

**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**

**2026**

## **Introduction:**

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

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

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

### **Concepts and terminology:**

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

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

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

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

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

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

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

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

## Academic Program Description Form

University Name: University of Mosul

Faculty/Institute: College of Engineering

Scientific Department: Mechatronics Engineering

Academic or Professional Program Name: Bachelor's degree in Mechatronics

Final Certificate Name: Bachelor of Science in Mechatronics Engineering

Academic System: Course System + Bologna Process

Description Preparation Date: September 2025

File Completion Date: September 2025

Signature:

Head of Department Name:

Dr. Aws Hazim Saber Anaz

Date: 7.4.2026

Signature:

Scientific Associate Name:

Dr. Ayman T Hameed

Date: 7-4-2026

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 7-4-2026

Signature:

Asst. Prof. Rana Burhan Abdulrah



Approval of the Dean

Omar M. Hamdoon

### **1. Program Vision**

To offer a world-leading research and educational mechatronics program with an emphasis on hands-on oriented training.

### **2. Program Mission**

Contribute to the advancement of engineering and technological reality, students' acquisition of theoretical and practical experience, communication skills and outstanding teamwork.

### **3. Program Objectives**

1. Successfully adapt to new situations in their professional careers within the global job market, by using the essential tools and fundamental background of the disciplines of Mechatronics Engineering in the areas of Electric and electronics sciences, computer sciences, Thermal and Fluid Sciences, Material Science, Machine Design and Production Engineering, robotics, communication, artificial intelligence, and automation; Or pursue additional degrees through graduate studies.
2. Apply design methodology in relation to mechatronics engineering, by incorporating the use of design standards, realistic constraints, and consideration of the economic, environmental, and social impact of the design.
3. Engage in professional service such as participation in professional societies, and to always consider and support professional ethics.
4. have a constant desire for professional development through life-long learning activities, self-confidence, creativity and leadership.

### **4. Program Accreditation**

Applied for program accreditation (under review)

### **5. Other external influences**

Higher-level decisions

<b>6. Program Structure</b>				
<b>Program Structure</b>	<b>Number of Courses</b>	<b>Credit hours</b>	<b>Percentage</b>	<b>Reviews*</b>
<b>Institution Requirements</b>	<b>8</b>	<b>18</b>	<b>%7</b>	
<b>College Requirements</b>	<b>15</b>	<b>71</b>	<b>%29</b>	
<b>Department Requirements</b>	<b>38</b>	<b>159</b>	<b>%64</b>	
<b>Summer Training</b>	<b>1</b>	<b>-</b>	<b>-</b>	
<b>Other</b>		<b>-</b>	<b>-</b>	

\* Note: Since the first three levels in the department are implemented according to the Bologna Process, while the current fourth level is still taught according to the traditional semester system, the fourth-level courses have been converted from the traditional credit-unit system to the ECTS system based on the principle that each semester in the Bologna system equals 30 ECTS. Since each semester of the fourth level includes 19 traditional units, an approximate conversion was adopted whereby courses with two units are assigned 3 ECTS, and courses with three units are assigned 5 ECTS. Accordingly, the total of 30 ECTS per semester and 60 ECTS per academic year is maintained, ensuring consistency with the Bologna Process requirements adopted in the previous levels.

## 7. Program Description

### First Level

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	المادة	SSWL	USSWL	ECTS	Type	Pre-request
UOM 1021	English Language I	اللغة الانكليزية I	33	17	2.00	S	
MTE 102	Mathematics I	الرياضيات I	63	87	6.00	B	
MTE 103	Physics I	فيزياء I	63	87	6.00	B	
MTE 104	Engineering Drawing & AutoCAD	الرسم الهندسي والرسم بواسطة الحاسوب	63	62	5.00	B	
UOM 1031	Computer I	I الحاسوب	48	27	3.00	B	
MTE 106	Electrical Circuits Analysis I	تحليل الدوائر الكهربائية I	78	72	6.00	C	
UOM 1040	Democracy and Human Rights	الديمقراطية وحقوق الانسان	33	17	2.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	المادة	SSWL	USSWL	ECTS	Type	Pre-request
UOM 1011	Arabic language I	اللغة العربية I	33	17	2.00	S	
MTE 109	Mathematics II	الرياضيات II	63	62	5.00	B	
MTE 110	Engineering Mechanics- Statics I	الميكانيك الهندسي - السكون	78	47	5.00	B	
MTE 111	Computer Programming	برمجة الحاسوب	63	62	5.00	B	
MTE 112	Manufacturing Processes	عمليات التصنيع	63	37	4.00	C	
MTE 113	Electrical Circuits Analysis II	تحليل الدوائر الكهربائية II	78	47	5.00	C	MTE 106
MTE 114	Physics II	الفيزياء II	48	52	4.00	B	

## Second Level

**Semester 1 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	المادة	SSWL	USSWL	ECTS	Type	Pre-request
UOM 2050	Crimes of the Baath regime in Iraq	جرائم نظام البعث في العراق	33	17	2.00	S	
MTE 202	Engineering Mechanics-Dynamics	الميكانيك الهندسي - الحركي	78	47	5.00	C	
MTE 203	Applied Mathematics I	الرياضيات التطبيقية I	78	72	6.00	B	MTE 109
MTE 204	Electronic Principles and Devices	مبادئ الالكترونك والنبائط	93	57	6.00	C	MTE 113
MTE 205	Electrical Machines	المكانن الكهربائيه	63	37	4.00	C	MTE 113
MTE 206	Thermodynamics	الديناميكا الحراريه	48	27	3.00	C	
UOM 2022	English Language 2	اللغه الانكليزية 2	33	17	2.00	C	
MTE 207	Experimental Methods for Engineers	الطرق المختبريه للمهندسين	33	17	2.00	C	

**Semester 2 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	المادة	SSWL	USSWL	ECTS	Type	Pre-request
MTE 208	Applied Mathematics II	الرياضيات التطبيقية II	93	57	6.00	B	MTE 109
MTE 209	Fluid Mechanics	ميكانيكا الموائع	63	37	4.00	C	
MTE 210	Mechanics of Materials	ميكانيكا المواد	63	37	4.00	B	
MTE 211	Digital Logic Design	تصميم الدوائر المنطقية	63	37	4.00	C	
MTE 212	Statistics	إحصاء	63	62	5.00	B	
MTE 213	Signals and Systems	الاشارات والنظم	33	17	2.00	C	MTE 203
UOM 2032	Computer2	الحاسوب 2	48	27	3.00	B	
UOM 2012	Arabic language2	اللغة العربية 2	33	17	2.00	S	

### Third Level

**Semester 1 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	المادة	SSWL	USSWL	ECTS	Type	Pre-request
MTE 301	Measurement and Instrumentation	الاجهزة والقياسات	63	37	4.00	C	
MTE 302	Control System	نظم السيطرة	93	57	6.00	C	MTE 208
MTE 303	Signal Processing	معالجة الإشارة	93	57	6.00	C	
MTE 304	Microprocessors & Assembly Language	المعالجات الدقيقة ولغة التجميع	93	57	6.00	C	
MTE 305	Mechanical Engineering Laboratory	مختبر الهندسة الميكانيكية	33	17	2.00	C	
MTE 306	Theory of Machines	نظرية الآلات	78	72	6.00	C	MTE 202

**Semester 2 | 30 ECTS | 1 ECTS = 25 hrs**

Code	Module	المادة	SSWL	USSWL	ECTS	Type	Pre-request
MTE 307	Heat Transfer	انتقال حرارة	63	62	5.00	C	MTE 206
MTE 308	Hydraulic & Pneumatic Systems	الأنظمة الهيدروليكية والهوائية	63	62	5.00	C	MTE 209
MTE 309	Computer Aided Machine Design I	تصميم الآلة بمساعدة الحاسوب 1	63	62	5.00	C	MTE 202
MTE 310	Microcontroller System Design	تصميم نظام المتحكم الدقيق	63	62	5.00	C	MTE 304
MTE 311	Numerical Methods	الطرق العددية	63	62	5.00	B	MTE 109
MTE 312	Power Electronics and Drive	الالكترونيات القدرة والمسوقات	63	62	5.00	C	MTE 204

## Fourth Level

Study Courses of the Department of Mechatronics Engineering / College of Engineering / University of Mosul Fourth Level / Semester System Track						
Semester 1 الفصل الدراسي الأول (25 Hours 19 Units)						
Code	Subject	اسم المادة	Weekly Hours			Units
			Theoretical	Tutorial	Laboratory	
MTE 401	Communication and Networking Engineering	هندسة الاتصالات والشبكات	2	0	0	2
MTE 402	Digital Control Systems	نظم سيطرة رقمية	2	1	2	3
MTE 403	Artificial intelligent	ذكاء اصطناعي	2	1	0	2
MTE 404	Image Processing	معالجة الصور	2	0	0	2
MTE 405	Industrial Automation I	أتمتة صناعية I	2	0	2	3
MTE 406	Design of Mechatronics System	تصميم أنظمة الميكاترونكس	2	0	2	3
MTE 407	Robotics I	الروبوتات I	2	0	2	2
MTE 408	Project I	مشروع I	1	0	2	2
<b>Total</b>			<b>15</b>	<b>2</b>	<b>8</b>	<b>19</b>
<b>Total Weekly Hours</b>			<b>25</b>			

Semester 2 الفصل الدراسي الثاني (25 Hours 19 Units)						
Code	Subject	اسم المادة	Weekly Hours			Units
			Theoretical	Tutorial	Laboratory	
MTE 409	Intelligent Control	سيطرة ذكية	2	1	0	2
MTE 410	Engineering Management	إدارة هندسية	2	0	0	2
MTE 411	Special Topics in Mechatronics	موضوعات خاصة في الميكاترونكس	2	1	0	2
MTE 412	Industrial Automation II	الأتمتة الصناعية II	2	0	2	3
MTE 413	Robotics II	الروبوتات II	2	0	2	3
MTE 414	Project II	مشروع II	1	0	2	2
MTE 415	Computer Interfacing	ربط بيني	2	0	2	3
MTE 416	Statistic II	الإحصاء II	2	0	0	2
<b>Total</b>			<b>15</b>	<b>2</b>	<b>8</b>	<b>19</b>
<b>Total Weekly Hours</b>			<b>25</b>			

## 8. Expected learning outcomes of the program

Knowledge	
A1	An ability to distinguish, identify, define, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.
A2	An ability to produce engineering designs that meet desired needs within certain constraints by applying both analysis and synthesis in the design process.
Skills	
B1	An ability to create and carry out proper measurements and tests with quality assurance, analyze and interpret results, and utilize engineering judgment to make inferences.
B2	An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels.
B3	An ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble, and apply it properly.
B4	An ability to work adequately on teams and to set up objectives, plan activities, meet due dates, and manage risk and uncertainty.
Ethics	
C1	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 societal considerations.

## 9. Teaching and Learning Strategies

- Theoretical lectures
- Discussion sessions
- Laboratory experiments
- Computer laboratories
- Projects
- Industrial training

## 10. Evaluation methods

- Midterm Exam.
- Final Exam.
- Quizzes / Short Exams.
- Homework Assignments.
- Reports.

- Practical Exams.
- Projects.
- Presentations.
- Discussion and Participation.

<b>11.Faculty</b>						
<b>Faculty Members</b>						
<b>Academic Rank</b>	<b>Specialization</b>		<b>Special Requirements/Skills (if applicable)</b>		<b>Number of the teaching staff</b>	
	<b>General</b>	<b>Special</b>			<b>Staff</b>	<b>Lecturer</b>
Professor	Computer Engineering	Computer Networks and Real-Time Systems			✓	
Assistant Professor	Electrical Engineering	Intelligent Control Systems			✓	
Assistant Professor	Mechanical Engineering	Numerical Thermal Power			✓	
Assistant Professor	Electrical Engineering	Intelligent Systems			✓	
Assistant Professor	Mechanical Engineering	Thermal Power			✓	
Assistant Professor	Computer Engineering	Artificial Intelligence Techniques in Signal Processing			✓	
Lecturer	Electrical Engineering	Control			✓	
Lecturer	Computer Techniques Engineering	Control			✓	
Lecturer	Mechanical Engineering	Fluid Mechanics				✓
Lecturer	Electrical Engineering	Power Electronics and Drives			✓	
Lecturer	Computer Engineering	Computer Engineering			✓	
Lecturer	Mechanical Engineering	Robotics and Control			✓	

Lecturer	Computer Engineering	Artificial intelligence			✓	
Lecturer	Electrical Engineering	Electronics Engineering			✓	
Lecturer	Electrical Electronics and Systems Engineering	Electronics Systems Engineering			✓	
Lecturer	Control and Computer Engineering	Robotics and Artificial Intelligence Engineering			✓	
Lecturer	Electrical and Electronic Engineering	Computational Intelligence			✓	
Lecturer	Computer Engineering	Automatic Control Systems			✓	
Lecturer	Computer Engineering	Real time systems			✓	
Lecturer	Electrical Engineering	Electrical Engineering			✓	
Lecturer	Mechanical Engineering	Mechanical Engineering			✓	
Assistant Lecturer	Electronics Engineering	Communication Engineering			✓	
Assistant Lecturer	Computer Science	Computer science			✓	
Assistant Lecturer	Computer Science	Computer science			✓	
Assistant Lecturer	Mechanical Engineering	Thermal			✓	
Assistant Lecturer	Electrical Engineering	Control			✓	
Assistant Lecturer	Electronics Engineering	Communication Engineering			✓	
Assistant Lecturer	Communication Engineering	Communication Engineering			✓	
Assistant Lecturer	Computer Engineering	Computer Engineering			✓	
Assistant Lecturer	Mechanical Engineering	Mechanical Engineering				✓

Lecturer	Mechanical Engineering	Applied Mechanics				✓
Assistant Professor	Electrical Engineering	Communication Engineering				✓
Assistant Lecturer	History	Modern History				✓
Lecturer	Translation	Pragmatics and Semantics				✓
Assistant Lecturer	History	Modern History				✓
Assistant Lecturer	Dams and Water Resources Engineering	Hydrology				✓
Lecturer	Arabic Language	Linguistics and Semantics				✓
Lecturer	Mechanical Engineering	Applied Mechanics				✓

## 12. Professional Development

### Mentoring new faculty members

The academic program of the Department of Mechatronics Engineering is designed to enhance the comprehensive knowledge and skills of new faculty members in various educational areas. The program begins by focusing on providing faculty members with the basic ability to manage their duties effectively. It then progresses to include the necessary processes and procedures to ensure the successful achievement of the targeted learning outcomes in different programs.

To achieve these objectives, the program includes the following main components:

- **Educational Courses:** New faculty members participate in educational courses aimed at improving the quality of the teaching process. These courses cover a range of topics, including training on teaching methods and effective strategies for engaging students and delivering course content.
- **Modern Trends in University Teaching:** Exploring innovative approaches to teaching and learning in higher education.
- **Student Assessment:** Courses and scientific workshops for new faculty members on the process of assessing students' performance and understanding.
- **Test Preparation:** Strategies for preparing fair and appropriate examinations.
- **University Policies:** Introducing the relevant laws, regulations, instructions, and e-learning platforms.
- **Continuous Evaluation:** Faculty members, whether full-time or part-time, are subject to continuous evaluation to identify areas that require development throughout their teaching

careers. This process helps ensure that faculty members continuously work on improvement and adaptation to meet the evolving needs of students and the university.

- **Professional Development Opportunities:** Faculty members are encouraged to participate in faculty development courses offered by the department or the university's Continuing Education Unit. These courses provide opportunities for faculty members to improve their skills, stay updated with trends in teaching and learning, and collaborate with colleagues.

#### **Professional development of faculty members**

Establishing cooperation and communication relationships with governmental bodies and ministries in order to identify opportunities for collaboration between the department and these ministries, and consequently create employment opportunities for graduates.

### **13. Acceptance Criterion**

The admission capacity of the Department of Mechatronics Engineering is determined within the admission plan and according to the department's capacity. The Scientific Committee determines the required number of new students to be admitted, then submits it to the Deanship, then to the University, and subsequently to the Ministry to obtain the official approvals.

To be eligible for admission to the Department of Mechatronics Engineering at the undergraduate level, applicants must meet certain requirements. The admission process is supervised by the Ministry of Higher Education and Scientific Research, which manages and automatically allocates students' admission to public universities and colleges based on their secondary school grades.

The main student admission requirements are as follows:

- a. Iraqi Nationality and Year of Birth: Applicants must hold Iraqi nationality.
- b. Iraqi Secondary School Certificate: Applicants must hold a certificate issued by an Iraqi secondary school accredited by the Ministry of Education.
- c. Medical Certificate: Applicants must submit a medical certificate confirming that they meet the required health conditions.
- d. Full-Time Enrollment: Applicants must commit to being full-time students, dedicating their time and effort to their studies in the department.
- e. Not Continuing Study in Another College: Applicants must not be enrolled or continuing their studies in another college.
- f. Non-Iraqi Students: Incoming non-Iraqi students who hold a certificate from an Iraqi secondary school are admitted according to the central admission system.
- g. Admission of Technical Institute Graduates: The top 10% of technical institute graduates may be admitted.
- h. Admission of Talented Students: Talented students may be admitted according to the applicable regulations.

#### 14. The most important sources of information about the program

- **University Guide.**
- **Department Website:** University of Mosul – College of Engineering – Department of Mechatronics Engineering.  
<https://uomosul.edu.iq/en/engineering/>

#### 15. Program Development Plan

To enhance the quality of education, improve graduate outcomes, and meet the required competencies, the Department Council decided to adopt the **Bologna Process for Education**. This system includes the **European Credit Transfer and Accumulation System (ECTS)** instead of the currently adopted system, in line with the department's commitment to continuous improvement.

The new system will be implemented starting from the academic year **2025–2026**. The adoption of the Bologna Process is expected to achieve several benefits:

- **Student-Centered Learning:** The system places students at the core of the learning process, thereby enhancing the overall educational system.
- **Increased Classroom Interaction:** Continuous interaction between faculty members and students promotes a more dynamic learning environment.
- **Focus on Professional and Practical Skills:** Emphasis is placed on acquiring practical skills relevant to professional development.
- **Opportunity for Continuous Learning:** Students will have the opportunity for continuous learning, assessment, and feedback.
- **Semiannual Performance Assessment:** The system allows students' performance to be evaluated twice a year, providing more comprehensive feedback.
- **Deepening Understanding of Subjects:** The system is expected to contribute to deepening students' understanding of the subjects.

## Program Skills Outline

				Required program Learning outcomes						
Year/ Level	Course Code	Course Name	Basic or optional	Knowledge		Skills				Ethics
				A1	A2	B1	B2	B3	B4	C1
<b>First</b>	UOM 1021	English Language I	Basic				✓	✓	✓	
	MTE 102	Mathematics I	Basic					✓		
	MTE 103	Physics I	Basic		✓	✓	✓	✓		✓
	MTE 104	Engineering Drawing & AutoCAD	Basic	✓	✓	✓	✓		✓	
	UOM 1031	Computer I	Basic	✓	✓			✓		
	MTE 106	Electrical Circuits Analysis I	Basic	✓		✓		✓	✓	
	UOM 1040	Democracy and Human Rights	Basic							
	UOM 1011	Arabic language I	Basic							
	MTE 109	Mathematics II	Basic	✓				✓	✓	
	MTE 110	Engineering Mechanics-Statics I	Basic	✓		✓			✓	
	MTE 111	Computer Programming	Basic	✓	✓			✓		
	MTE 112	Manufacturing Processes	Basic	✓	✓	✓	✓	✓	✓	✓
	MTE 113	Electrical Circuits Analysis II	Basic	✓		✓		✓	✓	
	MTE 114	Physics II	Basic	✓					✓	✓
<b>Second</b>	UOM 2050	Crimes of the Baath regime in Iraq	Basic							✓
	MTE 202	Engineering Mechanics-Dynamics	Basic	✓		✓			✓	
	MTE 203	Applied Mathematics I	Basic	✓		✓		✓		
	MTE 204	Electronic Principles and Devices	Basic	✓	✓	✓			✓	
	MTE 205	Electrical Machines	Basic	✓	✓	✓			✓	
	MTE 206	Thermodynamics	Basic	✓	✓			✓		
	UOM 2022	English Language 2	Basic				✓	✓	✓	
	MTE 207	Experimental Methods for Engineers	Basic	✓		✓	✓			✓

	MTE 208	Applied Mathematics II	Basic	✓				✓	✓	
	MTE 209	Fluid Mechanics	Basic	✓	✓			✓		
	MTE 210	Mechanics of Materials	Basic	✓		✓				
	MTE 211	Digital Logic Design	Basic	✓	✓	✓		✓	✓	
	MTE 212	Statistics	Basic	✓	✓					✓
	MTE 213	Signals and Systems	Basic	✓	✓				✓	
	UOM 2032	Computer2	Basic	✓	✓			✓		
	UOM 2012	Arabic language2	Basic							
<b>Third</b>	MTE 301	Measurement and Instrumentation	Basic	✓	✓	✓		✓		
	MTE 302	Control System	Basic	✓	✓	✓			✓	
	MTE 303	Signal Processing	Basic	✓	✓			✓	✓	✓
	MTE 304	Microprocessors & Assembly Language	Basic	✓	✓	✓				
	MTE 305	Mechanical Engineering Laboratory	Basic	✓		✓		✓	✓	
	MTE 306	Theory of Machines	Basic	✓	✓			✓	✓	
	MTE 307	Heat Transfer	Basic	✓	✓				✓	✓
	MTE 308	Hydraulic & Pneumatic Systems	Basic	✓	✓		✓	✓		
	MTE 309	Computer Aided Machine Design I	Basic	✓	✓		✓	✓	✓	✓
	MTE 310	Microcontroller System Design	Basic	✓	✓	✓		✓	✓	
	MTE 311	Numerical Methods	Basic	✓				✓		
	MTE 312	Power Electronics and Drive	Basic	✓	✓	✓		✓	✓	
<b>Fourth</b>	MTE 401	Communication and Networking Engineering	Basic	✓	✓			✓	✓	✓
	MTE 402	Digital Control Systems	Basic	✓	✓	✓			✓	
	MTE 403	Artificial intelligent	Basic	✓	✓				✓	✓
	MTE 404	Image Processing	Basic	✓		✓		✓	✓	
	MTE 405	Industrial Automation I	Basic	✓	✓	✓				
	MTE 406	Design of Mechatronics System	Basic	✓	✓	✓		✓		

MTE 407	Robotics I	Basic	✓	✓	✓		✓	✓	
MTE 408	Project I	Basic							
MTE 409	Intelligent Control	Basic	✓	✓	✓			✓	
MTE 410	Engineering Management	Basic	✓	✓				✓	
MTE 411	Special Topics in Mechatronics	Basic	✓	✓	✓		✓	✓	✓
MTE 412	Industrial Automation II	Basic	✓	✓	✓				
MTE 413	Robotics II	Basic	✓	✓	✓		✓	✓	
MTE 414	Project II	Basic							
MTE 415	Computer Interfacing	Basic	✓	✓	✓				
MTE 416	Statistic II	Basic							

## Study Courses of the Department of Mechatronics Engineering / College of Engineering / University of Mosul

### First Level / Bologna Process Track

Semester	No.	Module Code	Module Name In English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSW L hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semin (hr/w)							
One	1	UCOM 1021	English Language I	اللغة الانكليزية 1	English	2						3	33	17	50	2.00	S	
	2	MTE 102	Mathematics I	الرياضيات I	English	4						3	63	87	150	6.00	B	
	3	MTE 103	Physics I	فيزياء I	English	2		2				3	63	87	150	6.00	B	
	4	MTE 104	Engineering Drawing & AutoCAD	الرسم الهندسي والرسم بواسطة الكمبيوتر	English			4				3	63	62	125	5.00	B	
	5	UCOM 1031	Computer I	الحاسوب	English	1		2				3	48	27	75	3.00	B	
	6	MTE 106	Electrical Circuits Analysis I	تحليل الدوائر الكهربائية I	English	2		2		1		3	78	72	150	6.00	C	
	7	UCOM 1040	Democracy and Human Rights	الديمقراطية وحقوق الانسان	Arabic	2						3	33	17	50	2.00	S	
					Total	13	0	10	0	1	0	21	381	369	750	30.00		
Two	1	UCOM 1011	Arabic language I	اللغة العربية 1	Arabic	2						3	33	17	50	2.00	S	
	2	MTE 109	Mathematics II	الرياضيات II	English	4						3	63	62	125	5.00	B	
	3	MTE 110	Engineering Mechanics-Statics I	الميكانيكا الهندسية - الساكنة	English	3	1			1		3	78	47	125	5.00	B	
	4	MTE 111	Computer Programming	برمجة الحاسوب	English	2		2				3	63	62	125	5.00	B	
	5	MTE 112	Manufacturing Processes	عمليات التصنيع	English	2		2				3	63	37	100	4.00	C	
	6	MTE 113	Electrical Circuits Analysis II	تحليل الدوائر الكهربائية II	English	2		2		1		3	78	47	125	5.00	C	MTE 106
	7	MTE 114	Physics II	الفيزياء 2	English	2				1		3	48	52	100	4.00	B	
					Total	17	1	8	0	3	0	21	426	324	750	30.00		

1. Course Name:	
<b>English language1</b>	
2. Course Code:	
UOM 1021	
3. Semester / Year:	
First Semester 2025-2026	
4. Description Preparation Date:	
1-9-2025	
5. Available Attendance Forms:	
CL Class (Lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
33hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
Name: Dr. Mohammed Yaseen	
Email: <a href="mailto:mohammed.alnuaimi@uomosul.edu.iq">mohammed.alnuaimi@uomosul.edu.iq</a>	
8. Course Objectives	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• Develop students' general English language skills in reading, writing, listening, and speaking.</li> <li>• Help students understand the fundamental principles of English as a foreign language.</li> <li>• Introduce key beginner-level grammar structures and essential vocabulary for first-year undergraduate study.</li> <li>• Enable students to construct grammatically accurate simple sentences in affirmative, negative, and interrogative forms.</li> <li>• Build a solid foundation for further English learning and future engineering communication.</li> </ul>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<ul style="list-style-type: none"> <li>• Class lectures are used to explain grammar, vocabulary, reading passages, and communication functions.</li> <li>• Tutorial sessions are used for guided practice, grammar exercises, short conversations, and sentence-building activities.</li> <li>• A communicative approach is adopted through pair work, role-play, questions and answers, and classroom discussion.</li> <li>• Reading, listening, speaking, and writing tasks are integrated to reinforce language acquisition.</li> <li>• Continuous feedback, quizzes, assignments, and short written/oral activities are used to monitor student progress.</li> </ul>

## 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Use basic greetings and the verb to be in simple introductions.	Unit 1: Hello — am/are/is; my/your; this is; practice in work contexts.	Theoretical lectures	Participation and short exercises
2	2	Use subject pronouns, possessive adjectives, and basic question forms.	Unit 2: Your world — he/she/they; his/her; questions.	Theoretical lectures	Assignment / exercises
3	2	Exchange personal information and use simple social expressions.	Unit 3: All about you — personal information and social expressions.	Theoretical lectures	Oral practice / short quiz
4	2	Use possession, have/has, and adjective + noun patterns correctly.	Unit 4: Family and friends — possessive adjectives; possessive 's; have/has; adjective + noun.	Theoretical lectures	Classwork and exercises
5	2	Construct present simple sentences with I/we/you/they and use articles.	Unit 5: The way I live — present simple I/we/you/they; a/an; adjective + noun.	Theoretical lectures	Quiz 1
6	2	Use present simple with he/she and form negatives and questions.	Unit 6: Every day — present simple he/she; negatives and questions; adverbs of frequency.	Theoretical lectures	Exercises / homework
7	2	Review and demonstrate understanding of Units 1–6.	Midterm examination and revision of key grammar and vocabulary.	Revision + exam	Midterm Exam
8	2	Use question words, demonstratives, there is/there are, and prepositions.	Units 7–8: My favourites; Where I live — question words; pronouns; this/that; there is/are; prepositions.	Theoretical lectures	Classwork / oral practice
9	2	Recognise and use was/were and irregular past simple verbs.	Unit 9: Times past — was/were born; past simple and irregular verbs.	Theoretical lectures	Exercises / homework
10	2	Form past simple affirmative, negative, and question structures.	Unit 10: We had a great time — regular and irregular verbs; questions; negatives; ago.	Theoretical lectures	Quiz 2

11	2	Use can/can't, adverbs, and polite requests.	Unit 11: I can do that! — can/can't; adverbs; requests.	Theoretical lectures	Oral/written activity
12	2	Use would like, some/any, and expressions for offers and requests.	Unit 12: Please and thank you — I'd like; some/any; like and would like.	Theoretical lectures	Assignment
13	2	Distinguish between present simple and present continuous in context.	Unit 13: Here and now — present continuous; present simple versus present continuous.	Theoretical lectures	Report / written task
14	2	Use basic future forms and write a simple email or information letter.	Unit 14: It's time to go! — future; writing an email and an information letter.	Theoretical lectures	Writing task / feedback
15		Review course content and prepare for the final examination.	General revision of grammar, vocabulary, communication functions, and writing tasks.	Revision	Comprehensive review

### 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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	2	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	John Soars and Liz Soars, New Headway Beginner, 4th edition, Oxford University Press.
Main references (sources)	New Headway Beginner Student's Book and Workbook, Oxford University Press, 4th edition.
Recommended books and references (scientific journals, reports...)	Supplementary beginner-level English grammar and vocabulary materials suitable for undergraduate students.
Electronic References, Websites	Oxford University Press English Language Teaching resources; British Council LearnEnglish resources.

