recognition System	Theory	Exam Quiz
11	2	Understand Biometric Performance of the system	Real Handwriting Recognition System		
12	2	Understand Multimodal Biometrics	Multimodal Biometrics	Theory	Exam
13	2	Understand the principle of Continuous Authentication System working	Biometrics Continuous Authentication Systems	Theory	Exam
14	2	Explore Biometric Applications in Electronic Health Records (EHR)	Biometrics in Healthcare	Theory	Exam

15	2		Term Exam 2	Theory	

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

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• Theses from University of Mosul . • Anil K. Jain, Arun Ross, and Karthik Nandakumar, “Biometric Recognition: Challenges and Opportunities”, Springer, 2011

Course Description Form

1. Course Name:
Professional Ethics
2. Course Code:
CO401
3. Semester/Year:
First semester / First year
4. Description Preparation Date:
28-03-2024
5. Available Attendance Forms:
On site
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: Joan Atheel Ahmed

Email: joan.akrawi@uomosul.edu.i

Name: Hasan Fakhry Hasan

Email: hasan.allayla@uomosul.edu.iq

8. Course Objectives

Course Objectives	• define and understand concepts of ethics and professional ethics. • develop knowledge of and describe basic ethical theories and princip for ethical decision-making. • identify and think through moral situations and issues encountered by wide range of different professionals. • apply ethical theories and principles to specific moral challenges and dilemmas faced by professionals. • develop and improve skills essential in analyzing and resolving ethic problems and conflicts in professional settings through the use and application of ethical theories.

9. 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.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
Week 1	2	Defines and understands concepts	Introduction .earning Outcomes	On class	ıl exam

		Morals and ethics Professional			
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 not Moral	Possible Answer Self-Assessment Exercise	On class	Quiz
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	Egoism Psychological Egoism Ethical Egoism	On class	Quiz

		applications and/or ,Use cases			
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 Moral interest relevant in the scenario	Normative Ethical Theories – Virtue Ethics	On class	Quiz Oral exam Home work
Week	2	Identify owners	The Nature of Moral	On	Oral exam

11		Moral interest relevant in the scenario	Virtue Aristotle's Virtue Ethics	class	Home work
Week 12	2		Report	On class	Quiz
Week 13	2	Learn about some important moral values And interests nd the risks And conflicts vulnerab	Ethical Principles r 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

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 1- Monthly exam 25%-100% 2- 10%-100% report 3- Daily preparation 5%-100% 4- Final exam 60% - 100%	
12. 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

1. Course Name:
Digital Control
2. Course Code:
CO403
3. Semester/Year:
Second semester/ Four year
4. Description Preparation Date:
2/4/2024
5. Available Attendance Forms:
In class / on meet
6. Number of Credit Hours(Total)/Number of Units(Total)

200/8
7. 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
8. Course Objectives

Course Objectives	• The course provides the principles necessary to understand the modern digital control systems, how to analyze these systems in discrete time domain including different techniques and methods, also it learns how to design a complete digital controller, test its stability and improve it. Other topics that are covered sampling process, A/D, D/A converters, z-transform and s-transform relations. • Discuss the differences between digital and continuous control systems and identify its applications across different industries and contexts. • Solve digital control system problems using z-transform. Sketch simulation diagram of a digital control systems. • Analyze the systems by reducing the interconnection of sampled data transfer function to single sampled data transfer function . • Examine the time response of digital control sys and measuring the stability of these systems, and decide

	whether their initial design is acceptable or can be improved. • Produce design of digital control systems using transform techniques and state-space methods. • Produce design of various digital controllers using MATLAB and design a control system for motors. Integrate and program real-time control systems with smart sensors.