1. Course Name:					
<b>Mathematics I</b>					
2. Course Code:					
<b>MTE 102</b>					
3. Semester / Year:					
First semester 2025-2026					
4. Description Preparation Date:					
1-9-2025					
5. Available Attendance Forms:					
CL Class (Lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Mustafa Salim Mustafa					
Email: mssae@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• Understand the techniques of graphic function and finding the area and the volume generated by revolving the function about the any axis's, [I, II, IV, VII]</li> <li>• Gain knowledge about the techniques of differentiation and integration, [I, VI]</li> <li>• Gain an ability to apply the techniques of differentiation and integration to any type of physical problem, [I, VI]</li> <li>• Polar Coordinates, Graphing in Polar Coordinates [I, VI]</li> </ul>				
9. Teaching and Learning Strategies					
<b>Strategy</b>	Theoretical lectures Discussion sessions				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
<b>Week1</b>	4	I, VI, VII	Techniques of Indefinite Integration; Definite Integrals; Properties of Definite Integrals	1+2	HW + Seminar + Midterm
<b>Week2</b>	4	I, VI	Solids of Revolution; Volume of Cylindrical Shell & Cross Section	1+2	HW + CW + midterm
<b>Week3</b>	4	I, VI	Solids of Revolution; Volume of Cylindrical Shell & Cross Section	1+2	HW + CW + midterm

<b>Week4</b>	4	I, VI	Arc Length; Surface of Revolution; Center of Mass	1+2	HW + CW + midterm
<b>Week5</b>	4	I, VI	Integration of Transcendental Functions	1+2	HW + CW + Seminar + midterm
<b>Week6</b>	4	I, VI	Indeterminate Forms and L' Hopital; Rule.	1+2	HW + CW + midterm
<b>Week7</b>	4	I, VI	Midterm exam	1+2	HW + CW + midterm
<b>Week8</b>	4	I, VI, VII	Basic Integration Formulas, Integration by Parts	1+2	HW + CW + midterm
<b>Week9</b>	4	I, VI	Trigonometric Integrals	1+2	HW + CW + midterm
<b>Week10</b>	4	I, VI,	Integrals of Rational Functions	1+2	HW + CW + midterm
<b>Week11</b>	4	I, VI	Integrals Partial Fractions	1+2	HW + CW + midterm
<b>Week12</b>	4	I, VI	Polar Coordinates	1+2	HW + CW + midterm
<b>Week13</b>	4	I, VI	Graphing in Polar Coordinates	1+2	HW + CW + midterm
<b>Week14</b>	4	I, VI	Graphing in Polar Coordinates	1+2	HW + CW + midterm
<b>Week15</b>	4	I, VI	Review	1+2	HW + CW + midterm

### 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

Assessment Type	Number / Duration	Marks
<b>Quizzes</b>	2	10% (10 Marks)
<b>Assignments</b>	5	10% (10 Marks)
<b>Project / Lab</b>	1	10% (10 Marks)
<b>Report</b>	1	10% (10 Marks)
<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	George Thomas Jr., Maurice Weir, Joel Hass, Thomas' Calculus: Early Transcendentals, Pearson, 13th Edition, October 8, 2013
Main references (sources)	Richard Courant and Fritz John, Introduction to Calculus and Analysis, Vol. 1, Springer; 1999th edition, December 3, 1998.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	<a href="https://www.coursera.org/learn/differentiation-calculus">https://www.coursera.org/learn/differentiation-calculus</a>

1. Course Name:					
<b>Physics I</b>					
2. Course Code:					
<b>MTE 103</b>					
3. Semester / Year:					
First semester 2025-2026					
4. Description Preparation Date:					
1-9-2025					
5. Available Attendance Forms:					
CL Class (Lecture), LAB (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
<b>63 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).</b>					
7. Course administrator's name					
Name: Rwaal Talal Abdullah Email: rwaal.abdallah@uomosul.edu.iq Name: Zahraa Reyad Mahmood Email: Zahraa.reyad@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• This module is designed to develop a detailed understanding of the uses and limitations of common engineering materials and processes.</li> <li>• Surface and material treatments will be discussed and how these processes change the base material property.</li> <li>• The overall modules aim is to enable students to relate materials choices to product and process design requirements.</li> </ul>				
9. Teaching and Learning Strategies					
<b>Strategy</b>	<p>Tools and strategies, in addition to the student – teacher interaction in – and – off class, used to deliver the course to the students are basically divided upon the following:</p> <ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Lab works.</li> <li>3. Assignments.</li> </ol>				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week1	4	I, VI	Introduction and some basic definitions	Lectures	Assignments
Week2	4	I, VI	Basic Concepts	Lectures	Assignments
Week3	4	I, VI	Physical and Mechanical properties of materials:	Lectures	Assignments

Week4	4	I, VI	Fundamental tests I (Tensile Test)	Lecture + Practical Lab	Reports
Week5	4	I, VI	Fundamental tests II (Compression Test)	Lecture + Practical Lab	Reports
Week6	4	I, VI	Fundamental tests III (Impact Test)	Lecture + Practical Lab	Reports
Week7	4	I, VI	Fundamental tests III (Hardness Test)	Lecture + Practical Lab	Reports
Week8	4	I, VI	Midterm Exam	Exam and Projects Discussion	
Week9	4	I, VI	Engineering materials	Lectures + Discussion	Assignments
Week10	4	I, VI	Steels and cast iron	Lectures + Discussion	Assignments
Week11	4	I, VI	Aluminum and their Alloys	Lectures + Discussion	Assignments
Week12	4	I, VI	Copper and their Alloys	Lectures + Discussion	Assignments
Week13	4	I, VI	polymers and ceramics	Lectures + Discussion	Assignments
Week14	4	I, VI	Composite Materials and advanced materials	Lectures + Discussion	Assignments
Week15	4	I, VI	Material Selection	Lectures + Discussion	Assignments

### 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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Materials Science and Engineering: An Introduction – William D. Callister Jr. and David G. Rethwisch.
Main references (sources)	Engineering Materials 1: An Introduction to Properties, Applications and Design – Michael F. Ashby and David R. H. Jones
Recommended books and references (scientific journals, reports...)	ASM Handbook, Volume 20: Materials Selection and Design – ASM International.

	ASM Handbooks Online – ASM International. Engineered Materials Handbook, Desk Edition – ASM International.
Electronic References, Websites	<a href="https://dl.asminternational.org/handbooks?utm_source=chatgpt.com">https://dl.asminternational.org/handbooks?utm_source=chatgpt.com</a>

1. Course Name:					
Engineering Drawing & AutoCAD					
2. Course Code:					
MTE 104					
3. Semester / Year:					
First semester 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
Laboratory					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Zaid Ayad Sedeeq Email: Zaid.ayad@uomosul.edu.iq Name: Zahraa Reyad Mahmood Email: Zahraa.reyad@uomosul.edu.iq					
8. Course Objectives					
<ul style="list-style-type: none"> <li>• Describe the principles of AutoCAD.</li> <li>• Describe the important tools in AutoCAD.</li> <li>• Explaining two-dimensional drawings in AutoCAD</li> <li>• Training on drawing basic geometric shapes using AutoCAD.</li> <li>• Learn advanced instructions while doing advanced exercises using AutoCAD.</li> <li>• Do many advanced exercises to design engineering machine parts.</li> </ul>					
9. Teaching and Learning Strategies					
<b>Strategy</b>		<ol style="list-style-type: none"> <li>1. Computer laboratories</li> <li>2. Discussion sessions</li> <li>3. Homework and classwork</li> <li>4. Exams</li> </ol>			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I	Teaching the basics of AutoCAD Basic settings, change the color, show the command bar, the command line, and convert the line to a center line or a hidden line	Computer laboratory	Discussion
2	4	I	This lecture contains line and polyline drawing commands	Computer laboratory	Discussion
3	4	I	The circle of the circle is the arc of the arc and the drawing	Computer laboratory	Quiz

			of the tangent, the inner arc and the outer arc		
4	4	I	This lecture contains drawing commands Polygonal Ellipse Rectangle (Pentagonal & Hexagonal & etc....)	Discussion	Quiz
5	4	I	This lecture includes dimensions and how to make it fit with the drawing and change the size and color This lecture includes on Hatch commands	Computer laboratory	Discussion
6	4	I, VII	This lecture includes Modify in modification commands	Computer laboratory	Assignment
7	4	I	Mid-term	Mid-Term exam	Exam
8	4	I	This lecture includes the object of snap	Computer laboratory	Discussion
9	4				I, VII
10	4	I, VII	Solving engineering operations in AutoCAD	Computer laboratory	Quiz
11	4				Discussion
12	4		Solve examples	Computer laboratory	Discussion
13	4	I	Solve examples	Computer laboratory	Discussion
14	4	I	This lecture includes Drawing projections in AutoCAD	Computer laboratory	Discussion
15		I	Final exam	Final 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	%10
Report	5	%10
Mid-Term	1	%10
Homework	1	%10
Classwork	2 hr	%10
Final exam	3 hr	%50
Total		%100

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Dennis E. Maguire, "Engineering Drawing from First Principles Using AutoCAD", 1st Edition Butterworth..Heinemann, (Can be downloaded from the Course web page). Kendrol Philips, "AutoCAD Beginners Guide 2D and 3D Drawings", (Can be downloaded from the Course web page).
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	<p>Lee Ambrosius and David Byrnes"AutoCAD AutoCAD LT A in One Desk Reference for Dummies", Wiley Publishing 2006 (Can be downloaded from the Course web page).</p> <p>Dennis E. Maguire,“Engineering Drawing from First Principles Using AutoCAD”, 1st Edition Butterworth..Heinemann, (Can be downloaded from the Course web page).</p> <p>Kendrol Philips,“ AutoCAD Beginners Guide 2D and 3D Drawings”, (Can be downloaded from the Course web page).</p> <p>Lee Ambrosius and David Byrnes"AutoCAD AutoCAD LT A in One Desk Reference for Dummies", Wiley Publishing 2006 (Can be downloaded from the Course web page).</p>
Main references (sources)	WilliamD.CallisterJr.& David D.Rethwisch.(2010)"Material Science and Engineering An introduction", eightEdition
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	<a href="https://help.autodesk.com/view/ACD/2022/ENU/">https://help.autodesk.com/view/ACD/2022/ENU/</a>

1. Course Name:					
<b>Computer I</b>					
2. Course Code:					
<b>UOM 1031</b>					
3. Semester / Year:					
<b>First Semester / 2025-2026</b>					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Lab (Lab Sheets)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
48 hr/sem (SSWL: Structured Student Workload) / 3 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Dr. Mohammed Falah Mohammed Email: Mohammed.falah_kanna@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>		<p><b>Aligned with GO III &amp; GO VI</b></p> <p><b>1. Apply Computer Applications in Practical Tasks (GO III)</b> Enable students to use productivity software (word processing, spreadsheets, and presentation tools) to create, format, and present professional documents for academic and engineering purposes.</p> <p><b>2. Perform Data Processing and Basic Analysis (GO III)</b> Develop students' ability to organize, analyze, and visualize data using spreadsheet tools to support problem-solving tasks.</p> <p><b>3. Develop Independent Learning Skills in Emerging Technologies (GO VI)</b> Encourage students to explore and learn new and recent technology topics independently through research and digital tools.</p> <p><b>4. Demonstrate Adaptability and Creative Use of Digital Tools (GO VI)</b> Enable students to independently explore and apply both learned and new features of software tools (e.g., Microsoft Office) to design creative outputs such as brochures and magazine-style documents, demonstrating self-learning, innovation, and adaptability beyond classroom instruction.</p>			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Theoretical lectures 2-Discussion sessions 3-Projects			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
<b>Week 1</b>	3	III, VI	Introduction to Computer: Concepts of Hardware and Software with their components; Concept of	Theoretical lectures and Lab	Discussion

			Computing, Data and Information; Applications of Information Electronics and Communication Technology (IECT); Connecting input/output devices, and peripherals to CPU.		
<b>Week 2, 3</b>	3	III, VI	Computer Components: Computer Portions. Hardware Parts, I/O Units, Memory Types, Basic CPU Components, Computer Ports, Personal Computer, Personal Computer (Features and Types)	Theoretical lectures and Lab	Discussion
<b>Week 4, 5</b>	3	III, VI	Operating System and Graphical User Interface GUI: Operating System; Basics of Common Operating Systems; The User Interface, Using Mouse Techniques; Use of Common Icons, Status Bar, Using Menu and Menu-selection, Concept of Folders and Directories, Opening and closing of different Windows; Creating Short cuts.	Theoretical lectures and Lab	Quiz + 2 Reports
<b>Week 6,7</b>	3	III, VI	Word Processing: Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.	Theoretical lectures and Lab	Quiz + 2 Reports
<b>Week 8</b>	3		Midterm Exam		Exam
<b>Week 9, 10,11</b>	3	III, VI	Spread Sheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.	Theoretical lectures and Lab	Lab Assessment
<b>Week 12</b>	3	III, VI	Presentation Software: Basics of presentation software; Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation/handouts.	Theoretical lectures and Lab	Discussion
<b>Week 13</b>	3	VI	Introduction to Internet and Web Browsers: Computer networks Basic; LAN, WAN; Concept of Internet and its	Theoretical lectures	Discussion

			Applications; connecting to internet; World Wide Web; Web Browsing software's, Search Engines; Understanding URL; Domain name; IP Address.		
<b>Week 14</b>	3	VI	Communications and Emails: Basics of electronic mail; Getting an email account: Sending and receiving emails: Accessing sent emails, Using Emails; Document collaboration.	Theoretical lectures	Discussion
<b>Week 15</b>	3	VI	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.	Theoretical lectures	Research + Report
<b>Week 16</b>	3		<b>Preparatory week before the final Exam</b>	Theoretical lectures	Discussion
<b>Week 17</b>			Final Exam.		Final exam

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
<b>Quizzes</b>	2	10% (10 Marks)
<b>Lab Reports</b>	5	10% (10 Marks)
<b>Lab Assessment</b>	1	10% (10 Marks)
<b>Mini Project</b>	1	10% (10 Marks)
<b>Midterm Exam</b>	1 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	2015 Computer Literacy BASICS: A Comprehensive Guide to IC3 Connie Morrison, Dolores Wells, Lisa Ruffolo Cengage Learning. ISBN: 128576658X
Main references (sources)	Sardar Azeem. (2024). <i>Microsoft Office: OAC all in one</i> . Compiled for DIT (Diploma in Information Technology), KPK, Pakistan.
Recommended books and references (scientific journals, reports...)	IC3 GS5 Certification Guide Using Windows 10 & Office 2016
Electronic References, Websites	

<b>1. Course Name:</b>	
<b>Electrical Circuits Analysis I</b>	
<b>2. Course Code:</b>	
MTE 106	
<b>3. Semester / Year:</b>	
First semester 2025/2026	
<b>4. Description Preparation Date:</b>	
1/9/2025	
<b>5. Available Attendance Forms:</b>	
CL (class lecture), Tut (Tutorial), Lab (Laboratory)	
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>	
<b>78 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).</b>	
<b>7. Course administrator's name</b>	
Name: Sayf A. Majeed Email: <a href="mailto:sayf@uomosul.edu.iq">sayf@uomosul.edu.iq</a>	
<b>8. Course Objectives</b>	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• <b>Understanding Fundamental Concepts:</b> Provide students with a solid understanding of fundamental concepts in electrical circuit analysis. <b>(GO1).</b></li> <li>• <b>Analysis Methodologies:</b> Students will learn a variety of analysis methods to solve DC circuits, including Kirchhoff's laws and series and parallel circuit analysis. They will gain proficiency in nodal and mesh analysis methods, enabling them to analyze complex circuits systematically. <b>(GO1).</b></li> <li>• <b>Circuit Simplification:</b> Provide students with the skills necessary to use methods like Thevenin's and Norton's theorems to simplify complicated DC circuits and find the equivalent circuits. <b>(GO1).</b></li> <li>• <b>Problem Solving Skills:</b> The course aims to develop problem-solving skills through hands-on activities and problem-solving exercises. <b>(GO1).</b></li> <li>• <b>Laboratory Experience:</b> The course aims to provide hands-on laboratory experiences where students can apply theoretical knowledge to practical scenarios. <b>(GO3).</b></li> <li>• <b>Preparation for Advanced Courses:</b> Prepare students for more advanced courses. A solid understanding of this course is essential in electronics, signal processing, control systems, and other specialized areas. <b>(GO1).</b></li> </ul>
<b>9. Teaching and Learning Strategies</b>	
<b>Strategy</b>	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the discussion, while at the same time refining and expanding their critical thinking skills. This will be achieved through:</p> <ol style="list-style-type: none"> <li>1. Active Learning: Encourages students to participate in the learning process through discussions, group projects, practical experiments, and problem-solving exercises.</li> <li>2. Interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</li> </ol>

3. Gamification: in order to increase motivation and engagement in the learning process, game elements will be incorporated, such as competition, rewards, and challenges.

### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	5 hrs	GO1 and GO3	Review the Course MTE 106, Discuss the Syllabus, Introduction to Systems of Units	Class lecture + LABs	Class participation + Labs Task
Week 2	5 hrs	GO1 and GO3	Circuit Concepts - Passive and Active Elements, Voltage-Current Relations, and Circuit Diagrams	Class lecture + LABs	Assignments 1 + Labs Task
Week 3	5 hrs	GO1 and GO3	Nodes, Branches, Loops, and Ohm's Law in the DC Network	Class lecture + LABs	Quiz 1 + Labs Task
Week 4	5 hrs	GO1 and GO3	Independent and Dependent sources	Class lecture + LABs	Class work + Labs Task
Week 5	5 hrs	GO1 and GO3	Kirchhoff's Laws: KVL and KCL	Class lecture + LABs	Class work + Labs Task
Week 6	5 hrs	GO1 and GO3	Series and Parallel Resistors	Class lecture + LABs	Quiz 2 + Labs Task
Week 7	5 hrs	GO1 and GO3	Mid-term Exam + Voltage and Current Division	Class lecture + LABs	Midterm exam
Week 8	5 hrs	GO1 and GO3	Nodal Analysis, and Super node	Class lecture + LABs	Class work + Labs Task
Week 9	5 hrs	GO1 and GO3	Mesh Analysis, and Super mesh	Class lecture + LABs	Class work + Labs Task
Week 10	5 hrs	GO1 and GO3	Source Transformations	Class lecture + LABs	<b>Assignments 2</b> + Labs Task
Week 11	5 hrs	GO1 and GO3	Star (Wye)-Delta Transformations	Class lecture + LABs	Class work + Labs Task
Week 12	5 hrs	GO1 and GO3	Linearity and Superposition Theorems	Class lecture + LABs	Class work + Labs Task
Week 13	5 hrs	GO1 and GO3	Thévenin's and Norton Theorems	Class lecture + LABs	Quiz 3 + Labs Task
Week 14	5 hrs	GO1 and GO3	Maximum Power Transfer Theorem	Class lecture + LABs	Report + Labs Task
Week 15	5 hrs	GO1 and GO3	Review, Practice	Revision lecture + discussion	Class participation + Labs Task
Week 16	3 hrs	GO1 and GO3	The final Exam	The final Exam	Final exam

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	12% (10 Marks)
Assignments	2	8% (8 Marks)
Project / Lab	5	15% (15 Marks)
Report	1	5% (5 Marks)

<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education
Main references (sources)	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education
Recommended books and references (scientific journals, reports...)	DC Electrical Circuit Analysis: A Practical Approach
Electronic References, Websites	<a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a>

1. Course Name:					
<b>Democracy and human rights</b>					
2. Course Code:					
<b>UOM 1040</b>					
3. Semester / Year:					
First semester 2025-2026					
4. Description Preparation Date:					
1-9-2025					
5. Available Attendance Forms:					
CL Class (Lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
<b>33 hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Transfer and Accumulation System).</b>					
7. Course administrator's name					
Name: Abdullah Fathi Ahmed					
Email: <a href="mailto:abdulla.fathi@uomosul.edu.iq">abdulla.fathi@uomosul.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• <b>Understanding and Cognition of Human Rights:</b> Developing a deep understanding and awareness of the rights bestowed by God Almighty upon all human beings; these are inherent gifts, not privileges granted by anyone, and no individual has the right to strip them away.</li> <li>• <b>Personal Expression and Advocacy:</b> Enabling the student to express these rights in their own style and develop the ability to defend and advocate for them.</li> <li>• <b>Analysis of Violations:</b> Reasoning and providing explanations for contemporary phenomena and incidents involving human rights violations encountered by the student.</li> <li>• <b>Identifying Gaps and Deficiencies:</b> Identifying shortcomings and gaps in current practices or systems based on the information provided within the curriculum.</li> </ul>				
9. Teaching and Learning Strategies					
<b>Strategy</b>	<p><b>In-person Education:</b> Conducted through the following teaching methodologies:</p> <ul style="list-style-type: none"> <li>• <b>Lecturing</b></li> <li>• <b>Discussion</b></li> <li>• <b>Brainstorming</b></li> <li>• <b>Problem-Solving</b></li> <li>• <b>Report Assignments</b> (Assigning students to prepare academic reports)</li> </ul> <p><b>E-Learning Support:</b> Facilitated via the <b>Google Classroom</b> platform, which included:</p> <ul style="list-style-type: none"> <li>• Assigning students <b>homework</b> and digital tasks.</li> </ul>				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week1	2	<b>Define an introductio</b>	<b>Introduction: The Concept of Human Rights</b>	Theoretical classroom lecture	

		<b>n to human rights.</b>			
<b>Week2</b>	2	<b>Define the linguistic and terminology meaning of "Right".</b>	<b>Definition of "Right"</b>	Theoretical classroom lecture	
<b>Week3</b>	2	<b>Define the concept of "Human".</b>	<b>Definition of "Human"</b>	Theoretical classroom lecture	
<b>Week4</b>	2	<b>Understand the concept of legal personality and its characteristics.</b>	<b>Legal Personality and its Characteristics</b>	Theoretical classroom lecture	<b>Daily Quiz + Assignment</b>
<b>Week5</b>	2	<b>List the historical development of rights and freedoms.</b>	<b>Historical Development of the Concept of Rights and Freedoms</b>	Theoretical classroom lecture	
<b>Week6</b>	2	<b>Identify Eastern freedoms.</b>	<b>Rights and Freedoms in Eastern Civilizations</b>	Theoretical classroom lecture	
<b>Week7</b>	2	<b>Identify Western freedoms.</b>	<b>Rights and Freedoms in Western Civilizations</b>	Theoretical classroom lecture	
<b>Week8</b>	2	<b>Define rights during the Middle Ages.</b>	<b>Historical Development of the Idea of Rights in the Middle Ages</b>	Theoretical classroom lecture	<b>Midterm Exam</b>
<b>Week9</b>	2	<b>List the divine religions and their perspectives on rights.</b>	<b>Rights and Freedoms in Divine Religions</b>	Theoretical classroom lecture	
<b>Week10</b>	2	<b>Define rights in Christianity.</b>	<b>Rights and Freedoms in Christianity</b>	Theoretical classroom lecture	
<b>Week11</b>	2	<b>Understand rights and freedoms in Islam.</b>	<b>Rights and Freedoms in Islam</b>	Theoretical classroom lecture	Daily Quiz
<b>Week12</b>	2	<b>Discuss human rights through the</b>	<b>Evolution of the Human Rights Concept</b>	Theoretical classroom lecture	Homework

		modern era.	through the Modern Era		
Week13	2	List modern trends in rights and freedoms.	Review and Discussion	Theoretical classroom lecture	
Week14	2	Define an introduction to human rights.	Modern Trends in Rights and Freedoms	Theoretical classroom lecture	
Week15	2	Define the linguistic and terminology meaning of "Right".	Report Discussion	Theoretical classroom lecture	Report Discussion

### 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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Human Rights, Democracy, and Public Freedoms, the approved methodological textbook for university students, Ministry of Higher Education and Scientific Research.
Main references (sources)	Human Rights and Public Freedoms. Human Rights between Islamic Sharia and International Law.
Recommended books and references (scientific journals, reports...)	1. Universal Declaration of Human Rights – United Nations, 1948. 2. International Covenant on Civil and Political Rights – United Nations, 1966. 3. International Covenant on Economic, Social and Cultural Rights – United Nations, 1966. 4. Constitution of the Republic of Iraq of 2005, particularly the chapter on rights and freedoms.
Electronic References, Websites	1 .United Nations Human Rights website. 2 .Office of the United Nations High Commissioner for Human Rights website. 3 .United Nations Human Rights Council website. 4 .Amnesty International website.

1. Course Name:					
<b>Arabic Language I</b>					
2. Course Code:					
<b>UOM 1011</b>					
3. Semester / Year:					
Second semester 2025-2026					
4. Description Preparation Date:					
1-9-2025					
5. Available Attendance Forms:					
CL Class (Lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
<b>33 hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Transfer and Accumulation System).</b>					
7. Course administrator's name					
Name: manal ayad					
Email: manal.a.a@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>	The latest educational materials for students focus on listening and speaking skills.				
	Correct writing in clear and correct language is also emphasized, along with guiding students through the moral values contained in texts, whether they are blessed Quranic verses or poetic examples.				
9. Teaching and Learning Strategies					
<b>Strategy</b>	1. Lectures				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
<b>Week1</b>	2	Learning Quranic texts, Prophetic hadiths, and poetic examples	Surah Yusuf(4-1) The Noble Prophetic Hadith: Do not envy one another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week2</b>	2	Conjugation of nouns in terms of gender (masculine and feminine), and signs of femininity.	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests

<b>Week3</b>	2	Numbers, their rules, and their divisions	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests Written and oral tests
<b>Week4</b>	2	The concept of dependents and the ruling on dependents	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week5</b>	2	The concept of adjectives and their types	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week6</b>	2	The concept of emphasis and its types	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week7</b>	2	The concept of adjectives and their types	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week8</b>	2	Introduction to Arabic dictionaries and lexicographical schools	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests Written and oral tests Written and oral tests
<b>Week9</b>	2	Definition of rhetoric Introduction to the science of rhetoric and its divisions	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week10</b>	2	Introduction to semantic embellishments and antithesis Introduction to verbal embellishments and paronomasia	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week11</b>	2	Identifying the most common	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests

		grammatical errors			
<b>Week12</b>	2	Identifying the most common grammatical errors	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests Written and oral tests
<b>Week13</b>	2	Identifying the most common linguistic errors	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week14</b>	2	Identifying the most prominent morphological errors	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests
<b>Week15</b>	2	Exam	another, nor outbid one another.	Self-learning, then learning by doing	Written and oral tests

### 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

Assessment Type	Number / Duration	Marks
<b>Quizzes</b>	2	10% (10 Marks)
<b>Assignments</b>	5	10% (10 Marks)
<b>Project / Lab</b>	1	10% (10 Marks)
<b>Report</b>	1	10% (10 Marks)
<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Clear Grammar, Arabic Language for Non-Specialized Sections
Main references (sources)	Ibn Aqil's Explanation: Fundamentals of Arabic Grammar and Application
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Mathematics II</b>					
2. Course Code:					
<b>MTE 109</b>					
3. Semester / Year:					
<b>Second semester 2025-2026</b>					
4. Description Preparation Date:					
<b>1-9-2025</b>					
5. Available Attendance Forms:					
CL Class (Lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Mustafa Salim Mustafa E-mail: <a href="mailto:mssa@uomosul.edu.iq">mssa@uomosul.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>	<p>1) The successful Calculus I student should be able to apply the following competencies to a wide variety of functions, including piecewise, polynomial, rational, algebraic, trigonometric, inverse trigonometric, exponential, and logarithmic.</p> <p>2) Determine the existence of, estimate numerically and graphically, and find algebraically the limits of functions.</p> <p>3) Determine continuity at a point or on intervals and distinguish between the types of discontinuities at a point.</p> <p>4) Determine the derivative of a function using the limit definition. Interpret the derivative as the slope of a tangent line to a graph, the slope of a graph at a point, and the rate of change of a dependent variable with respect to an independent variable.</p> <p>5) Determine the derivative and higher derivatives of a function explicitly using differentiation formulas. And determine derivatives implicitly.</p> <p>6) Solve related rate problems. And determine absolute extrema for a continuous function on a closed interval. Use these and other appropriate techniques to solve optimization problems.</p> <p>7) For a given set of matrices, determine addition and multiplication using the rules.</p> <p>8) Determine the transpose, determinant, and Inverse of a matrix.</p> <p>9) Using Cramer's, Inverse, and Gauss elimination methods to solve the system of linear algebraic equations</p>				
9. Teaching and Learning Strategies					
<b>Strategy</b>	<p>1-Theoretical lectures</p> <p>2-Discussion sessions</p>				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	4	I, VI	Prerequisites for Calculus :Coordinates and Graphs in the Plane; Directions and Quadrants; Distance between Points; Graphs of Equations; Intercepts and More about Graphing; Slope and Equations for Lines; Slope of Non-vertical Lines; Lines That are Paralle	1 + 2	HW + CW
2	4	I, VI	Functions and Their Graphs: Domains and Ranges are Often Intervals; Even Functions and Odd Functions; Functions Defined in Pieces; How to Shift a Graph; Equations for Circles in the Plane; Equations for Parabolas.	1 + 2	HW + CW
3	4	I, VI	A Review of Trigonometric Functions: Radian Measure; The Six Basic Trigonometric Functions; Calculating Sines and Cosines; Graphs of Trigonometric Functions.	1 + 2	HW + CW
4	4	I, VI	Limits and Continuity: The Limit of a Function; The functions that haven't limits; The theories (1, 2, 3 to 6) of limit; Eliminating Common Factors from Zero Denominators; The Sandwich Theorem; $\sin(\theta)$ theorem; Limits Involving Infinity; Asymptot	1 + 2	HW + CW
5	4	I, VI	Continuous Functions; Continuity at a Point; Continuity Test; Properties of Continuous Functions; Inverse Functions and Continuity; composites of continuous functions; Limits of Continuous Functions.	1 + 2	HW + CW
6	4	I, VI	Derivatives: mathematical definition of the derivative; Tangents and the Derivative at a Point; ; Defining Slopes and Tangent Lines; The Derivative of a function; The Slope of Lines; Differentiation Rules; Integer Powers, Multiples, Sums, and Differences;	1 + 2	HW + CW
7	4	I, VI	Velocity, Speed, and Other Rate of Change such as acceleration and jerk; Derivatives of Trigonometric Functions such as Sine, Cosine and other Basic Functions; The Chain Rule; Integer Powers of Differentiable Functions; Derivative Formulas that Include th	1 + 2	HW + CW
8	4	I, VI	Implicit Differentiation and Fractional Powers; Lenses, Tangents, and Normal Lines; Using Implicit Differentiation to Find Derivatives of Higher Order; Fractional Powers of Differentiable Functions; Linear Approximations and Differentials.	1 + 2	HW + CW
9	4	I, VI	Applications of Derivatives: Related Rates of Change; Maxima, Minima, and the Mean Value Theorem; The First Derivative Theorem; The Mean Value Theorem; Curve Sketching with $y'$ and $y''$ ; Points of Inflection; Graphing with $y'$ and $y''$ .	1 + 2	HW + CW
10	4	I, VI	Graphing Rational Functions Asymptotes and Dominant Terms: Horizontal and Vertical Asymptotes; Oblique Asymptotes;	1 + 2	HW + CW

			Optimization; Applied Examples from Mathematics; Applied Examples from Industry.		
11	4	I, VI	Mid Exam : Matrices: Basic Definitions; Addition, Subtraction and Multiplication	1 + 2	HW + CW
12	4	I, VI	Transposition, Determinants and Inverse of a Matrix; System of Linear Algebraic Equation.	1 + 2	HW + CW
13	4	I, VI	Cramer's rule and Matrix inverse.	1 + 2	HW + CW
14	4	I, VI	Gauss elimination and Gauss-Jordan method.	1 + 2	HW + CW
15	4	I, VI	Final Exam.	1 + 2	HW + CW

1.

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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thomas' Calculus, George B. Thomas, Maurice D. Weir, and Joel Hass
Main references (sources)	Stewart, J., Calculus: Early Transcendentals.
Recommended books and references (scientific journals, reports...)	Anton, H., Bivens, I., and Davis, S., Calculus.
Electronic References, Websites	Thomas, G. B., Weir, M. D., and Hass, J., Thomas' Calculus.

1. Course Name:					
Engineering Mechanics (statics)					
2. Course Code:					
MTE 110					
3. Semester / Year:					
Second semester 2025-2026					
4. Description Preparation Date:					
1-9-2025					
5. Available Attendance Forms:					
CL Class (Lecture), Tut (Tutorial), Lect (Online lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
78 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Arshad yonus					
E-mail: <a href="mailto:arshad.ounis@uomosul.edu.iq">arshad.ounis@uomosul.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		1) Recognize various types of Forces, their components, and the function of each component [I, II]. 2) Identify the types of moments and the methods used to calculate them [II, III, IV]. 3) Distinguish between different types of frictional forces [II, III, IV, V]. 4) Familiarity with the position of equilibrium and the equations used in the subject [II, IV, V, VI]. 5) Identify the methods used to find the center of geometric shapes [II, VI].			
9. Teaching and Learning Strategies					
<b>Strategy</b>		<ul style="list-style-type: none"> <li>• Theoretical lectures</li> <li>• Discussion sessions</li> <li>• Assignments</li> <li>• Quizzes</li> </ul>			
10. Course Structure					
Wee k	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	I	Introduction – concept for the analysis method in engineering mechanic	Theoretical lectures	Discussion
2	5	I	Forces system	Theoretical lectures	Quiz
3	5	I	Resultant for forces	Theoretical lectures	Discussion

4	5	I	Moment for forces	Theoretical lectures	Assignment
5	5				
6	5	I	Couple moment	Theoretical lectures	Discussion
7	5				
8	5	I, II	Mid-term exam		Mid-term exam
9	5		Equilibrium of force	Theoretical lectures	Discussion
10	5				
11	5	I, II	Friction of force	Theoretical lectures	Assignment
12	5				
13	5	I, II, VI	Centroid of area	Theoretical lectures	Quiz
14	5				
15	5	I, II, IV, V, VI	Final exam		Final 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.

Assessment Type	Number / Duration	Marks
Quizzes	3	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Engineering Mechanics, STATICS , J. L. Meriam L. G. Kraige Virginia Polytechnic Institute and State University, 7th Edition,. Volume1.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>Engineering Mechanics: Statics 5th Edition by Anthony Bedford (Author), Wallace Fowler (Author).</li> <li>Vector Mechanics for Engineers: Statics, 12th Edition by Ferdinand Beer, E. Johnston, David Mazurek, Phillip Cornwell and Brian Self.</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
Computer Programming	
2. Course Code:	
MTE111	
3. Semester / Year:	
Second semester 2025-2026	
4. Description Preparation Date:	
1-9-2025	
5. Available Attendance Forms:	
CL Class (Lecture), lab(laboratory)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
Name: Dr. Zyad Mohammad Email : <a href="mailto:zmyousif@uomosul.edu.iq">zmyousif@uomosul.edu.iq</a>	
8. Course Objectives	
<b>Course Objectives</b>	<p>1. Advanced programming skills: students have a foundational understanding of programming, and learning C++ can enhance their skills and knowledge in advanced programming concepts, such as object- oriented programming and memory management. [I,II,III,VI,VII]</p> <p>2. Preparation for advanced courses: C++ is a widely used programming language in many advanced computer science courses, such as algorithms, data structures, and operating systems. Learning C++ can provide university students with a strong foundation for success in these courses. [I,II,III,VI,VII]</p> <p>3. Career opportunities: C++ is used in various industries, such as gaming, finance, and engineering, and learning C++ can provide university students with valuable skills that can lead to career opportunities. [I,II,III,VI,VII]</p> <p>4. Understanding of computer science concepts: Learning C++ can help students understand fundamental concepts in computer science, such as algorithms, data structures, and memory management, which are critical to success in advanced courses and future careers. [I,II,III,VI,VII]</p> <p>5.Improved problem-solving abilities: Programming requires a great deal of problem-solving and logical thinking, and learning C++ can help university students develop these skills, which are critical in various fields of computer science. [I,II,III,VI,VII]</p>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<ul style="list-style-type: none"> <li>• Theoretical lectures</li> <li>• Discussion sessions</li> <li>• Laboratory experiments</li> <li>• Computer laboratories</li> <li>• Projects</li> <li>• Industrial training</li> </ul>
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	4	[I,II,III,VI,VII]	Algorithms & Flowcharts	2+1	HW + Seminar + Midterm
Week 2	4	[I,II,III,VI,VII]	BASIC DATA TYPES IN C++ And program structure	2+1	HW + CW + midterm
Week 3	4	[I,II,III,VI,VII]	Numbering System	2+1	HW + CW + midterm
Week 4	4	[I,II,III,VI,VII]	if-else statements	2+1	HW + CW + midterm
Week 5	4	[I,II,III,VI,VII]	for Looping (Repetition) Structure	2+1	HW + CW + Seminar + midterm
Week 6	4	[I,II,III,VI,VII]	CONTROL STRUCTURES II (REPETITION II)	2+1	HW + CW + midterm
Week 7	4	[I,II,III,VI,VII]	Exam 1	2+1	HW + CW + midterm
Week 8	4	[I,II,III,VI,VII]	Functions	2+1	HW + CW + midterm
Week 9	4	[I,II,III,VI,VII]	Recursive Functions	2+1	HW + CW + midterm
Week 10	4	[I,II,III,VI,VII]	Two- and Multidimensional Arrays	2+1	HW + CW + midterm
Week 11	4	[I,II,III,VI,VII]	Arrays as Parameters to Functions	2+1	HW + CW + midterm
Week 12	4	[I,II,III,VI,VII]	Records (structs)	2+1	HW + CW + midterm
Week 13	4	[I,II,III,VI,VII]	Tutorial	1+2	HW + CW + midterm
Week 14	4	[I,II,III,VI,VII]	Exam 2	2+1	HW + CW + midterm
Week 15	4	[I,II,III,VI,VII]	General Review	2+1	HW + CW + midterm

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	C++ Programming from Problem Analysis to Program Design [5th Edition] book
Main references (sources)	· Archived lectures by specialist teacher for every paper or video material
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
Manufacturing Processes					
2. Course Code:					
MTE112					
3. Semester / Year:					
Second semester 2025-2026					
4. Description Preparation Date:					
1-9-2025					
5. Available Attendance Forms:					
CL Class (Lecture), lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 4 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Ahmad Wadollah S. Al-Sabawi					
Email: ahmadalsabawi@uomosul.edu.iq					
8. Course Objectives					
Course Objectives		<p>1. Link to GO I, II and VI Understand basic concepts of material machining and formation. Gain a quick information for the available engineering CAM packages those required for obtaining the suitable strategies for machining.</p> <p>2. Link GO II, III and V</p> <p>Exposed to the basic and available machining systems such as milling, turning, drilling, and grinding machines. Learn and gain engineering morals and ethics.</p>			
9. Teaching and Learning Strategies					
Strategy		<p>Theoretical lectures Discussion sessions Laboratory experiments</p>			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week1	4	I, II, III, V and VI	Basic concepts and definitions	Lectures	
Week2	4	I, II, III, V and VI	Mechanical properties of materials: Fundamental tests I (Tensile Test)	Lectures	Quiz
Week3	4	I, II, III, V and VI	Fundamental tests II (Compression Test and Impact Test)	Lectures	Hw
Week4	4	I, II, III, V and VI	Fundamental tests III (Hardness Test)	Lectures	Quiz

<b>Week5</b>	4	I, II, III, V and VI	Dimensions, measurements and measuring devices and Tolerances	Lectures	Hw
<b>Week6</b>	4	I, II, III, V and VI	Engineering materials Part I	Lectures	
<b>Week7</b>	4	I, II, III, V and VI	Engineering materials Part II	Lectures	
<b>Week8</b>	4	I, II, III, V and VI	Cutting theory	Lectures	
<b>Week9</b>	4	I, II, III, V and VI	Mid-Term Examination	Lectures	
<b>Week10</b>	4	I, II, III, V and VI	Material removal processes (Lathe and its related operations)	Lectures	
<b>Week11</b>	4	I, II, III, V and VI	Material removal processes (Boring and drilling)	Lectures	Quiz
<b>Week12</b>	4	I, II, III, V and VI	Material removal processes (Milling) 1	Lectures	Hw
<b>Week13</b>	4	I, II, III, V and VI	Material removal processes (Milling) 2	Lectures	
<b>Week14</b>	4	I, II, III, V and VI	Introduction to non – traditional machining	Lectures	
<b>Week15</b>	4	I, II, III, V and VI	Review	Lectures	
<b>Week16</b>		I, II, III, V and VI	Final 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

Assessment Type	Number / Duration	Marks
<b>Quizzes</b>	2	10% (10 Marks)
<b>Assignments</b>	5	10% (10 Marks)
<b>Project / Lab</b>	1	10% (10 Marks)
<b>Report</b>	1	10% (10 Marks)
<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Groover - Fundamentals of Modern Manufacturing- 5th 2013
Main references (sources)	Manufacturing Processes 2nd ed - H. N. Gupta et al. (New Age, 2009)
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	<a href="https://ocw.mit.edu/courses/2-007-design-and-manufacturing-i-spring-2009/">https://ocw.mit.edu/courses/2-007-design-and-manufacturing-i-spring-2009/</a>



1. Course Name:	
<b>Electrical Circuits Analysis II</b>	
2. Course Code:	
<b>MTE113</b>	
3. Semester / Year:	
Second semester 2025-2026	
4. Description Preparation Date:	
1-9-2025	
5. Available Attendance Forms:	
CL Class (Lecture), Laboratory, Tutorial	
6. Number of Credit Hours (Total) / Number of Units (Total)	
<b>78 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).</b>	
7. Course administrator's name	
Name: Dr. Sayf A. Majeed Email: sayf@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• <b>Understanding Fundamental Concepts:</b> Provide students with an understanding of the fundamental principles of AC circuits and their application in Mechatronics engineering. <b>(GO1).</b></li> <li>• <b>Analysis Methodologies:</b> Students will have a comprehensive understanding of AC circuits. They will become proficient in using complex impedance, and phasor techniques to address complex AC circuit problems. <b>(GO1).</b></li> <li>• <b>Circuit Simplification:</b> Students will learn how to simplify complex AC circuits and determine their equivalent circuits using advanced analysis theorems, such as Thevenin's and Norton's theorems <b>(GO1).</b></li> <li>• <b>Problem Solving Skills:</b> The course aims to develop design and problem-solving skills through hands-on activities and problem-solving exercises. <b>(GO1).</b></li> <li>• <b>Laboratory Experience:</b> The course aims to provide hands-on laboratory experiences where students can apply theoretical knowledge to practical scenarios. <b>(GO3).</b></li> <li>• <b>Preparation for Advanced Courses:</b> Prepare students for more advanced courses. A solid understanding of this course is essential in electronics, signal processing, control systems, and other specialized areas. <b>(GO1).</b></li> </ul>
9. Teaching and Learning Strategies	
<b>Strategy</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the discussion, while at the same time refining and expanding their critical thinking skills. This will be achieved through:

1. Active Learning: Encourages students to participate in the learning process through discussions, group projects, practical experiments, and problem-solving exercises.
2. Interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
3. Gamification: in order to increase motivation and engagement in the learning process, game elements will be incorporated, such as competition, rewards, and challenges.

### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week1	5 hrs	GO1 and GO3	Review the Course MTE 113, Discuss the Syllabus,	Class lecture + LABs	Class participation + Labs Task
Week2	5 hrs	GO1 and GO3	Capacitance and Inductance Revision: L & C in series and parallel.	Class lecture + LABs	Assignments 1 + Labs Task
Week3	5 hrs	GO1 and GO3	Introduction to Alternating Current (AC): Waveforms, peak, instantaneous value and A.C. Values	Class lecture + LABs	Quiz 1 + Labs Task
Week4	5 hrs	GO1 and GO3	Phasors, Phasor Diagrams, leads, lags.	Class lecture + LABs	Class work + Labs Task
Week5	5 hrs	GO1 and GO3	Impedance and Admittance, Series and parallel combinations of impedances and admittance	Class lecture + LABs	Class work + Labs Task
Week6	5 hrs	GO1 and GO3	Introduction to Sinusoidal Steady-State Analysis	Class lecture + LABs	Quiz 2 + Labs Task
Week7	5 hrs	GO1 and GO3	Nodal and Mesh Analysis Techniques in AC Circuits	Class lecture + LABs	Class work + Labs Task
Week8	5 hrs	GO1 and GO3	Mid-term Exam	Midterm exam	Midterm exam
Week9	5 hrs	GO1 and GO3	Superposition Theorem, Source Transformation	Class lecture + LABs	Class work + Labs Task

<b>Week10</b>	5 hrs	GO1 and GO3	Thevenin and Norton Equivalent Circuits, Maximum power transformation in AC circuit	Class lecture + LABs	Assignments 2 + Labs Task
<b>Week11</b>	5 hrs	GO1 and GO3	AC Power Analysis: Instantaneous, Average, RMS, Apparent Power and Power Factor	Class lecture + LABs	Class work + Labs Task
<b>Week12</b>	5 hrs	GO1 and GO3	AC Power Analysis: Complex Power and the Power Triangle	Class lecture + LABs	Class work + Labs Task
<b>Week13</b>	5 hrs	GO1 and GO3	Resonance and Quality Factor	Class lecture + LABs	Quiz 3 + Labs Task
<b>Week14</b>	5 hrs	GO1 and GO3	Resonance in series-parallel circuits	Class lecture + LABs	Report + Labs Task
<b>Week15</b>	5 hrs	GO1 and GO3	Review, Practice before the final Exam	Revision lecture + discussion	Class participation + Labs Task
<b>Week 16</b>	3 hrs	GO1 and GO3	The final Exam	The final Exam	Final 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

Assessment Type	Number / Duration	Marks
Quizzes	5	5% (5 Marks)
Assignments	10	10% (10 Marks)
Project / Lab	10	10% (10 Marks)
Report	15	15% (15 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education
Main references (sources)	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education
Recommended books and references (scientific journals, reports...)	Introductory circuit analysis / Robert L. Boylestad, 11 <sup>th</sup> ed.
Electronic References, Websites	<a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a>

1. Course Name:	
<b>Physics II</b>	
2. Course Code:	
<b>MTE114</b>	
3. Semester / Year:	
Second semester 2025-2026	
4. Description Preparation Date:	
1-9-2025	
5. Available Attendance Forms:	
CL Class (Lecture), Tut (Tutorial)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
<b>48 hr/sem (SSWL: Structured Student Workload) / 4 ECTS (European Credit Transfer and Accumulation System).</b>	
7. Course administrator's name	
Name: Dr.marwaa ezaldeen Email: <a href="mailto:mialabasy@uomosul.edu.iq">mialabasy@uomosul.edu.iq</a>	
8. Course Objectives	
<b>Course Objectives</b>	<p>GO (I)</p> <ul style="list-style-type: none"> <li>Throughout the course, problem-solving will be a key focus. For example, in (Electrical Conduction in Metals), students will identify and solve problems related to electrical conductivity using their understanding of electron distribution and Fermi levels. Similarly, in (Diode Circuit Applications), they will evaluate and solve circuits, applying their knowledge of diodes. Assignments and lab work can be structured to require students to apply their knowledge of physics and mathematics to identify and solve real-world engineering problems, thus directly linking to this outcome.</li> </ul> <p>GO (V)</p> <ul style="list-style-type: none"> <li>Integrate discussions on the ethical implications of electronics and its applications. For instance, while studying semiconductor materials, and photovoltaic cells, discuss the environmental impacts and ethical considerations of material sourcing and waste. Assign case studies or discussion topics that require students to consider the ethical dimensions of their work, emphasizing the responsibility of engineers to make decisions that are not only technically sound but also ethically responsible</li> </ul> <p>GO (VI)</p> <ul style="list-style-type: none"> <li>As the course progresses into more advanced topics like Advanced Semiconductor Concepts and Transistor Principles, students will be introduced to complex concepts that require them to integrate and extend their knowledge. Encourage self-directed learning, perhaps through a project or research assignment, where students delve into a topic not fully covered in class, demonstrating their ability to independently acquire new knowledge in the field</li> </ul> <p>GO (VII)</p> <ul style="list-style-type: none"> <li>Tutorials and group discussions: Implement team-based projects and labs throughout the course, such as in (Advanced p-n Junction Concepts) and (Application Circuits using Transistors), where students must work together to design, analyze, and troubleshoot circuits. These activities should require them to collaborate across different facets of the topic,</li> </ul>

analyze data, propose solutions, and meet project deadlines, mirroring the multi-disciplinary team dynamics found in professional environments.

### 9. Teaching and Learning Strategies

**Strategy**

1. Theoretical lectures
2. Tutorial sessions
3. Assignments
4. Quizzes

### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	V / VI / VII	Introduction to Atomic Structure and Energy Levels Overview of the atom and its models Wave nature of light Dual nature of matter	Theoretical lectures Tutorial sessions	
2	3	V / VI / VII	Energy Band Theory and Crystal Structure Energy-band theory of metals, insulators, and semiconductors Crystal structure and bonding (ionic, covalent, and metallic)	Theoretical lectures Tutorial sessions	
3	3	V / VI / VII	Detailed Look at Crystal Structures Internal structure of material cells Packing, Miller indices Crystal planes and directions	Theoretical lectures Tutorial sessions	
4	3	V / VI / VII	Electrical Conduction in Metals Mobility and conductivity Energy distribution of electrons Fermi levels and work function	Theoretical lectures Tutorial sessions	Activity

5	3	I / V / VI / VII	Electronic Emission in Metals Electronic emission theories Factors affecting electronic emission	Theoretical lectures Tutorial sessions	Quiz
6	3	I / V / VI / VII	Introduction to Semiconductors Semiconductor materials (Si, Ge, and compound semiconductors) Intrinsic and extrinsic semiconductors	Theoretical lectures Tutorial sessions	Assignment
7		I	Mid-term exam		Midterm Exam
8	3	V / VI / VII	Advanced Semiconductor Concepts Fermi-level in semiconductors Diffusion and carrier lifetime Hall effect	Theoretical lectures Tutorial sessions	
9	3	I / V / VI / VII	p-n Junction Theory p-n junction in equilibrium Current-voltage characteristics Charge-control description of a diode	Theoretical lectures Tutorial sessions	Assignment
10	3	V / VI / VII	Advanced p-n Junction Concepts Transition and diffusion capacitances Diode switching times Diode models and small-signal model	Theoretical lectures Tutorial sessions	Activity
11	3	V / VI / VII	Diode Circuit Applications - Rectifiers - Zener diodes voltage regulators - Clipping and clamping circuits	Theoretical lectures Tutorial sessions	Activity
12	3	I / V / VI / VII	Waveform Generation and	Theoretical lectures Tutorial sessions	Quiz

			Load Line Concept Waveform generation using diodes Load line concept Introduction to Hetero-junctions and double Hetero-junctions		
13	3	V / VI / VII	Transistors - Principles and Operations Principle of operation and types of transistors Transistor biasing circuits	Theoretical lectures Tutorial sessions	
14	3		Review of the course material		
15		I	Final 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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Dr. Mudafar A. Alnimahl. (2001) "ELECTRONIC PHYSIC ", 1st Edition, ISBN: 978-1-118-12984-5, USA.
Main references (sources)	Donald A. Neamen. (2003). "SEMICONDUCTOR PHYSICS AND DEVICES". 3rd Edition, ISBN 0-07-232107-05, USA.  Semiconductor Devices Physics and Technology. S. M. SZE; M. K. LEE by John Wiley & Sons, Inc Third Edition 2012
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

**Study Courses of the Department of Mechatronics Engineering /  
College of Engineering / University of Mosul  
Second Level / Bologna Process Track**

Level	Semester	No.	Module Code	Module Name In English	اسم المادة الدراسية	Language	CL (hr/w)	SSWL (hr/w)	Pr (hr/w)	Tut (hr/w)	Sem (hr/w)	Exam hr/sem	SSWL n/se m	Ussiv n/se m	SWL n/se m	ECTS	Module Type	Prerequisite Module(s)	
UGII	Three	1	UOM 2050	Crimes of the Bath regime in I	جرائم نظام البعث في العراق	Arabic	2					3	33	17	50	2.00	S		
		2	MTE 202	Engineering Mechanics-Dynam	الميكانيكا الهندسية - الحركي	English	4			1		3	78	47	125	5.00	C		
		3	MTE 203	Applied Mathematics I	الرياضيات التطبيقية I	English	4			1		3	78	72	150	6.00	B	MTE 109	
		4	MTE 204	Electronic Principles and Device	مبادئ الاكترونك والبيانات	English	4	2				3	93	57	150	6.00	C	MTE 113	
		5	MTE 205	Electrical Machines	المكين الكهربائي	English	2	1			1		3	63	37	100	4.00	C	MTE 113
		6	MTE 206	Thermodynamics	الديناميكا الحرارية	English	3						3	48	27	75	3.00	C	
		7	UOM 2022	English Language 2	اللغة الانكليزية 2	English	2						3	33	17	50	2.00	C	
		8	MTE 207	Experimntal Methods for Engine	الطرق المختبرية للمهندسين	English	2						3	33	17	50	2.00	C	
							Total	23	0	3	0	3	24	459	291	750	30.00		
UGII	Four	1	MTE 208	Applied Mathematics II	الرياضيات التطبيقية II	English	4	1				3	93	57	150	6.00	B	MTE 109	
		2	MTE 209	Fluid Mechanics	ميكانيكا الموائع	English	4			1		3	63	37	100	4.00	C		
		3	MTE 210	Mechanics of Materials	ميكانيكا المواد	English	2			2		3	63	37	100	4.00	B		
		4	MTE 211	Digital Logic Design	تصميم الدوائر المنطقية	English	2	2				3	63	37	100	4.00	C		
		5	MTE 212	Statistics	احصاء	English	3				1		3	63	62	125	5.00	B	
		6	MTE 213	Signals and Systems	الانترتات و النظم	English	2						3	33	17	50	2.00	C	MTE 203
		7	UOM 2032	Computer2	الحاسوب 2	English	1	2					3	48	27	75	3.00	B	
		8	UOM 2012	Arabic language2	اللغة العربية 2	Arabic	2						3	33	17	50	2.00	S	
							Total	20	1	4	0	4	24	459	291	750	30.00		