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
Week 1	3	Understand digital control, the structure of a digital control system, and examples of digital control systems.	Introduction to Digital Control [ch1]	Lecture	Oral exam
Week 2	3	An ability to solve the Discrete–time system Analysis.	Discrete-Time Systems [ch2]	Lecture &Tutorial	Oral exam Home work
Week 3	3	An ability to use Sampled data systems, ADC/DAC.	Discrete-Time Systems [ch2]	Lecture	Home work

Week 4	3	Understand the State equation and solution of state equation State diagram.	Discrete-Time Systems [ch2]	Lecture & Tutorial	Oral exam Home work
Week 5	3	Analyze the Zero-order hold transfer function (ZOH transfer function).	Fundamental of digital control system [ch3]	Lecture	Oral exam
Week 6	3	Analyze Z-transform and inverse z-transform, Final value theorem, 1st Quiz	Fundamental of digital control system [ch3]	Lecture & Tutorial	Quiz Home work
Week 7	3	An ability to discrete opened and closed loop T.F, Solution of Difference Equations, Solution of State Equations.	Transfer Function of Discrete Control Systems [ch4]	Lecture	Oral exam Home work
Week 8	3		Mid-term exam.		Exam
Week 9	3	Understand the Simulation diagram.	Transfer Function of Discrete Control Systems [ch4]	Lecture	Oral exam Home work
Week 10	3	Analyze the Transfer function and state space equations transformations	Stability of Digital Control System [ch5]	Lecture & Tutorial	Quiz Home work
Week 11	3	Understand the Time response of digital control system, 2nd quiz	Stability of Digital Control System [ch5]	Lecture	Oral exam
Week 12	3	Apply the Relationship between z-plane & z-plane	Control system analysis and design [ch6]	Lecture & Quiz	Quiz

Week 13	3	Analyze Jury's stability test, 3d quiz	Control system analysis and design[ch6].	Lecture	Oral exam
Week 14	3	Apply Z-domain root locus design	Control system analysis and design [ch6]	Lecture & Tutorial	Oral exam
Week 15	3		Final exam		Exam

11. Course Evaluation		
Quiz	3	10%
Assignment	8	20%
Midterm Exam	30	70%

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	Fadali, M.S. and Visioli, A., 2012. Digital control engineering: analysis and design. Academic Press.
Main references (sources)	Lectures and notes
Recommended books and references (scientific journals, reports)	Golnaraghi, F. and Kuo, B.C., 2017. *Automatic control systems*. McGraw-Hill Education.
Electronic references, websites	

Course Description Form

1. Course Name:
Industrial Networks
2. Course Code:
INNE454
3. Semester / Year:
2nd semester / 4th year
4. Description Preparation Date:
29/3/2024
5. Available Attendance Forms:

In class only

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

30 hours / 2 units

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

Name: Dr. Qutaiba Ibrahim Ali
Email: qutaibaali@uomosul.edu.iq

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

8. Course Objectives

Course Objectives	This course will cover many topics such as Corporate and industrial networks, OSI model, Ethernet and TCP/IP, Modbus, Foundation Fieldbus, DevicNet, PROFIBUS, AS-I, propriety buses protocols and interfaces, distributed I/O, drivers and devices and their implementation in PC and PLC based systems.

9. Teaching and Learning Strategies

Strategy	• Theoretical lecturing. • Group discussion. • Report and presentation. • Homework.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation
1-4	8	Understanding course introduction, Basic Elements of an Automated System, Levels of Automation, Process Industries vs. Discrete Manufacturing Industries, Continuous Control, DCS Systems, Networking: Process Control, Supervisory Control, enterprise Control	**Industrial Control Systems and Networking**	**Lecturing in class** **Group discussion**	Quiz 1
5-6	4	Understanding TCP and UDP, Troubleshooting, Socket	**Industrial**	**Lecturing in class**	