1. Course Name:	
Crimes of the Ba'ath Regime in Iraq	
2. Course Code:	
UOM 2050	
3. Semester / Year:	
First Semester / Academic Year 2025–2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
33hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Lecturer Ahmed Khaled Ahmed Email: ahmed.khalied@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> <li>• Introducing students to the nature of the Ba'ath regime in Iraq and its historical context during the period (1968–2003).</li> <li>• Clarifying the most prominent crimes and violations committed by the regime against various segments of Iraqi society.</li> <li>• Studying pivotal events such as the Anfal campaigns, forced displacement, mass graves, suppression of uprisings, and policies of arrest and torture.</li> <li>• Analyzing these crimes in light of historical and legal concepts of human rights and crimes against humanity.</li> <li>• Explaining the political, social, and economic impacts of those crimes on Iraqi society.</li> <li>• Developing students' ability to engage with historical sources (documents, testimonies, memoirs, and international reports).</li> <li>• Training students in critical thinking and the scientific analysis of contemporary historical events.</li> <li>• Consolidating awareness of the importance of respecting human rights and rejecting tyranny and political violence.</li> <li>• Linking the study of the past to the requirements of state-building and the promotion of social peace in Iraq.</li> </ul>
9. Teaching and Learning Strategies	
Strategy	<p>Interactive lecture Classroom discussion Cooperative learning Analysis of some historical documents Presentations Individual or group research Use of audio-visual aids</p>
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Students will be able to <b>outline</b> the political circumstances and the specific events of the 1968 coup that brought the Baath party to power.	<ul style="list-style-type: none"> <li>- Historical context: The July 17–30, 1968, coup.</li> <li>- The structure of the regime and the consolidation of power.</li> <li>- Defining the political ideology vs. historical practice.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
2	2	Students will be able to <b>classify</b> different types of state-sponsored violence into legal categories such as war crimes and crimes against humanity.	<ul style="list-style-type: none"> <li>- Defining "Crime" in legal and historical contexts.</li> <li>- Classification: Political crimes, war crimes, and crimes against humanity.</li> <li>- Introduction to international human rights standards.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
3	2	Students will be able to <b>describe</b> the internal security mechanisms and intelligence apparatus used to consolidate authoritarian control during the 1970s.	<ul style="list-style-type: none"> <li>- The role of the intelligence services (Mukhabarat).</li> <li>- The liquidation of political opponents and the 1979 "Comrades' Massacre."</li> <li>- Legal frameworks used to justify authoritarianism.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
4	2	Students will be able to <b>analyze</b> how the Iran-Iraq War served as a catalyst for increased domestic violations and the militarization of civil society.	<ul style="list-style-type: none"> <li>- The Iran-Iraq War era (1980–1988).</li> <li>- Internal purges and the militarization of Iraqi society.</li> <li>- Socio-economic impacts of prolonged conflict.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
5	2	Students will be able to <b>identify</b> the systematic phases of the Anfal campaigns and the specific geographic regions targeted by the regime.	<ul style="list-style-type: none"> <li>- Planning and chronological sequence of the campaigns (1986–1989).</li> <li>- The geographic scope and the systematic destruction of rural life.</li> <li>- Document analysis: Administrative orders of the Anfal.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation

6	2	Students will be able to <b>explain</b> the technical and humanitarian impact of the chemical attack on Halabja within the framework of international law.	<ul style="list-style-type: none"> <li>- The chemical attack on Halabja (March 1988).</li> <li>- Global reactions and the legal definition of Genocide.</li> <li>- Case study: Survivors' testimonies.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
7	2	Students will be able to <b>evaluate</b> the regime's response to the 1991 uprisings and the resulting humanitarian crisis in the southern and northern provinces.	<ul style="list-style-type: none"> <li>- Context: Post-Gulf War environment.</li> <li>- The brutal suppression of the uprising in Southern and Northern Iraq.</li> <li>- Violations in holy cities and the targeting of civilians.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
8	2		Midterm Exam		quizzes, reports, participation
9	2	Students will be able to <b>summarize</b> the environmental and cultural consequences of the deliberate draining of the Iraqi Marshes (Al-Ahwar).	<ul style="list-style-type: none"> <li>- The historical and cultural significance of the Marshes.</li> <li>- The deliberate draining of the Marshes as a weapon of war and displacement.</li> <li>- Impact on the Marsh Arabs (Ma'dan) and ecological catastrophe.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
10	2	Students will be able to <b>critique</b> the "Arabization" policies and the methods used for the forced displacement of ethnic and religious minorities.	<ul style="list-style-type: none"> <li>- The "Arabization" policies (Ta'rib) in Kirkuk and other regions.</li> <li>- Systematic expulsion of Faili Kurds and other minority groups.</li> <li>- Deprivation of citizenship and property seizure.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
11	2	Students will be able to <b>discuss</b> the forensic and historical significance of mass graves as evidence for documenting human rights violations.	<ul style="list-style-type: none"> <li>- The phenomenon of mass graves discovered post-2003.</li> <li>- Mapping the sites of violations.</li> <li>- Forensic evidence and its role in historical documentation.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> <li>-Classroom discussion</li> <li>-Cooperative learning</li> <li>-Analysis of some historical documents</li> </ul>	quizzes, reports, participation
12	2	Students will be able to <b>correlate</b> the regime's economic policies	<ul style="list-style-type: none"> <li>- The regime's handling of the 1990s sanctions.</li> </ul>	<ul style="list-style-type: none"> <li>-interactive lecture</li> </ul>	quizzes, reports, participation

		during the sanctions era with the deterioration of the Iraqi middle class and public health.	- The "Oil-for-Food" corruption and the decline of the middle class. - Education and health sectors under the regime.	-Classroom discussion -Cooperative learning -Analysis of some historical documents	
13	2	Students will be able to <b>articulate</b> the importance of historical memory in preventing the recurrence of political authoritarianism and violence.	- Value-based outcomes: Reinforcing the rejection of authoritarianism. - The importance of preserving historical memory for future generations. - The role of documentation in achieving social peace.	-interactive lecture -Classroom discussion -Cooperative learning -Analysis of some historical documents	quizzes, reports, participation
14	2	- Students will be able to <b>construct</b> a well-researched academic argument or report utilizing primary and secondary historical sources. -	- Student presentations: Short reports on specific case studies or documents. - Cooperative learning: Group discussion on the culture of coexistence.	-interactive lecture -Classroom discussion -Cooperative learning -Analysis of some historical documents	quizzes, reports, participation
15	3	Final Exam	Final Exam		quizzes, reports, participation

#### 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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

#### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Prescribed textbook
Main references (sources)	Contemporary history books of Iraq
Recommended books and references (scientific journals, reports...)	Human rights organizations' reports Documents of the Martyrs Foundation and mass graves Peer-reviewed academic studies on contemporary Iraqi history
Electronic References, Websites	

1. Course Name:	
Engineering Mechanics-Dynamic	
2. Course Code:	
MTE 202	
3. Semester / Year:	
First Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Tut (Tutorial)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
78 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System)	
7. Course administrator's name	
Name: Asst. Lecturer Bakr Noori Alhasan	
E-mail: bakralhasan@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectiv</b>	<ul style="list-style-type: none"> <li>• Describe the linear and curved motion of a single particle using the fundamental concepts of displacement, velocity, and acceleration, and distinguish between different coordinate systems used in kinematic analysis (such as Cartesian, polar, and arc length coordinates).</li> <li>• Apply mathematical relationships that connect motion variables to solve problems related to particle motion, and develop the ability to graphically represent motion and analyze the relationships between different quantities.</li> <li>• Apply Newton's second law directly to particles moving under the influence of external forces by constructing and analyzing free-body diagrams to accurately determine the acting forces, or indirectly by formulating equations involving the concepts of work, kinetic energy, potential energy, as well as linear and angular impulse and momentum.</li> <li>• Analyze the planar motion of rigid bodies by classifying it into translational, rotational, and general motion, and use geometric and physical relationships to determine the velocity and acceleration of different points on the body.</li> <li>• Understand the application of linear and angular velocity and acceleration in describing the motion of bodies through the concept of relative velocity or acceleration.</li> </ul>
9. Teaching and Learning Strategies	

<b>Strategy</b>	Lectures Tutorials Quizzes Class works Home works Reports
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### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	I, II, VI, VII	Ch.1 Introduction to Dynamics	Theoretical lectures Discussion sessions	Written test assignment
2	5	I, II, VI, VII	Ch.2 Kinematics of Particles, Rectilinear Motion	Theoretical lectures Discussion sessions	Written test assignment
3	5	I, II, VI, VII	Plane Curvilinear Motion, Rectangular Coordinates (x-y)	Theoretical lectures Discussion sessions	assignment
4	5	I, II, VI, VII	Normal and Tangential Coordinates (n-t)	Theoretical lectures Discussion sessions	Written test
5	5	I, II, VI, VII	Polar Coordinates (r-Theta)	Theoretical lectures Discussion sessions	assignment
6	5	I, II, VI, VII	Relative Motion (Translating axes)	Theoretical lectures Discussion sessions	Written test
7	5	I, II, VI, VII	Ch.3 Plane Kinetics of Particles	Theoretical lectures Discussion sessions	assignment
8	5	I, II, VI, VII	Direct Application of Newton's second Law (Force, Mass, and Acceleration): Rectilinear and Curvilinear Motion	Theoretical lectures Discussion sessions	Written test assignment

9	5	I, II, VI, VII	Work and Kinetic Energy	Theoretical lectures Discussion sessions	Written test assignment
10	5	I, II, VI, VII	Impulse and Momentum (Linear)	Theoretical lectures Discussion sessions	Written test assignment
11	5	I, II, VI, VII	Mid Term Examination		Written test
12	5	I, II, VI, VII	Ch.5 Plane Kinetics of Rigid Bodies: Rotation	Theoretical lectures Discussion sessions	assignment
13	5	I, II, VI, VII	Relative Velocity	Theoretical lectures Discussion sessions	Written test
14	5	I, II, VI, VII	Ch.6 Plane Kinetics of Rigid Bodies: direct application of Newton's second Law: Translation	Theoretical lectures Discussion sessions	assignment
15	5	I, II, VI, VII	Appendix B. Mass Moment of Inertia	Theoretical lectures Discussion sessions	Written test

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering Mechanics "Dynamics", J.L. Meriam and L.D. Kraige 5th ed
Main references (sources)	Engineering Mechanics 'Dynamics', R. C. Hibbeler

Recommended books and references (scientific journals, reports...)	
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Electronic References, Websites	
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1. Course Name:	
Applied Mathematics I	
2. Course Code:	
MTE 203	
3. Semester / Year:	
First Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Tut (Tutorial)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
78 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
Name: Asst. Lecturer Mamoon Ammar Alatrakchii E-mail: mamoonatrakchii@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<p>1) Student will be able to identify multivariable functions and find any partial derivative of such function with understanding of geometrical meaning of these derivatives. [ I ]</p> <p>2) Student can identify multivariable functions critical points (maxima, minima, and saddle points.) [ I ]</p> <p>3) Student can recognize complex number, variable, various functions, and also their representation on the complex plane. Student will have the ability to manipulate functions form to transform complex function representation from Cartesian form to polar or exponential form or vice versa. Also, he/she will be able to find complex roots, and any power of a complex variable. [ I, VI ]</p> <p>4) Student will be able to identify continuous and analytic functions, and test if they are harmonic or not by satisfying Laplace equation. [ I, VI ]</p> <p>5) Student will be able to identify even, odd, and periodic functions. [ I, III ]</p> <p>6) Student will be able to represent periodic functions using trigonometric and complex Fourier Series representation. Also, will be able to represent aperiodic functions using Half range Fourier Series representation. [ I ]</p> <p>7) Student will be able to use Fourier Transforms of various engineering functions. [ I, VI ]</p> <p>8) Student can recognize, understand, and implement vector quantities and algebraic operations. He/She should be able to understand and use parametric representation of line, plane and curve in space. [ I, III ]</p> <p>9) student will be able to implement vector quantity derivatives to find velocity and acceleration. Also, he/she will understand the meaning of gradient, Div, and Curl of vector quantities. [ I, VI ]</p>
9. Teaching and Learning Strategies	

<b>Strategy</b>	1-Theoretical lectures 2-Discussion sessions 3-Computer software
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### 10. Course Structure

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
1	5	I	Limits and continuity , Partial derivatives (definitions, functions of more than two variables), second and higher order partial derivatives.	1+2+3	HW
2	5	I	Chain rule for functions of two or three variables , Maxima and minima and saddle points.	1+2+3	HW + Quiz
3	5	I, VI	Complex analysis: Definitions and basic concepts, Cartesian form, polar form, exponential form, representations of a complex variable. Complex variables algebra, Roots of a complex number.	1+2+3	HW
4	5	I, VI	Complex analysis: complex functions, limits, derivatives and continuity of complex functions. Analytic functions, Cauchy-Riemann equations, derivatives of analytic functions. Laplace equation, Harmonic and conjugate harmonic functions.	1+2+3	HW
5	5	I, VI	Complex analysis: Rational functions, Logarithmic functions, Exponential functions.	1+2+3	HW
6	5	I, VI	Complex analysis: Trigonometric and hyperbolic functions, General power of complex variables.	1+2+3	HW
7	5	I, VI	Complex analysis: Integration along a line	1+2	HW + Quiz
8	5	I, III	Fourier Series: even and odd function , Half Wave Symmetry, periodic functions, definition of Fourier series, Trigonometric form	1+2+3	HW
9	5	I, III	Fourier Series: Line Spectrum (harmonic) the Fourier Series, Half wave symmetry, sum and shift of functions, Complex Exponential form of the Fourier Series	1+2+3	HW + Quiz
10	5	I, VI	Fourier Series: introduction to Fourier Transforms	1+2+3	HW
11	5	I, VI	Fourier Series: Fourier Transforms	1+2+3	HW + Quiz
12	5	I, III	Introduction to Vector Analysis: definition, notation, properties, Vector algebra: addition, subtraction, multiplications	1+2	HW

13	5	I, III	Introduction to Vector Analysis: vector algebra (continue) with applications	1+2	HW
14	5	I, III	Introduction to Vector Analysis: Vectors and Geometry, equation of line, plane, curve parameterization with geometric applications.	1+2	HW
15	5	I, VI	Introduction to Vector Analysis: vector function and field, derivative of vector functions, velocity, acceleration. introduction to gradient, Div, and Curl. Eigenvalues and Eigenvectors.	1+2	HW + Quiz

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ol style="list-style-type: none"> <li>1. E. Kreyszig, et al, "Advanced Engineering Mathematics," 10th ed., McGraw Hill, 2011.</li> <li>2. George B. Thomas, Jr., "Thomas' Calculus Early Transcendentals," 13th Ed, 2014.</li> </ol>
Main references (sources)	D.G. Zill, "Advanced Engineering Mathematics," 6th Ed, 2018
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
Electronic Principles and Devices	
2. Course Code:	
MTE 204	
3. Semester / Year:	
First Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Lab (Laboratory)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
93 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
Name: Dr. Omar S. Abdulwahid Email: omar.abdulwahid@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<p>The objectives of this course are:</p> <ol style="list-style-type: none"> <li><b>Linked to GO I:</b> Use of knowledge from different topics including construction and principle of operation of diode, and its applications including clamper circuit, clipper circuit, rectifiers. Also, BJT structure, BJT as amplifier to identify, formulate, and solve complex problems related to the DC and AC analysis of electronic devices. <u>This competency will be assessed through the Midterm Exam, Quizzes, HomeWorks, and Final Exam.</u></li> <li><b>Linked to GO II</b> Acquire the general considerations and steps required in designing electronic circuits for different application in the field of interest such as rectifiers using diodes and amplifier based BJT device, <u>this competency will be assessed through the Final Exam.</u></li> <li><b>Linked to GO III</b> Develop and apply experimental skills, conduct experiments, and analyses/interpret data related to DC&amp;AC electronic circuits-based diodes and BJT devices. <u>This competency will be assessed through the experimental work of lab, Mid-term and Final Exams.</u></li> <li><b>Linked to GO VII</b> Function effectively on multi-disciplinary teams to analyse problems, devise solutions, and meet deadlines within the context of electronic circuits. Apply collaborative problem-solving skills to topics related to the experimental work of electronics. <u>This competency will be assessed through lab work</u></li> </ol>

## 9. Teaching and Learning Strategies

<b>Strategy</b>	1-Theoretical lectures 2-Laboratory experiments 3- HomeWorks 4-Exams 5-Reports
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## 10. Course Structure (Theoretical Part)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I	Introduction (Semiconductor Diodes, pn junction diode, Diode Applications, Rectifier circuits, clipper, clamper)	Theoretical Lectures	Quiz
2	4	I	Zener diode and its application (voltage regulator)	Theoretical Lectures	H.W and Quiz
3	4	I, II	Introduction to Bipolar junction transistors (BJT) and its configurations	Theoretical Lectures	
4	4	I, II	DC analysis of BJT equivalent circuits (Introduction, operating point, Fixed-bias Configuration, Emitter-bias Configuration, Voltage-divider Bias Configuration, Collector Feedback Configuration, Emitter-follower Configuration (common collector).	Theoretical Lectures	H.W
5	4	I, II	AC analysis of BJT equivalent circuits part 1, introduction, equivalent model, re-model Fixed bias configuration, re-model Voltage-divider bias configuration	Theoretical Lectures	H.W
6	4	I	AC analysis of BJT equivalent circuits part 2 (re-model CE Emitter-Bias configuration,	Theoretical Lectures	H.W

			1) Un-bypassed situation. 2) bypassed configuration		
7	4	I	re-model of Emitter-Follower Configuration, re model of common Base configuration , Re-model Collector Feedback C	Theoretical Lectures	H.W
8	4	I	Effect of RL And RS, Design example of the C.E amplifier circuit Multi stages transistor , Cascaded Systems Transistor as switch	Theoretical Lectures	
9	4	II	Field-Effect Transistor FET (Introduction and types) ,	Theoretical Lectures	H.W
10	4	I, II	Metal–Oxide–Semiconductor Field-Effect Transistor types of MOSFETs and Basic Construction and Basic Operation and	Theoretical Lectures	H.W
11	4	I, II	Characteristics of:- 1. Depletion-type MOSFET (DMOSFET). Enhancement-type MOSFET (EMOSFET). Field-Effect Transistor Biasing part 1 Introduction. Fixed-Bias Configuration. Self-Bias Configuration. Voltage-Divider Biasing. Common-Gate Configuration.	Theoretical Lectures	H.W and Quiz
12	4	I		Theoretical Lectures	Exam
13	4	I, II	Field-Effect Transistor Biasing part 2 Depletion-Type MOSFETs. Enhancement-Type MOSFETs. Combination Networks. Design.	Theoretical Lectures	
14	4	I, II	Introduction to the operational amplifier,	Theoretical Lectures	

			Practical OP-AMP Circuits, Applications of operational amplifier part1 (Inverting Amplifier, Non-inverting Amplifier, Unity Follower, Integrator, Differentiator		
15	4	I	Applications of operational amplifier part2 (Comparator, Voltage Subtraction, Voltage Summing, Multiple-Stage Gains, Constant-gain Multiplier...)	Theoretical Lectures	

### Course Structure (Lab Work Part)

Week	Hours	Required Learning Outcomes	Introduction to lab experiments and devices, Diode Test and Characteristics	Learning method	Evaluation method
1	2	III, VII	Diode Application (Clipper circuits)	Experiment	
2	2	III, VII	Diode Application (Clamper circuits)	Experiment	Report 1 H.W
3	2	III, VII	Half and full wave rectifiers, Bridge Rectifiers	Experiment	
4	2	III, VII	BJT types and test, DC characteristics of BJT	Experiment	Report 2 H.W
5	2	III, VII	Common Emitter amplifier circuits (Fixed bias and Emitter self-bias configuration),	Experiment	H.W
6	2	III, VII	Common Emitter amplifier circuits (Voltage Divider, Multistage transistors, Transistor as a switch	Experiment	Report 3
7	2	III, VII	JFET – Characteristics (1), JFET – Characteristics (2).	Experiment	H.W
8	2	III, VII	Mid-Term Exam	Exam	
9	2	III	MOSFET – Characteristics (1) MOSFET – Characteristics (2)	Experiment	Report 4

10	2	III, VII	JFET – Amplifier	Experiment	Report 4
11	2	III, VII	MOSFET – Amplifier	Experiment	
12	2	III, VII	Basic Chara. Of Operational Amplifier	Experiment	Report 5
13	2	III, VII	Applications of Op-AMP	Experiment	
14	2	III, VII	Applications of Op-AMP -2	Experiment	
15	1	III, VII		Experiment	

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>R. L. Boylestad, Electronic Devices and Circuit Theory, 11th Edition, Prentice Hall, 2009.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>Thomas L. Floyd, Electronic Devices, 9th Addition, Pearson Prentice Hall, 2005</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
Electrical machines					
2. Course Code:					
MTE 205					
3. Semester / Year:					
First Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial), Lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 4 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
1- Name: Dr. Myasar salim alattar E-mail: myasalarattar@uomosul.edu.iq					
8. Course Objectives					
Course Objectives		The objective of this course is to:			
		<ol style="list-style-type: none"> <li>1. Ability to solve engineering problems.</li> <li>2. Ability to produce engineering designs.</li> <li>3. Ability to create and carry out measurements and tests.</li> <li>4. Ability to work on teams and manage projects</li> </ol>			
9. Teaching and Learning Strategies					
Strategy		<ol style="list-style-type: none"> <li>1- Theoretical lectures</li> <li>2- home work</li> <li>3- Assignments</li> <li>4- lab</li> </ol>			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I	types of electric dc machine (shunt, series, compound)	Theoretical lectures	
2	4	I,II	construction of dc machine	Theoretical lectures	

3	4	I,II	principle operation of dc motor torque and voltage equation of dc motor	Theoretical lectures	
4	4	I,II	dc shunt motor equivalent circuit , analysis	Theoretical lectures	
5	4	I, II, III	dc series motor equivalent circuit , analysis	Theoretical lectures	quiz
6	4	I,II	dc compound motor equivalent circuit , analysis	Theoretical lectures	
7	4	I, II, ,III,VII	losses in dc motor and efficiency	Theoretical lectures	
8	4	I,II,III	Mid-Term Exam	Theoretical lectures	midterm exam
9	4	I,II	speed control method of dc shunt motor (flux control	Theoretical lectures	
10	4	I, II, ,III,VII	speed control method of dc shunt motor (armature control, voltage control)	Theoretical lectures	
11	4	I, II, III	speed control method of dc series motor ( flux control	Theoretical lectures	quiz
12	4	I,II	speed control method of dc series motor voltage control	Theoretical lectures	
13	4	I,II	characteristics of dc shunt motor	Theoretical lectures	
14	4	I,II	characteristics of dc compound motor	Theoretical lectures	
15	4	I, II, III			<b>Final Exam</b>

#### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)

<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>
<b>12.Learning and Teaching Resources</b>		
Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>• Electrical Machines by S. K. Sahdev 2018</li> <li>• PRINCIPLES OF ELECTRIC MACHINES AND POWER ELECTRONICS , THIRD EDITION .by P. C. SEN 2013</li> </ul>	
Main references (sources)	<ul style="list-style-type: none"> <li>• ELECTRICAL MACHINES with MATLAB® ,Second Edition by TURAN GÖNEN ,2012</li> </ul>	
Recommended books and references (scientific journals, reports...)		
Electronic References, Websites		

1. Course Name:					
<b>Thermodynamic</b>					
2. Course Code:					
MTE 206					
3. Semester / Year:					
First Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
48 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Dr. Loay Bashir E-mail: loayaldabbagh@uomosul.edu.iq					
8. Course Objectives					
Course Objectives		1) Understand properties of real substances, such as steam and ideal gases [I, II] 2) Learn how to use tabular data and equations of state [I, II] 3) Understand and use the process diagrams. [I, II] 4) Understand closed systems and control volumes. [I, II, VI] 5) Understand the first law and its basic applications. [I, II] 6) Understand the second law and its basic applications. [I, II, VI ]			
9. Teaching and Learning Strategies					
Strategy		1-Theoretical lectures 2-Projects			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	I, II	Introduction to Thermodynamics	Lecture	quizzes
2	3	I, II	Properties of Pure Substances	Lecture	quizzes

3	3	I, II	The First Law of Thermodynamics for Closed Systems	Lecture	quizzes
4	3		The First Law of Thermodynamics for Closed Systems	Lecture	quizzes
5	3		The First Law of Thermodynamics for Closed Systems	Lecture	quizzes
6	3	I, II	The First Law of Thermodynamics for Open Systems	Lecture	quizzes
7	3	I, II, VI	The First Law of Thermodynamics for Open Systems	Lecture	quizzes
8	3		Mid-Term Examination		Exam
9	3		The Second Law of Thermodynamics	Lecture	quizzes
10	3	I, II	The Second Law of Thermodynamics	Lecture	quizzes
11	3	I, II	Introduction to heat transfer	Lecture	quizzes
12	3	I, II	Introduction to heat transfer	Lecture	quizzes
13	3	I, II	One-dimensional conduction	Lecture	quizzes
14	3	I, II	One-dimensional conduction	Lecture	quizzes
15	3	I, II, VI	Final Examination		Final 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)

<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>
<b>12.Learning and Teaching Resources</b>		
Required textbooks (curricular books, if any)	Çengel, Y. A. and Boles, M. A., Thermodynamics: an Engineering Approach, 6th ed., The McGraw-Hill Companies, New York, © 2008.	
Main references (sources)	Bergman, lavine, Incropera and dewitt - Fundamentals of Heat and Mass Transfer, John Wiley & Sons, Inc., 7th Edition 2011.	
Recommended books and references (scientific journals, reports...)		
Electronic References, Websites		

1. Course Name:	
English Language 2	
2. Course Code:	
UOM 2022	
3. Semester / Year:	
First Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
33 hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Trans and Accumulation System).	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Rahma Ethar Abdulkareem E-mail: Rahma.aithar@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<p>The course aims to</p> <ol style="list-style-type: none"> <li>1. Develop students' English language skills in reading, writing, listening, and speaking.</li> <li>2. Enhance effective communication skills using English in academic and professional contexts.</li> <li>3. Equip students with basic engineering vocabulary and terminology to prepare them for the job market.</li> <li>4. Develop students' ability to understand, analyze, and translate specialized engineering texts.</li> <li>5. Enable students to express ideas and concepts clearly and systematically in English.</li> </ol>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<ol style="list-style-type: none"> <li>1. <b>Interactive Learning:</b> This is implemented through classroom dialogues and discussions to develop students' speaking skills.</li> <li>2. <b>Cooperative Learning:</b> Students work in groups to accomplish shared language tasks such as writing reports.</li> <li>3. <b>Self-Learning:</b> Students rely on external resources such as applications and dictionaries to independently develop their language skills.</li> <li>4. <b>E-Learning:</b> Digital tools and educational platforms are used to support interactive language learning.</li> </ol>
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The student identifies the course basics, objectives, and semester content.	Introductory lecture	Interactive explanation + examples + exercises	Attendance, participation, homework
2	2	The student distinguishes auxiliary verbs and uses them correctly.	Auxiliary verbs (have, be, do)	Interactive explanation + examples + exercises	Attendance, participation, homework
3	2	The student uses basic tenses accurately in sentences	Tenses (past, present, future)	Interactive explanation + examples + exercises	Attendance, participation, homework
4	2	The student forms grammatically correct questions with proper word order.	Question formation	Interactive explanation + examples + exercises	Attendance, participation, homework
5	2	The student applies prepositions of place correctly.	Prepositions (place)	Interactive explanation + examples + exercises	Attendance, participation, homework
6	2	The student applies prepositions of time correctly in context.	Prepositions (time)	Interactive explanation + examples + exercises	Attendance, participation, homework
7	2	The student uses articles correctly in sentences.	Articles (definite & indefinite)	Interactive explanation + examples + exercises	Attendance, participation, homework
8	2	The student identifies parts of speech and their functions.	Parts of speech	Interactive explanation + examples + exercises	Attendance, participation, homework
9	2	The student differentiates and uses sentence types correctly.	Sentence types (affirmative, interrogative, exclamatory, imperative)	Interactive explanation + examples + exercises	Attendance, participation, homework
10	2	The student reads and translates specialized texts accurately.	Reading and translation of specialized texts (Mechatronics)	Interactive explanation + examples + exercises	Attendance, participation, homework
11	2	The student uses pronouns correctly in sentences.	Pronouns (subject, object, possessive)	Interactive explanation + examples + exercises	Attendance, participation, homework

12	2	The student uses social expressions appropriately in communication.	Social expressions	Interactive explanation + examples + exercises	Attendance, participation, homework
13	2	The student applies “s” forms correctly in different contexts.	Forms of “S” (possession, third person singular, plural)	Interactive explanation + examples + exercises	Attendance, participation, homework
14	2	The student uses comparative and superlative forms correctly	Degrees of comparison	Interactive explanation + examples + exercises	Attendance, participation, homework
15	2	The student links words and sentences coherently.	Final Exam	Interactive explanation + examples + exercises	Attendance, participation, homework

### 11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, HomeWorks and Classwork’s, daily oral, monthly, or written exams, reports.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soars, J., & Soars, L. (2011). <i>New Headway: Beginner student’s book</i> (4th ed.). Oxford University Press.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
Expermental Methods for Engineers	
2. Course Code:	
MTE 207	
3. Semester / Year:	
First Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
33 hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Trans and Accumulation System).	
7. Course administrator's name	
Name: Dr. Marwah Ezzulddin Merza Email: <a href="mailto:mialabasy@uomosul.edu.iq">mialabasy@uomosul.edu.iq</a>	
8. Course Objectives	
Course Objectives	To introduce the students to basic concepts (calibration standards, dimensions and units, the generalized measurement .....), Analysis of experimental data, Basic electrical measurements and sensing devices, Displacement and area measurements, Pressure measurement, Flow measurement, the measurement of temperature, Force, torque and strain measurements, Motion and vibration measurement, Report writing and presentations and Design of experiments.
1. Teaching and Learning Strategies	
Strategy	<p><b>On completion of the course, students should be able to:</b></p> <ul style="list-style-type: none"> <li>• To improved their ability to use all type of Flow measurement, Pressure measurement, Temperature measurement, Force, Torque and strain measurement;</li> <li>• To improved their ability in writing reports and presented;</li> <li>• Understand the main formulation methods and the limitations of the equations derived from them;</li> <li>• Improved their ability to analysis the experimental data;</li> <li>• Design and conduct an experiment and present their results;</li> <li>• Improved their ability in dealing with equipment;</li> <li>• Demonstrate ability to function in design teams;</li> </ul>
9. Course Structure	

<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
<b>Week 1</b>	2	I	Introduction	Theoretical Lectures	Assignment Activity
<b>Week 2</b>	2	I	Chapter 2 Introduction and basic concepts: definition of terms (sensitivity, Accuracy....), calibration standards, dimensions and units, the generalized measurement system, Basic concepts in dynamic measurements, Experiment planning (the role of uncertainty analysis in experiment planning)	Theoretical Lectures Assignment	Quizzes
<b>Week 3</b>	2	I	Chapter 2 Introduction and basic concepts: definition of terms (sensitivity, Accuracy....), calibration standards, dimensions and units, the generalized measurement system, Basic concepts in dynamic measurements, Experiment planning (the role of uncertainty analysis in experiment planning)	Theoretical Lectures Discussion sessions	Assignment
<b>Week 4</b>	2	I	Chapter 15 Report writing and presentations: Some general comments, Types of reports, Contents of a report, Graphical Presentations	Theoretical Lectures Assignment	Activity Quizzes
<b>Week 5</b>	2	I	Chapter 3 Analysis of experimental data: Causes and types of Experimental Errors,	Theoretical Lectures Discussion sessions	Assignment

			Error Analysis on a Commonsense Basis, Uncertainty Analysis (Uncertainties for Product Functions, Uncertainties for Additive Functions, Evaluation of Uncertainties for Complicated Data Reduction, Statistical Analysis of Experimental Data,		
<b>Week 6</b>	2	I	Chapter 3 Analysis of experimental data: Causes and types of Experimental Errors, Error Analysis on a Commonsense Basis, Uncertainty Analysis (Uncertainties for Product Functions, Uncertainties for Additive Functions, Evaluation of Uncertainties for Complicated Data Reduction, Statistical Analysis of Experimental Data	Theoretical Lectures Discussion sessions	Assignment
<b>Week 7</b>	2	I	The Gaussian or Normal Error Distribution (Chauvenet s Criterion), Comparison of Data with Normal Distribution, Method of Least Squares, The correlation coefficient, Multivariable Regression, Standard Deviation of the Mean, Graphical analysis and Curve Fitting, Choice of Graph Formats	Theoretical Lectures Discussion sessions	Activity Quizzes
<b>Week 8</b>	2	I	Mid-Term Examination		Mid-Term Examination
<b>Week 9</b>	2	I	The Gaussian or Normal Error Distribution (Chauvenet s	Theoretical Lectures Assignment	Assignment Activity

			Criterion), Comparison of Data with Normal Distribution, Method of Least Squares, The correlation coefficient, Multivariable Regression, Standard Deviation of the Mean, Graphical analysis and Curve Fitting, Choice of Graph Formats		
<b>Week 10</b>	2	I	Chapter 6 Pressure measurement: Dynamic Response Considerations, mechanical Pressure-measurement Devices, Dead-Weigh Tester, Diaphragm and Bellows Gages, Low-Pressure Measurement, McLeod Gage, Flow measurement: Positive-Displacement Methods, Flow-Obstruction methods, Practical Considerations for Obstruction Meters, the Sonic Nozzle, Flow Measurement by Drang Effects (Rotameter)	Theoretical Lectures Assignment	Assignment
<b>Week 11</b>	2	I	The measurement of temperature: Temperature Scales, The Ideal-Gas Thermometer, Temperature Measurement by Mechanical Effects Temperature Measurement by Electrical Effects, Thermocouple Compensation	Theoretical Lectures Assignment	Assignment

<b>Week 12</b>	2	I	Force, torque and strain measurements: Mass Balance Measurements, Elastic Elements for Force Measurements	Theoretical Lectures	Assignment
<b>Week 13</b>	2	I	Torque Measurements, stress and Strain, Strain Measurements, Electrical Resistance Strain Gages,	Theoretical Lectures Assignment	Assignment
<b>Week 14</b>	2	I	Measurement of Resistance Strain-gage outputs, Temperature effect	Theoretical Lectures	Assignment Activity
<b>Week 15</b>	2	I	Final Exam		Final Exam

### 10. 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.

Assessment Type	Number / Duration	Marks
<b>Quizzes</b>	2	10% (10 Marks)
<b>Assignments</b>	5	10% (10 Marks)
<b>Project / Lab</b>	1	10% (10 Marks)
<b>Report</b>	1	10% (10 Marks)
<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 2. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Holman J. P., Experimental methods for engineering, 7th ed., The McGraw-Hill Companies, New York, © 2007. Reference book:
Main references (sources)	Holman J. P., Experimental methods for engineering, 7th ed., The McGraw-Hill Companies, New York, © 2007. Reference book:
Recommended books and references (scientific journals, reports...)	R. fox and A Mc Donald, Introduction to Fluid Mechanic, 4th ed Mc Graw Hill 1994
Electronic References, Websites	<a href="https://www.coursera.org/learn/">https://www.coursera.org/learn/</a>

1. Course Name:

Applied Mathematics II

2. Course Code:

MTE208

3. Semester / Year:					
Second Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial), Online lecture					
6. Number of Credit Hours (Total) / Number of Units (Total)					
93 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Dr. Omar S. Abdulwahid					
E-mail: omar.abdulwahid@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	<ol style="list-style-type: none"> <li>1. Student is able to recognize the underlying rule of differential equations in real world problems, [ I, VI, VII ]</li> <li>2. Student is able to classify the differential equations mathematically, the types of physical problems (IVP, BVP), and the difficulties of finding solutions. [ I, VI ]</li> <li>3. Student is able to solve 1st order, homogeneous and non-homogeneous, linear and nonlinear, ordinary differential equations, [ I, VI ]</li> <li>4. Student is able to solve 2nd order, homogeneous and non-homogeneous, linear ordinary differential equations, [ I, VI ]</li> <li>5. Student is able to make Laplace transforms of various kinds of functions, [ I, VI ]</li> <li>6. Student is able to use Laplace transforms to solve any order, homogeneous and non-homogeneous, linear ordinary differential equations. [ I, VI ]</li> </ol>				
9. Teaching and Learning Strategies					
Strategy	<ol style="list-style-type: none"> <li>1. Theoretical lectures</li> <li>2. Discussion sessions</li> <li>3. Computer Software</li> </ol>				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week1	6	I, VI, VII	Definition and Classification of differential equation (ordinary and partial, order, degree, Linear and non-linear, homogeneous and non-homogeneous).	1+2	HW + Seminar + Midterm

<b>Week2</b>	<b>6</b>	<b>I, VI</b>	Solutions of 1st order linear ordinary differential equations, homogeneous and non-homogeneous. General and particular solutions.	<b>1+2+3</b>	<b>HW + CW + midterm</b>
<b>Week3</b>	<b>6</b>	<b>I, VI</b>	Solutions of 1st order nonlinear ordinary differential equations, homogeneous and non-homogeneous, using the method of Separation of Variables and Exact and modified exact equations method.	<b>1+2+3</b>	<b>HW + CW + midterm</b>
<b>Week4</b>	<b>6</b>	<b>I, VI</b>	Solutions of 1st order nonlinear ordinary differential equations, homogeneous and non-homogeneous, using various methods of substitution.	<b>1+2+3</b>	<b>HW + CW + midterm</b>
<b>Week5</b>	<b>6</b>	<b>I, VI</b>	Various fields of applications of 1st order ordinary differential equations.	<b>1+2</b>	<b>HW + CW + Seminar + midterm</b>
<b>Week6</b>	<b>6</b>	<b>I, VI</b>	Solution of 2nd order, homogeneous, linear ordinary differential equations with constant coefficients.	<b>1+2+3</b>	<b>HW + CW + midterm</b>
<b>Week7</b>	<b>6</b>	<b>I, VI</b>	Solution of 2nd order, nonhomogeneous, linear ordinary differential equations with constant coefficients by the method of Undetermined coefficients.	<b>1+2+3</b>	<b>HW + CW + midterm</b>
<b>Week8</b>	<b>6</b>	<b>I, VI</b>	Solution of 2nd order, nonhomogeneous, linear ordinary differential equations with constant coefficients by the method of Variable of parameters.	<b>1+2+3</b>	<b>HW + CW + midterm</b>
<b>Week9</b>	<b>6</b>	<b>I, VI</b>	Possible solutions of boundary value problems. also, introduce the stability	<b>1+2+3</b>	<b>HW + CW + midterm</b>

			criteria of solution (its physical meaning in engineering systems). The dependence of stability and system behavior on the characteristic roots.		
<b>Week10</b>	<b>6</b>	<b>I, VI, VII</b>	Various fields of applications of second order ordinary differential equations with solutions.	<b>1+2</b>	<b>HW + CW + midterm</b>
<b>Week11</b>	<b>6</b>	<b>I, VI</b>	Laplace transform: definition, versatility and application, Laplace Inverse Transform, using tables and partial fractions. Application of Laplace transform definition on various Geometric functions.	<b>1+2</b>	<b>HW + CW + midterm</b>
<b>Week12</b>	<b>6</b>	<b>I, VI</b>	Laplace Transform of derivatives, solution of linear ordinary differential equations using Laplace Transforms, 1st-shifting theorem (Translation in S-domain).	<b>1+2+3</b>	<b>HW + CW + midterm</b>
<b>Week13</b>	<b>6</b>	<b>I, VI</b>	Unit step function and its Laplace Transform. 2nd shifting theorem (Translation in t-domain), Laplace Transforms of derivatives.	<b>1+2+3</b>	<b>HW + CW</b>
<b>Week14</b>	<b>6</b>	<b>I, VI</b>	Laplace transforms of integrals (t-function integral and S-function integral), Convolution Theorem.	<b>1+2+3</b>	<b>HW + CW</b>
<b>Week15</b>	<b>6</b>	<b>I, VI</b>	Practices of applying Laplace inverse transform on various special functions.	<b>1+2+3</b>	<b>HW + CW</b>

### 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.

<b>Assessment Type</b>	<b>Number / Duration</b>	<b>Marks</b>
<b>Quizzes</b>	2	10% (10 Marks)
<b>Assignments</b>	5	10% (10 Marks)

<b>Project / Lab</b>	1	10% (10 Marks)	
<b>Report</b>	1	10% (10 Marks)	
<b>Midterm Exam</b>	2 hr	10% (10 Marks)	
<b>Final Exam</b>	3 hr	50% (50 Marks)	
<b>Total</b>		<b>100% (100 Marks)</b>	

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	E. Kreyszig, et al, "Advanced Engineering Mathematics," 10th ed., McGraw Hill, 2011.
Main references (sources)	D.G. Zill, "Advanced Engineering Mathematics" 6th Ed, 2018.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
Fluid Mechanics	
2. Course Code:	
MTE 209	
3. Semester / Year:	
Second Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
63 hr/sem (SSWL: Structured Student Workload) / 4 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
Name: Dr. Loay B. Y. Aldabbagh Email: loayaldabbah@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<p>1) Understand the Fundamental fluid properties and their significance in Engineering and methods of fluid pressure measurement and calculation of forces on different surfaces. [I, VI].</p> <p>2) Know about the working of different types of devices used for the measurement of fluid flow [I, VI]</p> <p>3) Performs pressure center and hydrostatic force calculations. [ I ]</p> <p>4) Learn about the principles of designing dams and gates. Design of gate control systems. [I, II]</p> <p>5) Identify the types of flow, the conditions governing them, and general hypotheses. [I, VI]</p> <p>6) Apply the conservation of mass and energy and Newton's second law of motion to the contents of a finite control volume to get important answers. [ I ]</p> <p>7) Performs pressure and velocity calculations using the conservation of mass equation and the Bernoulli equation for flow systems. [I, II]</p>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<p>1-Theoretical lectures</p> <p>2-Discussion sessions</p>
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	<b>I,II</b>	Introduction; Fluid mechanics applications in science and mechatronics engineering; Matter; Solid and Fluid (liquid and Gas).	Theoretical lectures Discussion Sessions	Activity
2	4	<b>I,II</b>	Shear and normal stress, pressure; Definition of Fluid static and dynamic; Approaches to study fluid mechanics; Analytical method, Experiments, and Computation (Computation Fluid Dynamic, CFD); Definition of; Hydrodynamics, Hydraulics, Gas dynamics	Theoretical lectures Discussion Sessions	Assignment
3	4	<b>I,II</b>	Shear and normal stress, pressure; Definition of Fluid static and dynamic; Approaches to study fluid mechanics; Analytical method, Experiments, and Computation (Computation Fluid Dynamic, CFD); Definition of; Hydrodynamics, Hydraulics, Gas dynamics	Theoretical lectures Discussion Sessions	Quizzes
4	4	<b>I,II</b>	Fluid Properties; Mass Density, Specific Volume, Specific Weight, Specific Gravity; Idea Gas Law, Dynamic and Kinematic Viscosity, shear stress and velocity gradient, Newtonian and Non-Newtonian Fluids; Compressibility, Process (Isothermal and Isentropic)	Theoretical lectures Discussion Sessions	Activity
5	4	<b>I,II</b>	Fluid Static (Hydrostatics); Pressure definition; Pressure at a Point; Pressure Force on a Fluid Element,	Theoretical lectures Discussion Sessions	Assignment

			Equilibrium force of a Fluid Element; Body and Viscous force; Pressure variation in a Fluid at Rest for Incompressible and compressible Fluid.		
6	4	<b>II,VI</b>	Pressure Measurements; Barometer (Mercury and Aneroid Barometer), Piezometer Tube, U-Tube Manometer, Differential U-tube manometer, Inclined-tube manometer, Bourdon gage, Pressure transducers.	Theoretical lectures Discussion Sessions	Quizzes
7	4	<b>I,II,VI</b>	Pressure distribution on flat surface; Hydrostatic Force on an Inclined Plane Surface of Arbitrary shape; resultant force and location of center of pressure, centroid and parallel axis theorem.	Theoretical lectures Discussion Sessions	Activity
8	4	<b>II,VI</b>	Hydrostatic Force on Submerged Curve Surface	Theoretical lectures Discussion Sessions	Assignment
9	4	<b>I</b>	Mid. Course Exam.	Theoretical lectures Discussion Sessions	
10	4	<b>I,II</b>	Fluid Dynamics; Physical Quantities of Flow; Velocity, Pressure, Density, Temperature and Acceleration. Lagrangian and Eulerian Systems; Control volume method.	Theoretical lectures Discussion Sessions	Activity
11	4	<b>I,II</b>	Classification of Fluid Flow; Uniform and Non-uniform Flow, Steady and Unsteady Flow, One-, two- and three-dimensional flows, Viscous and Inviscid Flow, Internal and External Flow, Laminar and Turbulent Flow	Theoretical lectures Discussion Sessions	Assignment

			(boundary layer), Compressible and Incompressible		
12	4	<b>I,II</b>	Elementary Equation of Motion; Differential and Control Volume Approach.  Continuity Equation (Conservation of Mass) derivation, Volume and Mass Flow Rate, Momentum Flux, Applications on Conservation of Mass.	Theoretical lectures Discussion Sessions	Quizzes
13	4	<b>I,II,VI</b>	Bernoulli Equation; limitations and the assumptions, Pressure head, Velocity head, Elevation head, Piezometric head, Total head, Hydraulic and Energy Grade lines.  Application of the Bernoulli equation; Pitot Tube, Pitot- Static Tube (stagnation point), Fr	Theoretical lectures Discussion Sessions	Activity
14	4	<b>I,II</b>	The Linear Momentum Equation (conservation of linear momentum) derivation, Newton's second law, Body and surface forces, The three components force.  Application of the Linear Momentum Equation; steady-incompressible case, Flow on a pipe nozzle, Force due	Theoretical lectures Discussion Sessions	Assignment
15	4	<b>I</b>	Final course Exam.		

11.

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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)

<b>Project / Lab</b>	1	10% (10 Marks)
<b>Report</b>	1	10% (10 Marks)
<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	B.R. Munson, D.F. Young and T.H. Okiishi, Fundamentals of Fluid Mechanics, seventh edition, John Wiley & Sons, Inc., 2013
Main references (sources)	Frank M. White, Fluid Mechanics, seventh edition, McGraw-Hill, 2011
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

• Course Name:					
Mechanics of Material					
• Course Code:					
MTE 210					
• Semester / Year:					
Second Semester / 2025-2026					
• Description Preparation Date:					
1/9/2025					
• Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial)					
• Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 4 ECTS (European Credit Transfer and Accumulation System).					
• Course administrator's name					
Name: Asst. Lecturer Omar Abdulrahman Mohammed					
Email: <a href="mailto:omar.a.mohammed@uomosul.edu.iq">omar.a.mohammed@uomosul.edu.iq</a>					
• Course Objectives					
<b>Course Objectives</b>		Mechanics of materials (Strength of Materials) is a branch of applied mechanics that deals with the behaviour of solid bodies subjected to various types of loading and give the ability to calculate stresses, strains, shear stresses, shear strains, deformations, ... etc of objects under external loadings, as well as give the ability to increase the knowledge of strength of materials on engineering design and their applications.			
• Teaching and Learning Strategies					
<b>Strategy</b>		The course contributes to the following student outcomes: <ol style="list-style-type: none"> <li>1. Understand stress and strain in mechanical parts.</li> <li>2. Classifying the types of stresses happening in machine by using mathematical formula for stresses.</li> <li>3. Understand the basic concepts of mechanical properties for all materials.</li> <li>4. Learning about the thermal effect on mechanical parts using thermal strain formula.</li> <li>5. Understand the basic concepts of combined bar .</li> <li>6. Recognize the basic concepts of torsion in circular shafts and bars.</li> <li>7. Learning about how to draw the bending moment diagram and shear force diagram.</li> </ol>			
• Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>

1	4	A1 B1 C1	Introduction- Strength of Materials	lectures	
2	4	A1 B1 C1	Simple Stresses and Strains	lectures	
3	4	A1 B1 C1	Thermal Stresses.	lectures	Homework#1
4	4	A1 B1 C1	Shear stress and shear strain	lectures	
5	4	A1 B1 C1	Allowable Working Stress.	lectures	Quiz
6	4	A1 B1 C1	Compound bar subjected to external load.	lectures	
7	4	A1 B1 C1	Equivalent or combined modulus.	lectures	Homework#2
8	4	A1 B1 C1	Compound bar subjected to temperature change;	lectures	Quiz
9	4	A1 B1 C1	Mid-term Exam	lectures	
10	4	A1 B1 C1	Shearing Force and Bending Moment Diagrams	lectures	
11	4	A1 B1 C1	Point of Contraflexure	lectures	
12	4	A1 B1 C1	Relationship between S.F. and B.M. and intensity of loading.	lectures	Report
13	4	A1 B1 C1	Bending and shearing stress	lectures	

14	4	A1 B1 C1	Bending and shearing stress	lectures	
15	3	A1 B1 C1	Final Exam	lectures	Exam#2

• 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	20% (20 Marks)
Assignments	2	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

• Learning and Teaching Resources

Required textbooks (curricular books, if any)	E. J. Hearn. "Mechanics of Materials.
Main references (sources)	R. C. Hibbeler. "Strength of Materials.
Recommended books and references (scientific journals, reports...)	Beer "Mechanics of Materials.
Electronic References, Websites	

1. Course Name:					
Digital Logic Design					
2. Course Code:					
MTE 211					
3. Semester / Year:					
Second Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
, CL (Class Lecture), Lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 4 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Dr. Muhamad Azhar Abdilatif Alobaidy Email: muhamad.azhar@uomosul.edu.iq					
8. Course Objectives					
Course Objectives		<ol style="list-style-type: none"> <li>1) Adequate knowledge in digital system design concepts (I, II, III, VI).</li> <li>2) Ability to design and implement digital circuits under realistic constraints and conditions (I, II, III, IV, VI).</li> <li>3) Ability to debug, verify, simulate, synthesize digital circuits (I, II, III, VI, VII)</li> <li>4) Ability to devise, select, and use modern techniques and tools needed for digital system design (I, II, III, VII).</li> </ol>			
9. Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> <li>• Theoretical lectures</li> <li>• Discussion sessions</li> <li>• Laboratory experiments</li> </ul>			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I	Numerical System o Binary System o Octal System o Hexadecimal System	Theoretical lectures	HW
2	4	I	Numerical System Converting between Systems (Binary, Octal, Hexadecimal, Decimal)	Theoretical lectures	EXAM

			<ul style="list-style-type: none"> <li>o Mathematical Operations</li> <li>o Binary System Problems</li> </ul>		
3	4	<b>I</b>	<ul style="list-style-type: none"> <li>Logic Gates</li> <li>o Gates with their symbols and truth tables</li> <li>o Logical Operations</li> <li>o Timing Diagram for logic gates</li> <li>o Logic gates as switches</li> </ul>	Theoretical lectures	HW
4	4	<b>II</b>	<ul style="list-style-type: none"> <li>Logic Circuit Design</li> <li>o Logic circuit designing steps</li> <li>o Implementation of Logic circuits using truth tables</li> <li>o Implementation of logic circuits using equations</li> <li>o Converting logic circuit to logic equations</li> </ul>	Theoretical lectures	EXAM
5	4	<b>III, IV</b>	<ul style="list-style-type: none"> <li>Boolean Algebra and Identities</li> <li>o Basic Identification of Boolean algebra</li> <li>o Duals of Expressions</li> <li>o Demorgan's Theories</li> <li>o Truth tables for Demorgan</li> </ul>	Theoretical lectures/ Discussion sessions	CW
6	4	<b>I, II</b>	<ul style="list-style-type: none"> <li>Boolean Algebra and Identities</li> <li>Algebraic Manipulation</li> <li>o Simplifying Functions</li> <li>o Fewer Gates</li> <li>o Duality Properties</li> <li>o Complement of Functions</li> </ul>	Theoretical lectures	Exam
7	4	<b>I</b>	<ul style="list-style-type: none"> <li>Strategies of Minimizations</li> <li>o Terminology and Definitions</li> <li>o Guidelines of Simplifying Functions</li> </ul>	Theoretical lectures	HW

8	4	<b>II</b>	K-Map Simplifying SOP Procedures -Three Variable K-Map -Four Variable K-Map -Five Variable K-Map o Karnaugh Map POS Minimization -Three Variable K-Map -Four Variable K-Map -Five Variable K-Map o Getting between SOP and POS o Don't Care Conditions	Theoretical lectures/ Discussion sessions	CW
9	4	<b>III, VII</b>	Multiplexer o Definitions o Constructions o 2-1-multiplexer o 4-1-multiplexer 8-1-multiplexer o 16-1-multiplexer o 32-1-multiplexer o Realizing Logic Functions Efficiently o Larger Multiplexer o Cascading Multiplexer Circuits	Theoretical lectures	HW
10	4	<b>I, IV</b>	De-Multiplexer o Definitions o Applications o 1-4-demultiplexer o 1-8-demultiplexer o 1-16-demultiplexer o Timing Diagram o 1-m-demultiplexer o De-multiplexer as Decoder o Characteristics table of De-multiplexer	Theoretical lectures	EXAM
11	4	<b>I, II</b>	Decoder o Characteristics of Decoder o Construction of Decoder o Types of Decoders o 2-4-decoder o 3-8-decoder o 4-16 –decoder	Theoretical lectures	HW

			o Applications of Decoder o Expansions of Decoder		
12	4	I, VI	Encoder o Definitions o Types o Applications o Code Convertor o Binary to Gray Code Convertor	Theoretical lectures	CW
13	4	II	Adders and Subtractors Circuits o Half Adder o Full Adder o Binary Adder o Binary Subtractor o Binary Adder Subtractor	Theoretical lectures	EXAM
14	4	VII, V	Sequential Logic Circuits <ul style="list-style-type: none"> <li>• Latches and Some Definitions</li> <li>• Synchronous and Asynchronous Sequential Circuits</li> <li>• SR-Latches</li> <li>• SR-Latches as Memories</li> </ul> D-Latches	VII, V	HW
15	4	I, II, VI	Sequential Logic Circuits o JK-latches o T-Latches Counters	I, II, VI	CW

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Digital Logic and Computer Design by M Morris Mano
Main references (sources)	Digital Logic Design by Pu-Jen Cheng, Digital Logic Design by Nasser M. Sabah
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
Statistics					
2. Course Code:					
MTE 212					
3. Semester / Year:					
Second Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
, CL (Class Lecture), Tut (Tutorial)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Asst. Lecturer Ali Ayad Abduljabar E-mail: alibabeli@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	1. Introduce the student to collecting and presenting statistical data [I] 2. Classifying and tabular the engineering information in a manner consistent with the data and the field of academic work [I] 3. an ability to conduct experiments, analyze and interpret data [I, III, VI] 4. The ability to identify and solve engineering problems. [I, III, VI] 5. Take the appropriate decision through scientific analysis of information [I, III, VI]				
9. Teaching and Learning Strategies					
Strategy	1- Theoretical lectures 2- Discussion sessions 3- Assignments 4- Quizzes				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I	Role of statistics in science, types of statistics, data presentation	Theoretical lectures	
2	4	I	Descriptive statistics, histogram frequency distribution, data limits, data	Theoretical lectures	Quiz

			tabulations, polygon, ogive.		
3	4	<b>I, III, VII</b>	Basic Concepts of probabilistic theory (random events and sample space).	Theoretical lectures	<b>Activity</b>
4	4	<b>I</b>	Sets and probabilistic models, axioms of probability, rule of probability	Theoretical lectures	<b>Assignment</b>
5	4	<b>I</b>	The definition of conditional probability and their properties		<b>Quiz</b>
6	4	<b>I</b>	Multiplication rule, total probability theorem, Bayes' theorem	Theoretical lectures	
7	4		Midterm exam		
8	4	<b>I</b>	Three events, mutually and non-mutually events	Theoretical lectures	
9	4	<b>I</b>	Counting, permutation, combination	Theoretical lectures	<b>Activity</b>
10	4	<b>I</b>	The definition and classification of random variable (Discrete and Continuous), type of discrete distribution	Theoretical lectures	
11	4	<b>I</b>	Discrete probability distributions, Binomial and Poisson Distribution	Theoretical lectures	<b>Assignment</b>
12	4	<b>I</b>	Continuous distribution, normal distribution	Theoretical lectures	<b>Quiz</b>
13	4	<b>I, III, VII</b>	Test of hypothesis, types of errors in hypothesis testing, hypothesis tests of means	Theoretical lectures	<b>Assignment</b>
14	4	<b>I, III, VII</b>	Test of the mean with unknown population variance, hypothesis test of two means with known population variance.	Theoretical lectures	<b>Activity</b>
15	4		Final exam		
11.					