		programming, Automation Trends, TCP/IP Based Factory Automation, Thin Servers, Network Security	**Ethernet & TCP/IP**	**Group discussion**	
7-8	4	Understanding topics covered: ODVA, OSI reference model, EtherNet/IP Terms & Definitions, Design of Ethernet IP Networks, Web Compatible SCADA Systems.	**Ethernet IP**	**Lecturing in class Group discussion**	Quiz 2
9	2	Topics covered: Modbus Overview, Modbus Protocol Structure, Modbus Function Codes, Troubleshooting, Modbus Plus Technical Overview	**Modbus, Modbus Plus and Modbus TCP**	**Lecturing in class Group discussion**	Homework
10	2	Topics covered: CAN Technical Overview, Application Layers, CANopen, DeviceNet Technical Overview, ODVA,	**CANBUS and DeviceNet**	**Lecturing in class Group discussion**	Report assignment
11	2	Topics covered: Reduced IOS reference model, AS-interface, Technical Overview, AS-i Applications, AS-i Consortium, AS-i Troubleshooting	**AS-I Interface**	**Lecturing in class Group discussion**	
12	2	Introduction to Profibus, Profibus-PA (Process Automation), Profibus-DP (Decentralized Periphery), Network design and configuration	**Profibus**	**Lecturing in class Group discussion**	Quiz 3
13-14	4	- Understanding different industrial IoT devices and differences between IoT and IIoT.	**Industrial Wireless Sensor Network**	**Lecturing in class Group discussion**	
15	2	The gathered knowledge throughout the course is tested.	**Written test**		Term exam

Course Description Form

1. Course Name:
Network Security
2. Course Code:

NESE453	
3. Semester/Year:	
Second / Fourth	
4. Description Preparation Date:	
5/4/2024	
5. Available Attendance Forms:	
Lectures	
6. Number of Credit Hours(Total)/Number of Units(Total):	
30 Hours /2 Units	
7. Course administrator's name	
Name: Asst. Prof. Dr. Mayada Faris Ghanim Email: mayada.faris@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	On successful completion of this course students will be able to: • Identify the main terminologies of Network security such as C-I-A triad and cryptography • Recognize the impact that malicious exploits and attacks have on network security • Comparing between different algorithms for encryption and other services of network security • Evaluating the level of protection through the value of the encryption work factor • Analyzing the steps of encryption and decryption algorithms • Describing the ways of implementing access control • Describing the modes of IPSec security

	• Listing IPSec protocols and describing their principles of operation • Understanding the establishment of the security parameters via security association

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Identify the main terminologies of Network security	Introduction to Network Security	Theory	Exam
2	2	Identify the main terminologies of Network security	The OSI Security Architecture	Theory	Exam Quiz
3	2	Recognize the impact that malicious exploits and attacks have on network security	Authentication	Theory	Exam

4	2	Identify the main terminologies of Cryptography	Cryptography Principles	Theory	Exam
5	2	Evaluating the level of protection through the value of the encryption work factor	Work factor and Data Encryption Standard (DES) Part 1	Theory	Exam
6	2	Analyzing the steps encryption and decryption algorithms	Work factor and Data Encryption Standard (DES) Part 2	Theory	Exam Assignment
7	2	Analyzing the steps encryption and decryption algorithms	Advanced Encryption Standard (AES) Part 1	Theory	Exam
8	2		Term Exam 1	Theory	
9	2	Describing the ways of implementing access control	Access Control	Theory	Exam
10	2	Describing the modes of IPSec security	IP Security	Theory	Exam Quiz
11	2	Describing the types of Firewalls	Firewalls		

12	2	Understanding the importance of AI in network security	Introduction to Artificial intelligence in network security	Theory	Exam
13	2	Describing the main applications of using AI in network security	Artificial intelligent Applications in network security	Theory	Exam
14	2	Identify the principles and methods of security in OS	Security in operating system	Theory	Exam
15	2		Term Exam 2	Theory	

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

12. Learning and Teaching Resources	
Required textbooks(curricular books, if any)	• Charles P. Pfleeger, Shari Lawrence Pfleeger and Jonathan Margulies, “Security in Computing”, Prentice Hall, fifth edition, ISBN-13: 978-0-13-408504-3, 2015. • William Stallings, “Cryptography and Network Security Principles and