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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Introduction to Probability and Statistics for Engineers, Holický, Milan
Main references (sources)	الراوي، خاشع محمود. 1989 المدخل الى الاحصاء. وزارة التعليم العالي والبحث العلمي. جامعة الموصل.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
Signals and Systems	
2. Course Code:	
MTE 213	
3. Semester / Year:	
Second Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
33 hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Trans and Accumulation System).	
7. Course administrator's name	
Name: Dr. Zahraa Tarik Mohammad A. E-mail: <a href="mailto:zahraata.eng@uomosul.edu.iq">zahraata.eng@uomosul.edu.iq</a>	
8. Course Objectives	
<b>Course Objectives</b>	<p style="text-align: right;">The objective of this course is to:</p> <ul style="list-style-type: none"> <li>• Classify signals according to a variety of criteria including continuous, discrete, periodic, aperiodic, even, odd, power, and energy, and represent both signals and systems in multiple forms. <b>(Link to GO I)</b></li> <li>• Perform different operation on signals including shifting and scaling used in different application, Understand and analyze systems interconnection and block diagrams to be able to modify or build systems. <b>(Link to GO I, II, IV)</b></li> <li>• Understand the basics of sampling theorem, and the Nyquist theorem and study their effects, display aliasing problem and solution, as well as quantization, coding and their application in real world. <b>(Link to GO I, II, VI)</b></li> <li>• Know and identify the types of discrete time signals types in terms of graphical, functional, tabular, and sequential (vector), as well as perform signal manipulation, including amplitude scaling, amplitude shifting, sum of two signals, and product of two signals. <b>(Link to GO I, II, IV)</b></li> <li>• Define, state and identify system properties of linearity, time (in)variance, causality, memory and stability. <b>(Link to GO I, II)</b></li> <li>• Perform the basic operations and characterization on Linear Time Invariant systems including convolution, de-convolution, and correlation, and understand modern digital signal processing and its advantages, disadvantages, and application <b>(Link to GO I, II, IV, VI)</b></li> <li>• Describe the concept and techniques for performing signal modulation and analyse the performance of Amplitude Modulation (AM), Phase</li> </ul>

	Modulation (PM), and Frequency Modulation (FM). ( <a href="#">Link to GO I, II, IV,VI</a> )				
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>	<ol style="list-style-type: none"> <li>1. Theoretical lectures</li> <li>2. Discussion sessions (Activities)</li> <li>3. Tutorial sheets</li> <li>4. Exam and Quizzes</li> <li>5. Assignments</li> </ol>				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	<b>I, VI</b>	Introduction, the basic definition of signals and their main types with examples (continuous and discrete-time signals)	Lecture	<b>Assignment</b>
2	2	<b>I, VI</b>	Introduction to systems and their types and application examples	Lecture	<b>Assignment</b>
3	2	<b>I</b>	Classification of signals: (continuous-discrete), (analog-digital), (periodic – aperiodic), and (causal– noncausal)	Lecture	<b>Assignment</b>
4	2	<b>I</b>	Classification of signals: (even – odd), (power – energy), (deterministic – random), and (finite - infinite length)	Lecture	<b>Activity</b>
5	2	<b>I, II</b>	Signal operation: shifting, scaling (time and value), inversion (time and value), and combined operation. Signal useful function: unit step (continuous and discrete), ramp, unit impulse (with properties), triangular and complex exponential (continuous and discrete)	Lecture	<b>Tutorial sheet</b>
6	2	<b>I, II, IV</b>	Signal expression and representation: graphical form, functional form, and equation form + Signals construction	Lecture	<b>Quiz</b>

7		<b>I, II</b>	<b>Mid-term Exam</b>	Lecture	<b>Midterm Exam</b>
8	2	<b>I, II, VI</b>	Sampling theorem: Nyquist low and aliasing problem with solution		<b>Activity</b>
9	2	<b>I, II, VI</b>	Introduction to Quantization and Coding	Lecture	<b>Tutorial sheet</b>
10	2	<b>I, II, IV</b>	Discrete-time signal representation types: graphical, functional, tabular, and sequential (vector), Elementary discrete time signal with classification and manipulation	Lecture	<b>Activity</b>
11	2	<b>I, II, IV</b>	Description and classification of the system with interconnection & block representation)	Lecture	<b>Quiz</b>
12	2	<b>I, VI</b>	Introduction to the linear time-invariant system (LTIS) with conditions and System properties (linearity, time-invariant, causality, stability, and memory)	Lecture	<b>Tutorial sheet</b>
13	2	<b>I, II, IV, VI</b>	Convolution operation and methods: graphical, table look-up, vector by a matrix, add overlap, and analytical method with image (matrix) convolution.	Lecture	<b>Activity</b>
14	2	<b>I, II, IV, VI</b>	Deconvolution method: iterative, polynomial, and graphical method, Correlation types and application: quantitative correlation, cross-correlation, and auto-correlation	Lecture	<b>Quiz</b>
15	2	<b>I, II, IV, VI</b>	Modulation: reason, classification, and types (amplitude, frequency, phase, and spread spectrum), Modern digital signal processing advantages, disadvantages, and applications		<b>Activity</b>

16	3	I, II	Final Exam	Final exam
<b>11.Course Evaluation</b>				
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.				
<b>Assessment Type</b>		<b>Number / Duration</b>		<b>Marks</b>
<b>Quizzes</b>		2		10% (10 Marks)
<b>Assignments</b>		5		10% (10 Marks)
<b>Project / Lab</b>		1		10% (10 Marks)
<b>Report</b>		1		10% (10 Marks)
<b>Midterm Exam</b>		2 hr		10% (10 Marks)
<b>Final Exam</b>		3 hr		50% (50 Marks)
<b>Total</b>				<b>100% (100 Marks)</b>
<b>12.Learning and Teaching Resources</b>				
Required textbooks (curricular books, if any)				
Main references (sources)		<ul style="list-style-type: none"> <li>• Simon Haykin and Barry Van Veen, "Signals and systems", Wiley 2005</li> <li>• Oppenheim, Willsky, &amp; Young, "Signals and Systems", Prentice-Hall, 1996</li> </ul>		
Recommended books and references (scientific journals, reports...)		<ul style="list-style-type: none"> <li>• Benoit Boulet, "Fundamentals of signals and systems", Charles River Media 2006</li> <li>• James H., Ronald W., Mark A. "Signal Processing First", Pearson Education, Inc, Pearson Prentice Hall 2003</li> </ul>		
Electronic References, Websites				

1. Course Name:	
Computer 2	
2. Course Code:	
UOM 2032	
3. Semester / Year:	
Second Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Lab (Laboratory)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
48 hr/sem (SSWL: Structured Student Workload) / 3 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
Name: Dr. Mohammed Falah Mohammed	
Email: Mohammed.falah_kanna@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	<p>Student successfully completing this course will be able to:</p> <ol style="list-style-type: none"> <li>1. <b>Knowledge and Understanding (GO I)</b> <ul style="list-style-type: none"> <li>• <b>Demonstrate an intermediate understanding of core concepts in computer troubleshooting, networking, and cybersecurity, including encryption and decryption techniques.</b></li> <li>• <b>Explain the principles and applications of artificial intelligence, highlighting its relevance to mechatronics engineering and modern technologies.</b></li> </ul> </li> <li>2. <b>Practical Skills (GO III)</b> <ul style="list-style-type: none"> <li>• <b>Apply Python programming to solve engineering problems, including file encryption, image processing, and basic AI implementations.</b></li> <li>• <b>Use AI tools and libraries to develop simple models and automate processes relevant to mechatronics applications, such as data analysis and machine learning.</b></li> </ul> </li> <li>3. <b>Lifelong Learning and Engineering Application (GO VI)</b> <ul style="list-style-type: none"> <li>• <b>Develop the ability to independently acquire new knowledge and skills in emerging fields like artificial intelligence, cybersecurity, and their integration into mechatronics systems.</b></li> </ul> </li> </ol>
9. Teaching and Learning Strategies	
Strategy	1-Theoretical lectures

2-Discussion sessions

3-Projects

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3	III, VI	<p><b>Course Introduction &amp; Overview</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ Course objectives, expectations, and grading criteria.</li> </ul> </li> </ul> <p>Brief overview of key areas: AI, security, networking, and troubleshooting.</p>	Theoretical lectures and Lab	Discussion
Week 2	3	III, VI	<p><b>Computer Troubleshooting</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ Basic hardware and software troubleshooting techniques.</li> </ul> </li> </ul> <p>Diagnostic tools and methods.</p>	Theoretical lectures and Lab	Discussion
Week 3	3	III, VI	<p><b>Introduction to Networking</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ Networking basics: LAN, WAN, wireless networks, and VPNs.</li> </ul> </li> </ul> <p>Overview of IP addresses, DNS, and common network tools.</p>	Theoretical lectures and Lab	Activity
Week 4	3	III, VI	<p><b>Introduction to Security</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ Types of cyberattacks (e.g., phishing, malware, DDoS).</li> </ul> </li> </ul> <p>Protection measures (antivirus, firewalls, and secure practices).</p>	Theoretical lectures and Lab	Quiz
Week 5	3	III, VI	<p><b>Encryption and Decryption</b></p>	Theoretical lectures	Discussion

			<ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ Basics of encryption (symmetric and asymmetric).</li> </ul> </li> </ul> <p>Practical examples: Caesar cipher and public-key encryption (RSA).</p>	and Lab	
<b>Week 6</b>	3	III, VI	<p><b>Introduction to Artificial Intelligence</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ What is AI? Differences between AI, ML, and deep learning.</li> <li>○ History of AI and its major milestones.</li> </ul> </li> </ul>	Theoretical lectures and Lab	Discussion
<b>Week 7</b>	3	III, VI	<p><b>PAI in Daily Life</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ Everyday AI applications: smart assistants, search engines, recommendation systems.</li> </ul> </li> </ul> <p>AI's role in optimizing daily tasks.</p>	Theoretical lectures and Lab	Activity
<b>Week 8</b>	3		<b>Midterm Exam</b>		
<b>Week 9</b>	3	III, VI	<p><b>Applications of AI (Part D)</b>  <b>Focus:</b> AI in Healthcare, Education, and Environmental Conservation.</p>	Theoretical lectures and Lab	Lab Assessment Evaluation
<b>Week 10</b>	3	III, VI	<p><b>Applications of AI (Part II)</b>  <b>Focus:</b> AI in Business, Finance, and Marketing.</p>	Theoretical lectures and Lab	Quiz
<b>Week 11</b>	3	III, VI	<p><b>Applications of AI (Part III)</b>  <b>Focus:</b> AI in Creative Arts, Gaming, and Autonomous Systems (self-driving cars, drones).</p>	Theoretical lectures	Research + Report
<b>Week 12</b>	3	III, VI	<p><b>Ethical Challenges in AI</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b></li> </ul>	Theoretical lectures	Discussion

			<ul style="list-style-type: none"> <li>○ <b>Bias in AI systems, privacy concerns, and algorithm transparency.</b></li> </ul> <p><b>The impact of AI on jobs and social inequalities.</b></p>		
<b>Week 13</b>	3	III, VI	<p><b>AI and Society</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ <b>How AI is reshaping industries and societal structures.</b></li> </ul> </li> </ul> <p><b>Opportunities and challenges in democratizing AI.</b></p>	Theoretical lectures	Discussion
<b>Week 14</b>	3	III, VI	<p><b>The Future of AI</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ <b>Emerging AI trends: generative AI, quantum AI, and AI in space exploration.</b></li> </ul> </li> </ul> <p><b>Long-term challenges: aligning AI with human values, preventing misuse.</b></p>	Theoretical lectures	Discussion
<b>Week 15</b>	3	III, VI	<p><b>Course Wrap-Up and Review</b></p> <ul style="list-style-type: none"> <li>• <b>Topics:</b> <ul style="list-style-type: none"> <li>○ <b>Recap of key topics and insights.</b></li> </ul> </li> </ul> <p><b>Discussion on career opportunities in AI and related fields.</b></p>	Theoretical lectures	Discussion
<b>Week 16</b>			<b>Final Exam</b>		

### 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.

<b>Assessment Type</b>	<b>Number / Duration</b>	<b>Marks</b>
<b>Quizzes</b>	2	10% (10 Marks)
<b>Assignments</b>	5	10% (10 Marks)
<b>Project / Lab</b>	1	10% (10 Marks)
<b>Report</b>	1	10% (10 Marks)
<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)

<b>Total</b>		<b>100% (100 Marks)</b>
<b>12.Learning and Teaching Resources</b>		
Required textbooks (curricular books, if any)	2015 Computer Literacy BASICS: A Comprehensive Guide to IC3 Connie Morrison, Dolores Wells, Lisa Ruffolo Cengage Learning. ISBN: 128576658X	
Main references (sources)	Toussaint, M. (2014). <i>Introduction to Artificial Intelligence</i> . University of Stuttgart.	
Recommended books and references (scientific journals, reports...)	Sharma, R. K. (2013). Computer Networking Fundamentals.	
Electronic References, Websites		

1. Course Name:	
Arabic language2	
2. Course Code:	
UOM 2012	
3. Semester / Year:	
Second Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture),	
6. Number of Credit Hours (Total) / Number of Units (Total)	
33 hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
Name: Dr. Manal Ayad Ali Hussen Email: manal.a.a@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> <li>• <b>Learning the fundamentals of Arabic grammar.</b></li> <li>• <b>Equipping the student with Arabic writing skills</b> by correcting common writing errors and mastering the grammatical and orthographic rules that protect speech and writing from mistakes.</li> <li>• <b>Ensuring the student understands the importance of the Arabic language</b> and its rules within humanistic studies and in the drafting of research papers and reports.</li> <li>• <b>Developing the learner's ability to speak in Arabic</b> as much as possible.</li> <li>• <b>Providing the learner with linguistic material</b>, intellectual concepts, and orthographic, grammatical, and semantic knowledge to enable them to understand and comprehend texts and apply them to various modes of speech.</li> <li>• <b>Enabling the student to achieve correct and fluent reading.</b></li> </ul>
9. Teaching and Learning Strategies	
Strategy	<ul style="list-style-type: none"> <li>• Discussion Seminars.</li> <li>• Creating an interactive lecture between the student and the professor during the presentation of the material.</li> <li>• Using PowerPoint presentations to clarify lesson topics.</li> <li>• Assigning students with specific activities and homework.</li> </ul>
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1: The student defines the word and then mentions its parts (Noun – Verb – Particle)	Arabic Language / Parts of Speech and their definitions	Lectures and Reports	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
2	2	A4: The student distinguishes between Hamzat al-Qat' and Hamzat al-Wasl in pronunciation and writing	Pronunciation of Hamzat al-Qat' and al-Wasl	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
3	2	A5: The student distinguishes the basic rules for writing the Hamza correctly	Rules of writing the Hamza	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
4	2	A4: The student distinguishes in writing the tied Ta' (Ta' Marbuta) and the open Ta' (Ta' Maftuha) at the end of nouns	Writing the Ta' at the end of the word	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
5	2	B6: The student searches in dictionaries for the steps that must be followed when needing to know the meaning of a word	Method of searching for words in Arabic dictionaries	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
6	2	A5: The student distinguishes and	The Mabni and the Mu'rab and signs of	Lectures	Daily exams, Assignments,

		clarifies the difference between the indeclinable (Mabni) and declinable (Mu'rab) and the original and subsidiary signs of parsing	original and subsidiary parsing		Discussion and solving exercises during the lecture, Student interaction
7	2	<b>A2:</b> The student understands the two main parts of the nominal sentence (Subject and Predicate)	The Nominal Sentence (Al-Jumla al-Ismiyya)	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
8	2	<b>C1:</b> The student clarifies the main differences between verbs of proximity, hope, and beginning, and their function in the nominal sentence	Verbs of Proximity, Hope, and Beginning (Af'al al-Muqaraba, al-Raja', and al-Shuru')	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
9	2	<b>A5:</b> The student distinguishes between declinable and indeclinable numbers, as well as between definite and indefinite nouns	Rules of Numbers: Parsing, Construction, and Definiteness/Indefiniteness	Solving Exercises	Oral Exam
10	2	<b>A1:</b> The student recognizes the importance of punctuation marks in writing	Punctuation Marks	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
11	2	<b>B2:</b> The student demonstrates the difference between spelling errors and	Linguistic Errors	Lectures	Daily exams, Assignments, Discussion and solving exercises

		linguistic errors in writing			during the lecture, Student interaction
12	2	<b>A2:</b> The student explains deficient verbs and the changes they cause to the nominal sentence upon entering it	Deficient Verbs (Al-Af'al al-Naqisa)	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
13	2	<b>C7:</b> The student demonstrates the difference in pronunciation between the letters Daad (ض) and Zaa (ظ)	Pronunciation and Writing of Daad and Zaa	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
14	2	<b>A2:</b> The student classifies the difference between the defective, shortened, and extended nouns	Morphological Variation	Lectures	Daily exams, Assignments, Discussion and solving exercises during the lecture, Student interaction
15	2	<b>B8:</b> Writes a brief overview of the elements of poetry	Poetry and its types	Lectures	Homework

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

النحو الوافي – عباس حسن

Main references (sources)	كتاب النحو المبسط للشيخ أدهم العاسمي
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

**Study Courses of the Department of Mechatronics Engineering /  
College of Engineering / University of Mosul  
Third Level / Bologna Process Track**

Level	Semester No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)					Exam hr/sem	SSWL nr/se m	USSW nr/se m	SWL nr/se m	ECTS e	Module Type	Prerequisite (Modules)	
						CL (hr/w)	lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)								Sem (hr/w)
Five	1	MTE 301	Measurement and Instrumentation	القياسات والقياسات	English	2		2				3	63	37	100	4.00	C	
	2	MTE 302	Control System	نظم السيطرة	English	3	1	2				3	93	57	150	6.00	C	MTE 208
	3	MTE 303	Signal Processing	معالجة الإشارة	English	4				2		3	93	57	150	6.00	C	
	4	MTE 304	Microprocessors & Assembly Language	المعالجات الدقيقة ولغة التجميع	English	2	1	2		1		3	93	57	150	6.00	C	
	5	MTE 305	Mechanical Engineering Laboratory	مختبر الهندسة الميكانيكية	English				2			3	33	17	50	2.00	C	
	6	MTE 306	Theory of Machines	نظرية الآلات	English	3	1			1		3	78	72	150	6.00	C	MTE 202
					Total	14	3	8	0	4	0	18	453	297	750	30.00		
UGIII Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)					Exam hr/sem	SSWL nr/se m	USSW nr/se m	SWL nr/se m	ECTS e	Module Type	Prerequisite (Modules)	
	1	MTE 307	Heat Transfer	انتقال حرارة	English	3				1		3	63	62	125	5.00	C	MTE 206
	2	MTE 308	Hydraulic & Pneumatic Systems	الأنظمة الهيدروليكية والبريائية	English	2		2				3	63	62	125	5.00	C	MTE 209
	3	MTE 309	Computer Aided Machine Design	تصميم الآلة بمساعدة الحاسوب	English	2		2				3	63	62	125	5.00	C	MTE 202
	4	MTE 310	Microcontroller System Design	تصميم نظام التحكم المدمج	English	2		2				3	63	62	125	5.00	C	MTE 304
	5	MTE 311	Numerical Methods	الطرق العددية	English	3				1		3	63	62	125	5.00	B	MTE 109
6	MTE 312	Power Electronics and Drive	إلكترونيات القدرة و المحركات	English	2		1			1	3	63	62	125	5.00	C	MTE 204	
					Total	14	0	7	0	3	0	18	378	372	750	30.00		

1. Course Name:					
<b>Measurement and Instrumentations</b>					
2. Course Code:					
<b>MTE 301</b>					
3. Semester / Year:					
First Semester 2026-2025					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 4 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Dr. Mohammed Yaseen E-mail: <a href="mailto:mohammed.alnuaimi@uomosul.edu.iq">mohammed.alnuaimi@uomosul.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		The students who finish this course will be able:			
		1.To work with different components of modern measurement systems (Go I, II)			
		2.To understand the instrumentations concepts as parts of control system field. (Go I,II, III)			
		3.To perform different experiments using different types of sensors. (Go I, III, VI)			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Theoretical lectures 2-Discussion sessions 3-Laboratory experiments 4-Projects			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	I	Units and Dimensions, type of instruments	Lecture	
2	2	I	Characteristics of instrument or transducers, Static and dynamic characteristics	Lecture	Homework
3	2	I	Errors in measurement systems, Sources of	Lecture	Quiz

			measurement noise, Techniques for reducing measurement noise		
4	2	I	Sensors and Transducers, Sensor Categories, Position and displacement Transducer	Lecture	
5	2	I, II, VII	Resistance, inductance and capacitance measurement	Lecture	Quiz
6	2	I	Bridge circuits	Lecture	
7	2	I, II, VII	Current measurement, frequency and phase measurement	Lecture	Homework
8	2	I	Strain gauges, Force Sensors.	Lecture	
9	1	I	Midterm exam		
10	2	I, II, VII	Torque sensors and design problem on strain gauges.	Lecture	
11	2	I, II, VII	Rotational motion transducers, Rotational displacement and velocity, Absolute angular displacement and Velocity, Gyroscope	Lecture	
12	2	I	Capacitive, resistive and magnetic sensors, Hall effect sensor	Lecture	Quiz
13	2	I	Piezoelectric transducers, Ultrasonic transducers range and level measurement	Lecture	Homework
14	2	I	Level measurement and Pressure measurement	Lecture	
15	3	I	Final Exam		
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	III	Units and Dimensions, type of instruments	Laboratory experiment s	
2	2	III	Characteristics of instrument or transducers, Static and dynamic characterstics	Laboratory experiment s	Lab Reports
3	2	III	Errors in measurement systems, Sources of measurement noise, Techniques for reducing measurement noise	Laboratory experiment s	Lab Reports

4	2	III	Sensors and Transducers, Sensor Categories, Position and displacement Transducer	Laboratory experiments	Lab Reports
5	2	III	Resistance, inductance and capacitance measurement	Laboratory experiments	Lab Reports
6	2	III	Bridge circuits	Laboratory experiments	Lab Reports
7	2	III	Current measurement, frequency and phase measurement	Laboratory experiments	Lab Reports
8	2	III	Strain gauges, Force Sensors.	Laboratory experiments	Lab Reports
9	1	I	Midterm exam		Lab Midterm Exam
10	2	III	Experiment #7 Measurement of Force and Torque using different types of sensors.	Laboratory experiments	Lab Reports
11	2	III	Experiment #8 Measurement of rotational velocity and displacement.	Laboratory experiments	Lab Reports
12	2	III	Experiment #9 Measurement of displacement using proximity magnetic sensors and Hall effect sensor.	Laboratory experiments	Lab Reports
13	2	III	Experiment #10 Measurement of temperature and humidity using different types of sensors.	Laboratory experiments	Lab Reports
14	2	III	Experiment #11 Measurement range using ultrasonic transducers	Laboratory experiments	Lab Reports
15	3	I	Final Exam		Final Lab Exam

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab Report	8	8%
Midterm lab	1	3%
Midterm Exam	1	7%
Final Exam	1	20%
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>“Measurement and Instrumentation Principles” Third edition, by Alan S. Morris, 2001</li> </ul>
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	<ul style="list-style-type: none"> <li>• “Introduction to Instrumentation Measurement”, Second Edition by Robert B. Northrop, 2011.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>• “The Measurement Instrumentation and Sensors Hand Book” by John G. Webster</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Control Systems</b>					
2. Course Code:					
<b>MTE302</b>					
3. Semester / Year:					
First Semester 2026-2025					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial), Lect (Online lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
93 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: dr. Omar Ahmed E-mail: omar.ahmed.j@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>		Student who finish this course should: 1-Define and explain feedback and feed-forward control architecture and discuss the importance of performance, robustness and stability in control design [I] 2-Interpret and apply block diagram representations of control systems and design PID controllers based on empirical tuning rules [ I II III VI] 3-Compute stability of linear systems using the Routh array test and use this to generate control design constraints [I III] 4-Use Evans root locus techniques in control design for real world systems [I II III VI] 5-Compute gain and phase margins from Bode diagrams .[ I II II VI] 6-Design Lead-Lag compensators based on frequency data for an open-loop linear system.[ I II III VI]			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Theoretical lectures 2-Discussion sessions 3-Laboratory experiments			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	6	I	Introduction to control system.	Theoretical lectures	HW

2	6	I	Mathematical model of physical system, mechanical system I.	Theoretical lectures	HW
3	6	I	Mathematical model of physical system, electrical system II.	Theoretical lectures	HW
4	6	I	Block diagram, Block diagram reduction.	Theoretical lectures	HW
5	6	I	Closed loop system subjected to disturbance, multivariable system	Theoretical lectures	HW
6	6	I	Signal flow graph representation, mason gain formula	Theoretical lectures	Exam
7	6	I III	Modeling in state space	Theoretical lectures	HW
8	6	I III	Transient response analysis, First order system	Theoretical lectures	HW
9	6	I III	Transient response analysis, second order system, Damping ratio and natural frequency	Discussion sessions	CW
10	6	I III	Definition of transient response, specifications, impulse response and dominant poles	Theoretical lectures	HW
11	6	I III	Steady- state error in unity feedback.	Theoretical lectures	Exam
12	6	I VI	Routh stability criterion	Discussion sessions	CW
13	6	I III	Introduction To Frequency Response	Theoretical lectures	HW
14	6	I II III VI	Root Locus Analysis	Discussion sessions	CW
15	6	I II VI	Construction Method of Bode Plot and Asymptotic.	Theoretical lectures	Exam

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%

<b>Total</b>	<b>100% (100 Marks)</b>
<b>12. Learning and Teaching Resources</b>	
Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Automatic Control System, Farid Golnarag and Benjamin C. Kuo</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>In the library, there are many control systems books that can be used as reference books.</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Signal processing</b>					
2. Course Code:					
<b>MTE 303</b>					
3. Semester / Year:					
First Semester 2026-2025					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
93 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
Name: Dr. Muhamad Azhar					
E-mail: <a href="mailto:muhamad.azhar@uomosul.edu.iq">C:\Users\Lenovo\iCloudDrive\هندسة ميكاترونكس\جودة\muhamad.azhar@uomosul.edu.iq</a> muhamad.azhar@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>		1-Deal with basic digital processing techniques for the mechatronic system.[I,II,V] 2-Learn Z- and Discrete Fourier transforms and their application. [II,III,V] 3-Design FIR and IIR digital filters to meet arbitrary specifications. [I,II,VI] 4-Design and implement digital signal processing algorithms for various applications. [III,VI,VII]			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Theoretical lectures 2-Discussion sessions 3-Projects			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	6	I,II	Introduction to signal processing	Theoretical lectures	HW
2	6	I,II,V	Analaog and Digital Signal Processing 1- ADC blocks	Theoretical lectures	EXAM

			2-Sampling Theorem 3-Example		
3	6	I,II, VI	D. Signals Representation 1-Graphical representation 2-Functional representation 3-Tabular representation 4-Sequential (Vector) representation Common D. Signals 1- Unit step signal 2- Impulse signal 3- Ramp signal 4- Exponential signal	Theoretical lectures	HW
4	6	I,VII	Discrete time signals manipulation 1-Shifting 2-Reversal 3-Time Scaling 4-Addition 5-Amplitude scaling 6-Multiplication 7-Unit delay element & Unit advance	Theoretical lectures	EXAM
5	6	I, VII	DISCRETE-TIME SYSTEMS 1-discrete-time systems as blocks 2-discrete-time systems types	Theoretical lectures/ Discussion sessions	CW
6	6	I, VI,VII	Properties of DISCRETE-TIME SYSTEM 1-System Causality 2-System stability 3-Linear Systems 4-Time invariant system 5-LTI Systems	Theoretical lectures	Exam
7	6	I, VI,VII	Convolution 1-Convolution utilization 2-Convolution conditions 3-Methods of Convolution	Theoretical lectures/ Discussion sessions	HW

			4-Graphical Method Convolution		
8	6		Convolution (cont.) 1-Methods of Convolution	Theoretical lectures/ Discussion sessions	CW
9	6	I,II,V	2-Slide Rule Method Deconvolution 1-Methods of Deconvolution 2-Iterative Method 3-The Graphical Method  Term Exam	Theoretical lectures/ Discussion sessions	HW
10	6	I, V	Linear Constant-Coefficient Difference Equations 1-Solution of First-order LCCDE 2-Solution of Nth - order LCCDE	Theoretical lectures	EXAM
11	6	I,II,V	Z-Transform, properties, examples on classical discrete-time signals, ROC and inverse Z-Transform	Theoretical lectures	HW
12	6	I,II,V	Discrete-time LTI system analysis using the Z-variable. System function and its relationship to other forms of time- and frequency-domain representations.	Theoretical lectures	CW
13	6	I, V	Digital Filters: IIR and FIR filters, stability and linear-phase properties of FIR filters against fast roll-off and low order properties of IIR filters.	Theoretical lectures	EXAM
14	6	I,II,V	Design of IIR filters: numerical methods, IIR digital filters via bilinear transformation of	Theoretical lectures	HW

			classical analogue filters (Butterworth, Chebyshev, and elliptic), and impulse invariant method.		
15	6	I,II,V	Design of FIR filters: windowing and frequency sampling method. Realizations of IIR and FIR filters.	Theoretical lectures	CW

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>“Discrete-Time Signal Processing,” Alan V. Oppenheim, Ronald W. Schaffer and John R. Buck second edition 1999, ISBN 0-13-754920-2</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>“Signal Processing First,” James H. McClellan, Ronald W. Schaffer, Mark A. Yoder, Pearson/ Prentice Hall, c20032003 ISBN 0130909998.</li> <li>“Digital Signal Processing: Principles, Algorithms, and Applications,” John G. Proakis, Dimitris K Manolakis, 1995.</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Microprocessors &amp; assembly language</b>					
2. Course Code:					
<b>MTE 304</b>					
3. Semester / Year:					
First Semester 2026-2025					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial), Lab (Laboratory), Lect (Online lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
93 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
1- Name: Dr. Ali Abduljalil Abdulla E-mail: ali.alkurukchi@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>		The objective of this course is to:			
		<p><b>1- Link to GO I</b> Have deep understanding of microprocessor systems and its internal architectures, memory design, and IO design. This objective will achieve through the Quizzes, Midterm exam and Final exam.</p> <p><b>2- Link to GO II &amp; III</b> Gain an ability to develop an Assembly program. This objective will achieve the GOII &amp; III through the Assignment, and Activity.</p> <p><b>3- Link to GO III</b> Gain an ability to Design a complete microprocessors system which include(addressing, buffering, latching, and decoding).</p>			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Theoretical lectures 2-Discussion sessions 3-Laboratory experiments 4-Assignment 5-Exam 6- Projects			
10. Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>

1	6	I	Introduction to the microprocessors and microcomputers	Theoretical Lectures	
2	6	I	The Microarchitectures and software model of 8086 microprocessors	Theoretical Lectures	<b>Homework</b>
3	6	I	addressing mode	Theoretical Lectures	
4	6	I	Data transfer instructions	Theoretical Lectures	<b>Quiz</b>
5	6	I	Unsigned number and their mathematics instructions	Theoretical Lectures	
6	6	II,III	Signed number and their mathematics instructions	Theoretical Lectures	<b>Discussion</b>
7	6	I,III	Mid-Term Exam		<b>Mid_Term Exam</b>
8	6	I	Control instructions	Theoretical Lectures	
9	6	I	Shift and rotate statements and instructions	Theoretical Lectures	
10	6	I	Formulation and creation of assembly Loops.	Theoretical Lectures	<b>Quiz</b>
11	6	I	The Subroutines in 8088/8086 assembly Language.	Theoretical Lectures	<b>Homework</b>
12	6	II,III	<b>Memory and memory interfacing</b>	Theoretical Lectures	<b>Discussion</b>
13	6	I	<b>I/O address decoding</b>	Theoretical Lectures	
14	6	II,III	<b>I/O design</b>	Theoretical Lectures	<b>Discussion</b>
15	6	II,III	Discussion of the student projects.		

### 11.Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

### 12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Walter A. Triebel, Avtar Singh, "The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications", Fourth Edition, Pearson Education Ltd, 2014.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>W. Triebel, A. Singh, "The 8088 and 8086 Microprocessors", Fourth Edition, Pearson Education Ltd, 2018.</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Mechanical engineering laboratory</b>					
2. Course Code:					
<b>MTE 305</b>					
3. Semester / Year:					
First Semester 2026-2025					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
Lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
33 hr/sem (SSWL: Structured Student Workload) / 2 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name (mention all, if more than one name)					
Name: Dr. Loay Bashir E-mail: loayaldabbagh@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>		1) Identify measuring devices and how they work. [ III]. 2) An ability to properly compose a technical report.. [ IV]. 3) An ability to conduct experiments in the areas of Mechanical Engineering. [ III, VII ]. 4) Gain the necessary experience to compare practical results with theory. [ I ] 5) An ability to work adequately on teams and to set up objectives, p activities, and meet due dates. [VII].			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1- Theoretical lectures 2- Laboratory experiments			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	<b>I, III, IV, VII</b>	Friction on Inclined Plane	Theoretical lectures Laboratory experiments	Lab. Work Experiment report
2	2	<b>I, III, IV, VII</b>	Torsion of Bar	Theoretical lectures Laboratory experiments	Lab. work Experiment report.
3	2	<b>I, III, IV, VII</b>	Hook's Law	Theoretical lectures	Lab. Work Experiment report

				Laboratory experiments	
4	2	<b>I, III, IV, VII</b>	Reaction of Beams	Theoretical lectures Laboratory experiments	Lab. work Experiment report.
5	2	<b>I, III, IV, VII</b>	Impact Test	Theoretical lectures Laboratory experiments	Lab. Work Experiment report
6	2	<b>I, III, IV, VII</b>	Fatigue Test	Theoretical lectures Laboratory experiments	Lab. work Experiment report.
7	2	<b>I, III, IV, VII</b>	One Dimensional Heat Conduction	Theoretical lectures Laboratory experiments	Lab. Work Experiment report
8	2	<b>I, III, IV, VII</b>	Transient Heat Transfer	Theoretical lectures Laboratory experiments	Lab. work Experiment report.
9	2	<b>I, III, IV, VII</b>	Force Convection from a Cylinder in a Cross Flow	Theoretical lectures Laboratory experiments	Lab. Work Experiment report
10	2	<b>I, III, IV, VII</b>	Centrifugal Pump Performance	Theoretical lectures Laboratory experiments	Lab. work Experiment report.
11	2	<b>I, III, IV, VII</b>	Verification of Bernoulli Equation	Theoretical lectures Laboratory experiments	Lab. Work Experiment report
12	2	<b>I, III, IV, VII</b>	Venturi Meter Apparatus	Theoretical lectures Laboratory experiments	Lab. work Experiment report.
13	2	<b>I, III, IV, VII</b>	Impact of a Jet	Theoretical lectures Laboratory experiments	Lab. Work Experiment report
14	2	<b>I, III, IV, VII</b>	Losses in Piping Systems	Theoretical lectures Laboratory experiments	Lab. work Experiment report.
15	2	<b>I</b>	Final Exam		Final exam

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Experiments in Hydraulics Book
Main references (sources)	Technical Documents for Laboratory Equipment
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
<b>Theory of Machines</b>	
2. Course Code:	
<b>MTE 306</b>	
3. Semester / Year:	
First Semester 2026-2025	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Tut (Tutorial), Lect(Online lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
78 hr/sem (SSWL: Structured Student Workload) / 6 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
1- Name: Dr. Hassan Al-Siraj E-mail: saeedh81@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<p><b>Course Learning outcomes (Objectives):</b></p> <p>1) Student is able to understand the theory of Turning Moment diagram of internal combustion engines and the versatility of the flywheel. [ I, II ]</p> <p>2) Student is able to understand the operation principles and design of the Frictional clutches. [ I, II ]</p> <p>3) Student is able to understand the operation principles and design of Belt drives. [ I, II ]</p> <p>4) Student is able to understand the various designs of toothed gears, their various classifications, related terminologies, and calculate them. student is able to understand the operation principle and design considerations (e.g. analyze the interference between two toothed gears). [I, II, VI, VII]</p> <p>5) Student is able to classify gear trains and their various use. Also, student is able to analyze and calculate related kinematics of gear trains. [ I, II ]</p> <p>6) understand the operation principles of various other machine parts like Gyroscope and Cams.[I, II, VI, VII]</p>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<p>1-Theoretical lectures</p> <p>2-Discussion sessions</p> <p>3-Projects</p>
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	I	Turning Moment Diagram and Flywheel – 1	Theoretical lectures	Quiz
2	5	II	Turning Moment Diagram and Flywheel – 2	Theoretical lectures	Assignment
3	5	I	Rotational Balancing	Theoretical lectures	Quiz
4	5	I	Balancing at different plans	Theoretical lectures	Mid Exam
5	5	I	Belt drives: Flat belt	Theoretical lectures	Mid Exam
6	5	I	Belt drives: V-type	Discussion sessions	Mid Exam
7	5	II	Frictional clutches	Theoretical lectures	Assignment
8	5	I	Mid Term Exam		
9	5	II, VI	Toothed gears: pressure angle, gear law, sliding velocity between two teeth, path of contact, arc of contact, contact ration for involute gears.	Theoretical lectures	Quiz
10	5	II, VI, VII	Toothed gears: Standard systems, interference between two involute gears.	Theoretical lectures	Project
11	5	I	Gear train: Definition, law of speed ratio, reverted gear train, compound gear train.	Theoretical lectures	Quiz
12	5	II, VI	Gear train: Epicyclic gear train system.	Theoretical lectures	Assignment
13	5	II, VII	Gyroscope	Discussion sessions	Activity
14	5	II, VI	Cams	Theoretical lectures	Assignment
15	5	I	Final Exam		

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>R.S. Khurmi and J. K. Gupta, "1. Theory of Machines," 14th ed.; S. Chand &amp; Co. Ltd., New Delhi, 2005.</li> </ul>
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Main references (sources)	<ul style="list-style-type: none"><li>• SS Rattan, "Theory of Machines," 4th ed, 2014.</li></ul>
Recommended books and references (scientific journals, reports...)	<a href="https://www.sciencedirect.com/journal/mechanism-and-machine-theory">https://www.sciencedirect.com/journal/mechanism-and-machine-theory</a>
Electronic References, Websites	<a href="http://www.digitallibrary.edu.pk/Index.php">http://www.digitallibrary.edu.pk/Index.php</a>

13.Course Name:					
<b>Heat transfer</b>					
14.Course Code:					
<b>MTE 307</b>					
15.Semester / Year:					
Second Semester 2026-2025					
16.Description Preparation Date:					
1/9/5025					
17.Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial)					
18.Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
19.Course administrator's name					
Name: Dr. Loay Bashir E-mail: loayaldabbagh@uomosul.edu.iq					
20. Course Objectives					
<b>Course Objectives</b>		1) Understand properties of real substances, such as steam and ideal gases [I, II] 2) Learn how to use tabular data and equations of state [I, II] 3) Understand and use the process diagrams. [I, II] 4) Understand closed systems and control volumes. [I, II, VI] 5) Understand the first law and its basic applications. [I, II] 1. 6) Understand the second law and its basic applications. [I, II, VI ]			
21. Teaching and Learning Strategies					
<b>Strategy</b>		1-Theoretical lectures 2-Discussion sessions 3-Laboratory experiments 4-Computer laboratories 5-Projects 6-Industrial training			
22. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I, II	Introduction to Thermodynamics		
2	4	I, II	Properties of Pure Substances		

3	4	I, II	The First Law of Thermodynamics for Closed Systems	Lecturer	Midterm exam
4	4		The First Law of Thermodynamics for Closed Systems		
5	4		The First Law of Thermodynamics for Closed Systems		
6	4	I, II	The First Law of Thermodynamics for Open Systems		
7	4	I, II, VI	The First Law of Thermodynamics for Open Systems		
8	4		Mid-Term Examination		
9	4		The Second Law of Thermodynamics		Quizzes
10	4	I, II	The Second Law of Thermodynamics		
11	4	I, II	Introduction to heat transfer		
12	4	I, II	Introduction to heat transfer		
13	4	I, II	One dimensional conduction		
14	4	I, II	One dimensional conduction		Final exam
15	4	I, II, VI	Final Examination		

23.

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

#### 24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Çengel, Y. A. and Boles, M. A., Thermodynamics: an Engineering Approach, 6th ed., The McGraw-Hill Companies, New York, © 2008.
Main references (sources)	Bergman, lavine, Incropera and dewitt - Fundamentals of Heat and Mass Transfer, John Wiley & Sons, Inc., 7th Edition 2011.

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
<b>Hydraulic and Pneumatic Systems</b>	
2. Course Code:	
<b>MTE308</b>	
3. Semester / Year:	
Second semester 2025/2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Tut (Tutorial)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
1- Name: Dr. Saad Ahmed Al Kazzaz E-mail: kazzazs60@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<p>Student who finish this course should:</p> <ol style="list-style-type: none"> <li>1) Recognize various types of fluid power circuits, their components, and the function of each component. <b>[I, II]</b></li> <li>2) Distinguish the preparation section components and the function of each component in a circuit. <b>[I, II, VI]</b></li> <li>3) Recognize various types of valves: directional, non-return, flow, pressure, and other combination control valves. Also identify the function of each of these valves in a circuit. <b>[I, II, , VI]</b></li> <li>4) Select the proper actuator for a fluid power circuit including special duty actuators. <b>[I, II, VI]</b></li> <li>5) Recognize various basic industrial and workshop fluid power circuits, and their special duty. <b>[II, VI]</b></li> <li>6) Read and symbolize various fluid power circuit and their components. <b>[II, IV]</b></li> </ol>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<ol style="list-style-type: none"> <li>1-Theoretical lectures</li> <li>2-Lab visiting</li> <li>3-Computer modeling software</li> <li>4-industrial learning videos</li> </ol>
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I, II	Introduction to fluid power systems, DCV designation	1 + 2 + 3	HW
2	4	I, II, VI	Working media fluid flow, DCV Classification	1 + 2 + 3	CW
3	4	I, II, VI	Working media power generation unit and components. DCV usage, selection, and performance	1 + 2 + 3	HW + CW
4	4	I, II, VI	Non-return Valves	1 + 2 + 3 + 4	HW + CW + Quiz
5	4	I, II, VI	flow control valves-1	1 + 2 + 3 + 4	CW
6	4	I, II, VI	flow control valves-2	1 + 2 + 3 + 4	HW + CW
7	4	I, II, VI	Mid term exam		
8	4	I, II, VI	pressure control valves-1	1 + 2 + 3 + 4	CW
9	4	I, II, VI	pressure control valves-2	1 + 2 + 3 + 4	HW + CW
10	4	I, II, VI	other types of valves	1 + 2 + 3 + 4	Quiz
11	4	I, II, VI	electric and PLC – control	1 + 2 + 3 + 4	HW
12	4	I, II, VI	Actuators - 1	1 + 2 + 3 + 4	HW
13	4	I, II, VI	Actuators - 2	1 + 2 + 3 + 4	HW + CW
14	4	I, II, VI	Actuators - 3	1 + 2 + 3	HW + CW + Quiz
15	4	II, IV	preliminary design considerations	1	HW

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Anthony Esposito, Fluid Power with Applications, 7th ed., 2014.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>Festo Didactics, various level textbooks, and workbooks</li> </ul>
Recommended books and references (scientific journals, reports...)	Festo Didactics, various level textbooks, and workbooks
Electronic References, Websites	LunchBoxSession.com/youtube sites

1. Course Name:					
<b>Computer Aided Machine Design 1</b>					
2. Course Code:					
<b>MTE309</b>					
3. Semester / Year:					
Second Semester 2026-2025					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name (mention all, if more than one name)					
Name: Ahmad Wadollah S. Al-Sabawi Email: ahmadalsabawi@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	<ul style="list-style-type: none"> <li>• Understand the design principles of machine elements (shafts, gears, bearings) and apply them using CAD tools.</li> <li>• Analyze stresses, material selection, and failure modes while creating accurate 2D/3D models.</li> <li>• Develop engineering drawings with proper standards, tolerances, and design calculations.</li> </ul> <p style="text-align: center;">Integrate mechanical design and CAD techniques for modeling, simulation, and prototyping in mechatronic systems.</p>				
9. Teaching and Learning Strategies					
Strategy	Class lectures and lab works				
10. Course Structure					
Week	Hou rs	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	The student identifies engineering materials used in mechanical design and their basic properties.	The Nature of Mechanical Design	Theoretical lecture + discussion	Discussion and participation
2	4	The student analyzes stresses and strains resulting from different types of loads.	Materials in Mechanical Design	Theoretical lecture + applied examples	Homework assignment
3	4	The student applies the principles of stress and strain analysis to	Stress and deformation Analysis 1	Theoretical lecture +	Quiz

		mechanical design problems.		problem solving	
4	4	The student understands combined stresses and uses Mohr's circle to analyze stress states.	Stress and deformation Analysis 2	Theoretical lecture + applied problem solving	Homework assignment + classwork assignment
5	4	The student distinguishes different types of loads and applies the appropriate design principles for them.	Combined Stresses and Mohr's Circle	Theoretical lecture + applied exercises	Homework assignment + problem solving
6	4	The student designs mechanical elements under different types of loads.	Design of Different Types of Loadings 1	Theoretical lecture + design problems	Homework assignment + report
7	4	The student identifies shafts, their functions, and the types of loads acting on them.	Design of Different Types of Loadings 2	Theoretical lecture + problem solving	Quiz
8	4	The student evaluates understanding of previous topics through theoretical and practical examinations.	Columns	Theoretical lecture + applied examples	Homework assignment + discussion
9	4	The student applies shaft design steps according to stress and strength requirements.	Midterm Exam	Exam + laboratory discussion	Midterm exam
10	4	The student analyzes shaft design cases and selects suitable dimensions according to operating conditions.	Shaft Design 1	Theoretical lecture + design problem solving	Homework assignment + classwork assignment
11	4	The student identifies belt drives and calculates their basic design requirements.	Shaft Design 2	Theoretical lecture + applied exercises	Homework assignment + design problem solving
12	4	The student identifies chains, their applications, and performs the related design calculations.	Belt Drives	Theoretical lecture + applied problems	Report + homework assignment
13	4	The student distinguishes types of keys and couplings and applies their design principles in transmitting motion and torque.	Chain Drives	Theoretical lecture + applied examples	Report + homework assignment
14	4	The student reviews the main concepts of the course and	Keys and Couplings	Theoretical lecture + design	Homework assignment + discussion

		prepares for the final assessment.		problem solving	
15		The student identifies engineering materials used in mechanical design and their basic properties.	Final Exam	General review + final exam	Final exam

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Machine Elements in Mechanical Design – Robert L. Mott, 6th Edition, 2018
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Shigley's Mechanical Engineering Design – Budynas & Nisbett, 11th Edition, 2021
Electronic References, Websites	<a href="https://ocw.mit.edu/courses/2-72-elements-of-mechanical-design-spring-2009/">https://ocw.mit.edu/courses/2-72-elements-of-mechanical-design-spring-2009/</a>

1. Course Name:	
<b>Microcontroller Systems Design</b>	
2. Course Code:	
<b>MTE 310</b>	
3. Semester / Year:	
Second Semester 2026-2025	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Lab (Laboratory)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).	
7. Course administrator's name	
Name: Dr. Mohammed Yaseen E-mail: mohammed.alnuaimi@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• Introduce the core concepts of microcontrollers, their architectures, and the differences between microprocessors and microcontrollers.</li> <li>• Develop an in-depth understanding of PIC microcontrollers, with emphasis on the PIC16F84A internal architecture, memory organisation, and major features.</li> <li>• Equip students with the skills required to write, understand, and debug Assembly language programmes for PIC microcontrollers.</li> <li>• Provide hands-on laboratory experience in programming and interfacing the PIC16F84A microcontroller with simple input/output devices.</li> <li>• Demonstrate the role of microcontrollers in mechatronics applications that integrate mechanical, electrical, and computer-based systems.</li> <li>• Strengthen students' problem-solving, project implementation, teamwork, and independent learning skills in microcontroller system design.</li> </ul>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<p>Lectures to explain theoretical principles, terminology, architecture, memory organisation, and instruction-set concepts.</p> <ul style="list-style-type: none"> <li>• Interactive discussions and real-world examples to connect microcontroller theory with mechatronics applications.</li> <li>• Laboratory sessions using PIC16F84A programming, simulation, debugging, and basic hardware interfacing tasks.</li> </ul>

	<ul style="list-style-type: none"> <li>• Individual and group mini-projects to apply Assembly programming and microcontroller interfacing concepts.</li> <li>• Demonstrations of development tools, circuit operation, programme execution, and troubleshooting procedures.</li> <li>• Assignments, quizzes, reports, and continuous feedback to reinforce learning and identify areas needing improvement.</li> </ul>
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### 10. Course Structure

Week	Hou rs	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understand the purpose and structure of microcontroller systems and distinguish them from microprocessor systems.	Introduction to microcontrollers; difference between microprocessor and microcontroller; Lab: development environment and basic input/output.	Lecture + laboratory demonstration	Class participation / lab checklist
2	4	Compare Reduced Instruction Set Computer (RISC) and Complex Instruction Set Computer (CISC) architectures.	RISC and CISC architectures; Harvard and Von Neumann architecture concepts; Lab: PIC16F84A architecture and memory overview.	Lecture + discussion + lab	Short quiz / lab notes
3	4	Describe the internal architecture of PIC microcontrollers and identify the main functional blocks.	Internal architecture of PIC microcontrollers; Central Processing Unit (CPU), memory, input/output ports, timers, and Special Function Registers (SFRs); Lab: assembly programming and control structures.	Lecture + guided lab	Laboratory task
4	4	Explain microcontroller memory organisation and relate memory areas to programme execution.	Memory organisation of microcontrollers; programme memory, data memory, Read-Only Memory (ROM), Random	Lecture + laboratory exercise	Assignment / lab observation

			Access Memory (RAM), and Electrically Erasable Programmable Read-Only Memory (EEPROM); Lab: timers and interrupts.		
5	4	Analyse the data memory structure of PIC microcontrollers and use registers appropriately.	Data memory of PIC microcontrollers; General Purpose Registers (GPRs) and Special Function Registers (SFRs); Lab: serial communication concepts.	Lecture + coding lab	Quiz 1
6	4	Explain programme memory, programme counter operation, and the concept of interrupts.	Programme memory of PIC microcontrollers; programme counter; introduction to interrupts; Lab: analogue interfacing and analogue-to-digital conversion concepts.	Lecture + practical lab	Laboratory task
7	4	Demonstrate understanding of early course concepts and identify Assembly statement structure.	Midterm exam + PIC microcontroller Assembly statement, directives, addressing modes, and instruction-set overview; Lab: mini-project planning.	Midterm exam + lecture + lab	Midterm exam
8	4	Use bit-oriented instructions to manipulate individual bits in registers and ports.	PIC microcontroller bit-oriented instructions; practical examples for input/output control.	Lecture + coding laboratory	Lab exercise
9	4	Use byte-oriented instructions to process byte-level data and register operations.	PIC microcontroller byte-oriented instructions;	Lecture + coding laboratory	Assignment

			register operations and programme examples.		
10	4	Implement arithmetic and logic instructions in Assembly programmes.	PIC microcontroller arithmetic and logic instructions; calculations, logic operations, flags, and examples.	Lecture + coding laboratory	Quiz 2
11	4	Apply control instructions to build conditional and unconditional programme flow.	PIC microcontroller control instructions; branching, subroutines, and programme flow control.	Lecture + laboratory practice	Laboratory task
12	4	Apply shift and rotate instructions in practical Assembly programming tasks.	PIC microcontroller shift and rotate instructions; bit movement and data manipulation examples.	Lecture + coding laboratory	Assignment
13	4	Use loop instructions and prepare technical documentation for practical work.	PIC microcontroller loop instructions; repetitive programme structures; project/report development.	Lecture + project laboratory	Report
14	4	Design and test a simple microcontroller-based interfacing/application task.	Microcontroller interfacing and applications; sensors, actuators, input/output devices, debugging, and project development.	Project-based laboratory	Project progress assessment
15	4	Present and discuss a microcontroller-based design and evaluate its functionality.	Student project discussion; system demonstration, testing, troubleshooting, and improvement.	Project presentation + laboratory discussion	Project / lab assessment
16	4	Review the complete course content and prepare for the final examination.	Preparatory week before the final exam; integrated review of theory, programming, architecture, and laboratory work.	Revision lecture + discussion	Final exam preparation

## 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Martin P. Bates, Introduction to Microelectronic Systems: The PIC 16F84 Microcontroller, Butterworth-Heinemann, 2011.
Main references (sources)	Microchip Technology Inc., PIC16F84A Data Sheet.
Recommended books and references (scientific journals, reports...)	Martin P. Bates, PIC Microcontrollers: An Introduction to Microelectronics, 3rd ed., Elsevier/Newnes, 2011.
Electronic References, Websites	Microchip MPLAB® X Integrated Development Environment (IDE) documentation and user guides.