	Practice", Pearson Education, seventh edition, ISBN 978-0-13-444428-4, 2017

Course Description Form

1. Course Name:	
Distributed Systems	
2. Course Code:	
DISY457	
3. Semester/Year:	
Second-Semester / Fourth year	
4. Description Preparation Date:	
8/4/2024	
5. Available Attendance Forms:	
In class	
6. Number of Credit Hours(Total)/Number of Units(Total)	
60/2	
7. Course administrator's name (mention all, if more than one name)	
Name: Ass. Prof. Dr. Turkan Ahmed Khaleel Email: turkan@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	• Understand the fundamental concepts a principles of distributed systems architectu • Explore different communication models a protocols used in distributed computing. • Learn about distributed system models such client-server, peer-to-peer, and hyb architectures.
9. Teaching and Learning Strategies	
Strategy	• Interactive Lectures: Engagingly deliver lectures, encouraging questions and discussions to ensure students grasp fundamental concepts.

	• Case Studies: Present real-world examples of distributed systems architectures, failures, and successes to illustrate theoretical concepts in practical contexts. • Group Projects: Assign group projects that require students to design, implement, and analyze distributed systems, fostering collaboration and problem-solving skills.

10. Course Structure

Week	Hours	Required Le Outcomes	**Unit or subject name**	**Learning method**	Evaluation method
Week 1	2	Gain the characterization of Distributed Systems.	1 .Characterization of Distributed Systems 1.1 Introduction 1.2 Examples of distributed systems	Lecture	Oral exam
Week 2	2	Gain the characterization of Distributed Systems.	ı Distributed Systems 1.4 Focus on resource sharing	Lecture	Oral exam
Week 3	2	Gain the characterization of Distributed Systems.	1.5 Challenges 1.6 Case study: The World Wide Web	Lecture	Oral exam Homework

Week 4	2	Gain the design and development of distributed systems and distributed systems applications.	2. System Models 2.1 Introduction	Lecture	Quiz
Week 5	2	Gain the design and development of distributed systems and distributed systems applications.	2.2 Physical models 2.3 Architectural models	Lecture	Oral exam Homework
Week 6	2	Analyze the Failure Recovery in Distributed Systems and Fault Tolerance.	2.4 Fundamental models	Lecture	Quiz
Week 7	2	Gain the design and development of distributed systems and distributed systems applications.	3. Interprocess Communication 3.1 Introduction	Lecture	Quiz
Week 8	2	Gain the design and development of distributed systems and distributed systems applications.	3.2 The API for the Internet protocols 3.3 External data representation and marshaling		Exam
Week 9	2	Gain the design and development of distributed systems and distributed systems applications.	3.4 Multicast communication 3.5 Network virtualization: Overlay networks 3.6 Case study: MPI	Lecture	Quiz Oral exam Homework
Week 10	2	Gain the design and development of distributed systems and distributed systems applications.	4 .Remote Invocation 4.1 Introduction	Lecture	Quiz Oral exam Home work

Week 11	2	Gain the design and development of distributed systems and distributed systems applications.	4.2 Request-reply protocols 4.3 Remote procedure call 4.4 Remote method invocation 4.5 Case study: Java RMI	Lecture	Oral exam Home work
Week 12	2	Gain the design and development of distributed systems and distributed systems applications.	5 .Indirect Communication 5.1 Introduction 5.2 Group communication	Lecture	Quiz
Week 13	2	Gain the design and development of distributed systems and distributed systems applications.	5.3 Publish-subscribe systems 5.4 Message queues 5.5 Shared Memory Approaches	Lecture	Presentation
Week 14	2	Gain the design and development of distributed systems and distributed systems applications.	Students support	Lecture	Exam
Week 15	2		Study week and preparations for assignment submission and Exams		Exam
11. Course Evaluation:					
		Quizzes	2	5% (2.5)	
		Assignments	2	15% (4.5)	
		Project	1	10% (3)	

		Midterm Exam	2 hr	10% (30)	
		Final Exam	3hr	60% (60)	
Required Textbooks: 1- Distributed Systems: Concepts and Design by G. Coulouris, J. Dollimore, and T. Kindberg, 5th edition, 2011.					
Main reference: Lectures and notes					
Recommended Textbooks: Distributed Computing: Concepts and Applications by M.L Liu,. 1st edition, 2006.					
Electronic Reference/ Website:					