1. Course Name:					
<b>Numerical Methods</b>					
2. Course Code:					
<b>MTE 311</b>					
3. Semester / Year:					
Second Semester 2026-2025					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
7.					
Name: Dr. Hasanien Ali Talib Alothman Email: hasanien.ali@uomosul.edu.iq					
8. Course Objectives					
<b>Course Objectives</b>		1-Derive numerical methods for various mathematical operations and tasks, such as curve fitting n, differentiation, and integration. [I, VI]. 2-The solution of linear and nonlinear equations [I]. 3- The solution of differential equations [I, VI ]. 4-Analyze and evaluate the accuracy of common numerical methods [I].			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Theoretical lectures 2-Discussion sessions 3-Projects			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I, VI	Concepts and role for the numerical method in engineering, approximations and errors, the definition of Round-off error and truncation error, absolute and relative true/approximation error.	Theoretical lectures Discussion sessions	Assignment Activity

2	4	I, VI	Numerical solution of Nonlinear algebraic equations (Root of equations): Bracketing methods (Bisection, and False-position method).	Theoretical lecture Assignment	Quizzes
3	4	I, VI	Open methods (Newton-Raphson and secant method).	Theoretical lecture Discussion session	Assignment
4	4	I, VI	Numerical solution of linear algebraic equations (system): The difference between the direct and indirect methods, singular and ill/well-conditioned system, partial and complete pivoting, convergence criteria, Jacobi iteration method.	Theoretical lecture Discussion session	Activity Quizzes
5	4	I, VI	The gauss-Seidel iterative method, Gauss-Seidel iterative with the relaxation factor method, Tri-diagonal system and its solution.	Theoretical lecture Assignment	Assignment
6	4	I, VI	Curve Fitting: Classification of Curve Fitting (Regression and Interpolation), the concepts of regression, and Least Square Criterion, Linear Regression.	Theoretical lecture Discussion session	Assignment
7	4	I, VI	Nonlinear Regression, popular nonlinear regression models (Exponential, Power, Growth, and Polynomial model), the linearization of the first three nonlinear models, Polynomial regression.	Theoretical lecture Discussion session	Activity Quizzes
8	4	I, VI	Introduction to Interpolation: Cubic Spline Interpolation (Cheney and Kincaid Formula)	Theoretical lecture Discussion session	Assignment

9	4	I, VI	Numerical Integration: Trapezoidal Rule (equal and non-equal segment width), Simpson's 1/3 rule (equal and non-equal segment width).	Theoretical lecture Assignment	Assignment Activity
10	4	I, VI	Numerical Differentiation: Taylor series and truncation error, the approximation of the first derivative (FDA, BDA and CDA), the approximation of the second derivative (FDA, BDA and CDA).	Theoretical lecture Discussion session	Assignment
11	4	I, VI	Numerical Solution of Ordinary Differential Equation (ODE): Classification of Differential Equation (Initial Value Problem "IVP" and Boundary Value Problem "BVP"), the numerical methods for solving the IVP (Euler's)	Theoretical lecture	Assignment
12	4	I, VI	Fourth-Order Runge-Kutta method for solving the IVP, Numerical solution for the system of ODEs with the two methods above.	Theoretical lecture Discussion session	Assignment
13	4	I, VI	The numerical methods for solving the BVP: The shooting method adaptation together with the two above methods used to solve the IVP.	Theoretical lecture Assignment	Assignment
14	4	I, VI	Introduction to another methods (finite difference, finite volume, finite element method)	Theoretical lecture	Assignment Activity
15	4	I, VI	Final Exam.		Final exam

11. Course Evaluation

<b>Assessment Type</b>	<b>Number / Duration</b>	<b>Marks</b>
<b>Quizzes</b>	<b>3</b>	<b>6%</b>
<b>Assignments</b>	<b>3</b>	<b>6%</b>
<b>Project / Lab</b>	<b>8</b>	<b>8%</b>
<b>Report</b>	<b>1</b>	<b>3%</b>
<b>Midterm lab</b>	<b>1</b>	<b>7%</b>
<b>Midterm Exam</b>	<b>1</b>	<b>20%</b>
<b>Final Exam</b>	<b>1</b>	<b>50%</b>
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>• Steven C. Chapra and Raymond P. Canale, Numerical Methods for Engineering: with Software and Programming Application, Fourth edition, 2003.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>• Steven T. Karris, Numerical Analysis Using Matlab and Excel, Third Edition, 2007</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Power electronics and drive</b>					
2. Course Code:					
<b>MTE 312</b>					
3. Semester / Year:					
Second Semester 2026-2025					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial), Lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
63 hr/sem (SSWL: Structured Student Workload) / 5 ECTS (European Credit Transfer and Accumulation System).					
7. Course administrator's name					
1- Name: Dr. Myasar salim altar					
E-mail: <a href="mailto:myasalarattar@uomosul.edu.iq">myasalarattar@uomosul.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		The objective of this course is to:			
		<b>5. Ability to solve engineering problems.</b> <b>6. Ability to produce engineering designs.</b> <b>7. Ability to create and carry out measurements and tests.</b> <b>8. Ability to work on teams and manage projects.</b>			
9. Teaching and Learning Strategies					
<b>Strategy</b>		5- Theoretical lectures 6- home work 7- Assignments 8- computer lab			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I	introduction to equations needed in power electronics circuit and wave analysis	Theoretical lectures	
2	4	I,II	solved problem for ac and dc circuit analysis	Theoretical lectures	

3	4	I,II	power electronics switches diodes type operation principles and characteristics	Theoretical lectures	
4	4	I,II	power electronics switches thyristors type operation principles and characteristics	Theoretical lectures	
5	4	I, II, III	solved problem	Theoretical lectures	quiz
6	4	I,II	single phase controlled and uncontrolled rectifiers half wave	Theoretical lectures	
7	4	I, II, ,III,VII	single phase bridge uncontrolled rectifiers full wave	Theoretical lectures	
8	4	I,II,III	single phase bridge semiconrolled and controlled rectifiers full wave	Theoretical lectures	
9	4	I,II	mid term exam	Theoretical lectures	mid term exam
10	4	I, II, ,III,VII	single phase ac to ac half wave controlled circuit	Theoretical lectures	
11	4	I, II, III	dc-dc converter	Theoretical lectures	
12	4	I,II	buck and boost converter	Theoretical lectures	
13	4	I,II	dc-ac converter (inverter)	Theoretical lectures	quiz
14	4	I,II	dc-ac converter (inverter) resonance type	Theoretical lectures	
15	4	I, II, III			<b>Final Exam</b>

### 11. Course Evaluation

Assessment Type	Number / Duration	Marks
Quizzes	3	6%
Assignments	3	6%
Project / Lab	8	8%
Report	1	3%
Midterm lab	1	7%
Midterm Exam	1	20%
Final Exam	1	50%
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Electrical Machines by S. K. Sahdev 2018</li> </ul>
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	<ul style="list-style-type: none"> <li>• PRINCIPLES OF ELECTRIC MACHINES AND POWER ELECTRONICS , THIRD EDITION .by P. C. SEN 2013</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>• POWER ELECTRONICS HANDBOOK DEVICES, CIRCUITS, AND APPLICATIONS ,Third Edition by MUHAMMAD H. RASHID 2001</li> </ul>
Recommended books and references (scientific journals, reports...)	<ul style="list-style-type: none"> <li>• ELECTRICAL MACHINES with MATLAB® ,Second Edition by TURAN GÖNEN ,2012</li> </ul>
Electronic References, Websites	

**Study Courses of the Department of Mechatronics Engineering /  
College of Engineering / University of Mosul**

**Fourth Level / Semester System Track**

**First Semester**

Course Code	Subject	اسم المادة	Weekly Hours			Number of Units
			Theoretical	Tutorial	Laboratory	
MTE 401	Communication and Networking Engineering	هندسة الاتصالات والشبكات	2	0	0	2
MTE 402	Digital Control Systems	نظم سيطرة رقمية	2	1	2	3
MTE 403	Artificial intelligent	ذكاء اصطناعي	2	1	0	2
MTE 404	Image Processing	معالجة الصور	2	0	0	2
MTE 405	Industrial Automation I	I أتمتة صناعية	2	0	2	3
MTE 406	Design of Mechatronics System	تصميم أنظمة الميكاترونكس	2	0	2	3
MTE 407	Robotics I	II الروبوتات	2	0	2	2
MTE 408	Project I	I مشروع	1	0	2	2
<b>Total</b>			<b>15</b>	<b>2</b>	<b>8</b>	<b>19</b>
<b>Total Weekly Hours</b>			<b>25</b>			

**الفصل الدراسي الثاني**

Course Code	Subject	اسم المادة	Weekly Hours			Number of Units
			Theoretical	Tutorial	Laboratory	
MTE 409	Intelligent Control	سيطرة ذكية	2	1	0	2
MTE 410	Engineering Management	إدارة هندسية	2	0	0	2
MTE 411	Special Topics in Mechatronics	موضوعات خاصة في الميكاترونكس	2	1	0	2
MTE 412	Industrial Automation II	II الأتمتة الصناعية	2	0	2	3
MTE 413	Robotics II	II الروبوتات	2	0	2	3
MTE 414	Project II	II مشروع	1	0	2	2
MTE 415	Computer Interfacing	ربط بيني	2	0	2	3
MTE 416	Statistic II	II الإحصاء	2	0	0	2
<b>Total</b>			<b>15</b>	<b>2</b>	<b>8</b>	<b>19</b>
<b>Total Weekly Hours</b>			<b>25</b>			

## Course Description / Fourth level

1. Course Name:					
<b>Communications and Networking Engineering</b>					
2. Course Code:					
<b>MTE 401</b>					
3. Semester / Year:					
First Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 / 2					
7. Course administrator's name					
Name: Dr. Muhamad Azhar Abdilatef E-mail: Muhamad.azhar@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	1) Adequate knowledge in Communication system concepts,. (I, II). 2) Ability to design and implement networks under realistic constraints and conditions, (I, II, V). 3) Ability to understand the details of digital and analog signals, (II, IV, V). 4) Ability to devise, select, and use modern techniques and tools needed for communication system,.( VI).				
9. Teaching and Learning Strategies					
Strategy	1-Theoretical lectures 2-Discussion sessions 3-Projects				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	<b>I</b>	Communication Systems	Theoretical lectures	HW
2	2	<b>I, V</b>	Signals and Its Categories	Theoretical lectures	EXAM
3	2	<b>I, V</b>	Analog Communications	Theoretical lectures	

					HW
4	2	<b>II, V, VII</b>	Analog modulation: Amplitude modulation frequency modulation, phase modulation	Theoretical lectures	EXAM
5	2	<b>II, V, VII</b>	Digital Signaling and Circuits	Theoretical lectures/ Discussion sessions	CW
6	2	<b>I, II, V, VII</b>	Analog to digital conversion, quantizing, encoding.	Theoretical lectures	Exam
7	2	<b>II, V, VII</b>	Digital Modulation	Theoretical lectures/ Discussion sessions	HW
8	2	<b>I, II, V, VII</b>	Fiber Optics	Theoretical lectures/ Discussion sessions	CW
9	2	<b>I, V, VII</b>	Principles of Networking, Networks Categories	Theoretical lectures/ Discussion sessions	HW
10	2	<b>I, VII</b>	Protocols, Standards, Standards Organizations, Internet Standards	Theoretical lectures	EXAM
11	2	<b>I, VII</b>	Network Models	Theoretical lectures	HW
12	2	<b>I, V, VII</b>	Network Layers	Theoretical lectures	CW
13	2	<b>I, II, VII</b>	Ethernet	Theoretical lectures	EXAM

14	2	I, II	Wireless Networks	Theoretical lectures	HW
15	2	I, VII	Applications of Networking and Communication in Mechatronics	Theoretical lectures	CW

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Behrouz A. Forouzan: Data Communication and Networking, 4<sup>th</sup> edition</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>B. Sklar, Digital Communications: Fundamentals and Applications, 2nd Ed., Prentice Hall, 2001.</li> <li>L. W. COUCH II, Digital and Analog Communication Systems, 6th Edition, Prentice Hall.</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

25.Course Name:					
<b>Digital Control Systems</b>					
26.Course Code:					
<b>MTE 402</b>					
27.Semester / Year:					
First Semester / 2025-2026					
28.Description Preparation Date:					
1/9/2025					
29.Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial), Lab (Laboratory)					
30.Number of Credit Hours (Total) / Number of Units (Total)					
5 / 3					
31.Course administrator's name					
1- Name: Dr. Firas Ahmed Al-Durze E-mail: <a href="mailto:dr.firasaldurze@uomosul.edu.iq">dr.firasaldurze@uomosul.edu.iq</a>					
32.Course Objectives					
Course Objectives		Understanding the various issues related to digital control systems such as <ol style="list-style-type: none"> <li>1. Students understand the basic sampling theory and converter [ I ]</li> <li>2. Students understand Z-transform and its properties [ I ]</li> <li>3. Students can analyze signals in both time domain and Z domain [ I II ]</li> <li>4. Students understand transfer function, block diagram, and signal flow graphs [ I ]</li> <li>5. Students understand the state variable technique [ I ]</li> <li>6. Students understand the basic knowledge necessary for system stability [ I VI ]</li> <li>7. Students learn the theory of digital PID controller [ I II III VI ]</li> <li>8. Students can design the discrete-date control systems [I II III VI]</li> </ol>			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Theoretical lectures 2-Discussion sessions 3-Laboratory experiments			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	<b>I</b>	Introduction to digital control.	Theoretical lectures	<b>HW</b>

2	5	I	Discrete time system representation.	Theoretical lectures	HW
3	5	I	Mathematical modeling of sampling process.	Theoretical lectures	HW
4	5	I	Data reconstruction.	Theoretical lectures	HW
5	5	III	Modeling discrete-time systems by pulse transfer function.	Theoretical lectures	HW
6	5	I	Revisiting Z-transform.	Theoretical lectures	Exam
7	5	III	Mapping of s-plane to z-plane.	Discussion sessions	CW
8	5	I	Pulse transfer function I.	Theoretical lectures	HW
9	5	I	Pulse transfer function II.	Theoretical lectures	Exam
10	5	III	Sampled signal flow graph.	Theoretical lectures	HW
11	5	I III	Stability analysis of discrete time systems.	Theoretical lectures	HW
12	5	I III	Jury stability test. Stability analysis using bi-linear transformation	Discussion sessions	CW
13	5	I III	Time response of discrete systems.	Theoretical lectures	HW
14	5	I II III VI	Transient and steady state responses	Theoretical lectures	Exam
15	5	I II III VI	Root locus method for discrete system.	Discussion sessions	CW

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)

<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Digital Control Engineering Analysis and Design, M. Sami Fadali, Second Edition.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>In the library, there are many control systems books that can be used as reference books.</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
<b>Artificial Intelligent</b>	
2. Course Code:	
<b>MTE 403</b>	
3. Semester / Year:	
First Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Tut (Tutorial)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 / 2	
7. Course administrator's name (mention all, if more than one name)	
1- Name: Dr. Aws Anaz E-mail: <a href="mailto:aws.anaz@uomosul.edu.iq">aws.anaz@uomosul.edu.iq</a>	
8. Course Objectives	
Course Objectives	<p>Course Learning Outcomes:</p> <ol style="list-style-type: none"> <li><b>Demonstrate Proficiency in Problem-Solving with Artificial intelligence (Linked to GO I):</b> Apply acquired knowledge from topics such as artificial neural networks, Radial Bases Networks, and evolutionary algorithms to identify, evaluate, and solve complex engineering problems in intelligent systems. This competency will be assessed through the Midterm Exam, Quizzes, and Final Exam.</li> <li><b>Excel in Integrated System Design with a Focus on Intelligent Systems Applications (Linked to GO II):</b> Design integrated systems and their components, emphasizing applications in intelligent decision-making. Demonstrate the ability to fulfill common needs through the design of systems related to artificial neural networks, Radial Base Networks, and evolutionary algorithms. This skill will be assessed through the Mini Project, Assignment, and Activity.</li> <li><b>Perceive ethical and professional responsibilities in Emerging Artificial intelligence (Linked to GO V):</b> Demonstrate the ability to acquire moral and professional responsibilities in engineering cases and make brilliant judgments considering the consequences of using Artificial intelligence in Mechatronics applications. This skill will be assessed through the Mini Project.</li> <li><b>Excel in Collaborative Problem-Solving within the Realm of Artificial Intelligence (Linked to GO VII):</b> Function effectively on multidisciplinary teams to analyze problems, devise solutions, and meet deadlines within intelligent control systems. Apply collaborative problem-solving skills to topics such as artificial neural networks, Radial Base Networks, and evolutionary</li> </ol>

	algorithms. This competency will be assessed through the Mini Project and Activity.				
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>	1-Theoretical lectures 2-Discussion sessions 3-Projects 4-Assignments				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	<b>II</b>	Introduction to Intelligence.	Theoretical lectures	<b>HW</b>
2	3	<b>II</b>	Introduction to Artificial Neural Networks, Neuron Model.	Theoretical lectures	<b>HW</b>
3	3	<b>II</b>	Neuron Model	Theoretical lectures	<b>HW</b>
4	3	<b>VII</b>	Single Neuron Model: examples	Discussion sessions	<b>CW</b>
5	3	<b>VII</b>	Artificial neural networks: applications.	Discussion sessions	<b>CW</b>
6	3	<b>I</b>	Feedforward Neural Networks,	Theoretical lectures	<b>Exam</b>
7	3	<b>I</b>	Derivation of Error Backpropagation (EBP) Training Algorithm.	Theoretical lectures	<b>Exam</b>
8	3	<b>II</b>	Improving the Convergence Properties of EBP, Second Order Training Schemes.	Discussion sessions	<b>HW</b>
9	3	<b>I, II, VII, V</b>	Artificial neural networks: applications.	<b>Project</b>	<b>Project evaluation</b>
10	3	<b>I</b>	Radial Basis Function Neural Networks, Unsupervised Learning	Theoretical lectures	<b>Exam</b>

11	3	I	Midterm exam		<b>Exam</b>
12	3	I	Introduction to Genetic Computing, Encoding and Decoding, Operators: Mutation, Crossover, Offspring generation.	Theoretical lectures	<b>Exam</b>
13	3	I	Particle Swarm Optimization	Theoretical lectures	<b>Exam</b>
14	3	I, II, VII, V	AI applications in Mechatronics	Project	<b>Project evaluation</b>
15	3	I, II, VII, V	Final exam+ final project presentation	Project	<b>Project evaluation</b>

### 11. Course Evaluation

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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>The course will rely primarily on handouts and papers.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>“Fundamentals of Computational Intelligence: Neural Networks, Fuzzy Systems, and Evolutionary Computation” (IEEE Press Series on Computational Intelligence) 1st Edition by James Keller, Derong Liu, and David Fogel.</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Image processing</b>					
2. Course Code:					
<b>MTE 404</b>					
3. Semester / Year:					
First Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 / 2					
7. Course administrator's name					
Name: Dr. Zahraa Tarik Al Ali E-mail: Zahraata.eng@uomosul.edu.iq					
8. Course Objectives					
Course Objectives		<p>student who finish this course should:</p> <p>1) the important rule of studying the image processing and its application in the robotic system.( I )</p> <p>2)Knowing different type of image filtering of spaicial and frequency filters. (III)</p> <p>3) The student learned what image segmentation and image classifiacation. (VI)</p> <p>4) the student learned the image compression. (VII )</p>			
9. Teaching and Learning Strategies					
Strategy		<p>1-Theoretical lectures</p> <p>2-Discussion sessions</p> <p>3-Projects</p>			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The student understands the lesson	Introduction to digital image processing	Theoretical	Class participation and quiz

2	2	The student understands the lesson	Digital imaging fundamentals 1	Theoretical	Class participation and quiz
3	2	The student understands the lesson	Digital imaging fundamentals 2	Theoretical	Class participation and quiz
4	2	The student understands the lesson	Image enhancement 1	Theoretical	Class participation and quiz
5	2	The student understands the lesson	Image enhancement 2	Theoretical	Class participation and quiz
6	2	The student understands the lesson	Image enhancement Histogram processing	Theoretical	Class participation and quiz
7	2	The student understands the lesson	Image enhancement spatial filters 1	Theoretical	Class participation and quiz
8	2	The student understands the lesson	Image enhancement spatial filter 2	Theoretical	Class participation and quiz
9	2	The student understands the lesson	Image enhancement frequency filter 1	Theoretical	Class participation and quiz
10	2	The student understands the lesson	Image enhancement frequency filter 2	Theoretical	Class participation and quiz
11	2	The student understands the lesson	Image segmentation	Theoretical	Class participation and quiz
12	2	The student understands the lesson	Image segmentation	Theoretical	Class participation and quiz
13	2	The student understands the lesson	IMAGE compression 1	Theoretical	Class participation and quiz
14	2	The student understands the lesson	IMAGE compression 2	Theoretical	Class participation and quiz
15	2		review		

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)

<b>Project / Lab</b>	1	10% (10 Marks)
<b>Report</b>	1	10% (10 Marks)
<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Rafael c Conzales &amp; Richard E wood, digital image processing, 4th ed., 2010.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>various level textbooks, and workbooks</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Industrial automation I</b>					
2. Course Code:					
<b>MTE 405</b>					
3. Semester / Year:					
First Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4 / 3					
7. Course administrator's name					
1- Name: Dr. Ali A. Abdulla Alkurukchi E-mail: <a href="mailto:ali.alkurukchi@uomosul.edu.iq">ali.alkurukchi@uomosul.edu.iq</a>					
8. Course Objectives					
Course Objectives		The objective of this course is to:			
		<p><b>1- Link to GO I</b> Have deep understanding of Automation systems and its types. This objective will achieve through the Quizzes, Midterm exam and Final exam.</p> <p><b>2- Link to GO II &amp; III</b> Gain an ability to develop a PLC program using various Programming methods. This objective will achieve the GOII &amp; III through the Assignment, and Activity.</p> <p><b>3- Link to GO III</b> Design a complete Mechatronic System.</p>			
9. Teaching and Learning Strategies					
Strategy		<p>1-Theoretical lectures</p> <p>2-Discussion sessions</p> <p>3-Laboratory experiments</p> <p>4-Assignment</p> <p>5-Exam</p> <p>6- Projects</p>			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	4	I	Introduction, the major advantages of using automation, Automation Lab. Example, Industrial Automation vs. Industrial Information Technology,	Theoretical Lectures	
2	4	II,III	Role of automation in industry, Automation Advantages, Industrial Product Life Cycle, Economy of Scale and Economy of Scope, Production Systems Types, Types of Automation Systems	Theoretical Lectures	<b>Homework</b>
3	4	I	Architecture of Industrial Automation Systems, The Functional Elements of Industrial Automation, Sensing and Actuation Elements.	Theoretical Lectures	
4	4	II,III	Industrial Sensors and Instrument Systems. Industrial Actuator Systems, Industrial Control Systems, The Architecture of Elements: The Automation Pyramid	Theoretical Lectures	<b>Discussion</b>
5	4	II,III	Introduction to Sequence/Logic Control and Programmable Logic Controllers, Industrial Example of Discrete Sensors and Actuators,	Theoretical Lectures	<b>Homework</b>

			Programmable Logic Controllers (PLC),		
6	4	I	Comparing Logic and Sequence Control with Analog Control, PLC Evolution , PLC >> Application Areas, PLCs Architecture, Communications processors, Expansion units, Input/output Units, Programmers	Theoretical Lectures	Quiz
7	4	I,III	Mid-Term Exam	Theoretical Lectures	Mid_Term Exam
8	4	I	The Software Environment and Programming of PLCs, Structure of a PLC Program, The cyclic execution of PLC Programs,	Theoretical Lectures	
9	4	I	The Relay Ladder Logic (RLL) Diagram, Example: Forward Reverse Control	Theoretical Lectures	
10	4	I	The Function Chart (IEC), The Statement List (STL), Typical Operands of PLC Programs, Internal Variable Operands or Flags,	Theoretical Lectures	Quiz
11	4	II,III	Timers(On delay, Off delay, Fixed pulse width timer, Retentive Timer, Non-Retentive Timer), Counter, User defined Data, Addressing, Operation Set.	Theoretical Lectures	Discussion

12	4	I	Formal Modelling of Sequence Control Specifications and Structured RLL Programming, motivation example Industrial stamping process,	Theoretical Lectures	
13	4	I	Steps in Sequence Control Design, Design of RLL Program, state transition logic, state logic, output logic,	Theoretical Lectures	
14	4	I	Introduction to Computer Numerically Controlled (CNC) Machines	Theoretical Lectures	
15	4	II,III	G-Codes Principals	Theoretical Lectures	<b>Discussion</b>

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>M. Groover, “Automation, Production Systems, and Computer Integrated Manufacturing” 3rd edition.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>In the library, there are many Automations books that can be used as reference books</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Design of Mechatronics System</b>					
2. Course Code:					
<b>MTE 406</b>					
3. Semester / Year:					
First Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4 / 3					
7. Course administrator's name					
1- Name: Dr. Saad Ahmed Salih Al Kazzaz E-mail: kazzazs60@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	The students after successfully complete the course are able to: 1-Learn how to work with different components of mechatronics systems. (I,II,III,VI) 2-Discuss the concepts modeling as parts of control system field. (I,II,III) 3-Design and Model Parts or Whole Mechatronic System (I,II,III,VI)				
9. Teaching and Learning Strategies					
Strategy	1-Theoretical lectures 2-Laboratory experiments 3-Project 4-Projects				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	I	Mechatronics Design Process	lecture	
2	2	I	Transfer Functions, Block Diagrams and Manipulations	lecture	homework

3	2	I	Modeling and Simulation	lecture	
4	2	I	Block Diagram Modeling—Direct Method	lecture	Quiz
5	2	I	Block Diagram Modeling—Analogy and Modified Analogy Approachs	lecture	
6	2	I	Block Diagram Modeling of Electrical and Mechanical Systems	lecture	homework
7	2	I	Block Diagram Modeling Electromechanical system	lecture	Quiz
8	2	I, II	Sensors and transducers Modeling	lecture	
9	1	I	Midterm Exam		Exam
10	2	I	Modeling of Actuating systems	lecture	
11	2	I	Control system Modeling	lecture	homework
12	2	I, II, VI	Study Case I	lecture	
13	2	I, II, VI	Study Case II	lecture	Quiz
14	2	I, II, VI	Projects Discussion		
15	3	I	Final Exam		Exam

**Laboratory**

Weeks	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Lecture	Review of Modeling softwares	I	
2	2	Lab Experiment	Inroduction to MATLAB Simulink	III	Report
3	2	Lab Experiment	Modeling and Simulation using MATLAB	III	Report

4	2	Lab Experiment	Modeling and simulation Electrical Systems	III	Report
5	2	Lab Experiment	Modeling and simulation of Mechanical Systems	III	Report
6	2	Lab Experiment	Mathematical Modeling of a DC motor in Simulink	III	Report
7	2	Lab Experiment	Physical Modeling of a DC motor in Simulink Using Simscape	III	Report
8	2	Lab Experiment	Modeling of a Mechanism Using Simscape Multibody	III	Report
9	2	Exam	Midterm Exam	I	Report
10	2	Lab Experiment	Modeling and Analyzing of a Simple Pendulum Using Simscape Multibody	III	Report
11	2	Lab Experiment	Import CAD Model into Simscape Multibody	III	Report
12	2	Lab Experiment	Gathering sensor data using data acquisition card in different modes	III	Report
13	2	Lab Experiment	Discussion of Mini Projects	III	Report
14	2	Lab Experiment	Free lab for students' practices and report discussion	III	Report
15			Final Lab Exam		Exam

### 11. Course Evaluation

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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>• “Mechatronics System Design”, Second Edition, SI by Devdas Shetty and Richard A. Kolk, 2010.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>• “Mechatronic Systems Design Methods, Models, Concepts”, First eddition By Klaus Janschek,2012</li> <li>• “Control of Mechatronic Systems: Model-Driven Design and Implementation Guidelines”, First edition, by Patrick O. J. Kaltjob, 2020</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Robotics I</b>					
2. Course Code:					
<b>MTE 407</b>					
3. Semester / Year:					
First Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4 / 2					
7. Course administrator's name					
1- Name: Dr. Omar W. Maarooof E-mail: omarmaarooof@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	1)Student is able to understand the transformation of position, velocity and acceleration. [I, II, VII] 2)Student is able to calculate the forewords and inverse kinematics. [I, II, III, VI] 3)Student is able to understand the velocity propagation from link to another towards the tip. [I, II, III] 4)Student is able to obtain the dynamic equations of any robot arm. [I, II, III] 5)Understand the generation of trajectory for robot arm.[I, II, VI] 6)Student is able to design a controller for trajectory tracking. [I, II, III]				
9. Teaching and Learning Strategies					
Strategy	1-Theoretical lectures 2-Discussion sessions 3-Laboratory experiments 4-Projects				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	<b>I</b>	Introduction to robotics: Types of joints used in robots Mechanisms, Descriptions	Theoretical lectures	home works

			(position, orientations, and frames).		
2	4	<b>I, II, III, VI</b>	Link properties: Link-connection description, Derivation of link transformations.	Laboratory experiments	Lab reports
3	4	<b>II</b>	MANIPULATOR KINEMATICS.	Discussion sessions	term exam
4	4	<b>I, II, VI</b>	EXAMPLE: KINEMATICS OF INDUSTRIAL ROBOT.	Projects	Project
5	4	<b>II</b>	Joint's angle: Inverse kinematics of serial robots.	Theoretical lectures	term exam
6	4	<b>I</b>	LINEAR AND ROTATIONAL VELOCITY OF RIGID BODIES	Theoretical lectures	Quizzes
7	4	<b>II</b>	Velocity propagation from link to link.	Theoretical lectures	Quizzes
8	1.5	<b>I, II</b>	Mid Term Exam		
9	4		JACOBIANS: SINGULARITIES Forces: Static force in manipulators.	Discussion sessions	
10	4	<b>II</b>	Dynamics: NEWTON'S EQUATION, EULER'S EQUATION, Iterative Newton-Euler dynamic formulation.	Theoretical lectures	Quizzes
11	4	<b>II I</b>	Dynamics: AN EXAMPLE OF CLOSED-FORM DYNAMIC EQUATIONS, THE STRUCTURE OF A MANIPULATOR'S DYNAMIC EQUATIONS	Theoretical lectures	home works
12	4	<b>I</b>	Trajectory generation: Cubic polynomials.	Theoretical lectures	home works
13	4	<b>III</b>	Trajectory generation: Linear segment with parabolic bade (LSPB).	Laboratory experiments	Lab reports
14	4	<b>I</b>	Linear Control of manipulator: FEEDBACK AND CLOSED-LOOP CONTROL, SECOND-ORDER LINEAR SYSTEMS.	Theoretical lectures	home works
15	3	<b>I</b>	Final 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)

<b>Midterm Exam</b>	2 hr	10% (10 Marks)
<b>Final Exam</b>	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>• Introduction to robotics mechanics and control, John J. Craig, SI. Units. Third ed., 2005.</li> <li>• Robotics - Modelling, Planning and Control, Bruno Siciliano • Lorenzo Sciavicco • Luigi Villani • Giuseppe Oriolo, 2009.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>• Kunz, T. and Stilman, M. (2011). Turning paths into trajectories using parabolic blends. GT-GOLEM-2011-006. Georgia Institute of Technology.</li> <li>• Q.-S. Lin, Y.-F. Yao, and J.-X. Wang, "Simulation and application of neural network PID auto-tuning controller in servo-system", IEEE 2nd International Workshop on Database Technology and Applications, 2010, pp.1-4.</li> </ul>
Recommended books and references (scientific journals, reports...)	International Journal of Advanced Robotic System
Electronic References, Websites	<a href="http://www.digitallibrary.edu.pk/Index.php">http://www.digitallibrary.edu.pk/Index.php</a>

1. Course Name:	
<b>Intelligent control</b>	
2. Course Code:	
<b>MTE 409</b>	
3. Semester / Year:	
Second Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Tut (Tutorial)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 / 2	
7. Course administrator's name	
Name: Dr. Mohammed Falah Mohammed Kanna E-mail: <a href="mailto:mohammed.falah_kanna@uomosul.edu.iq">mohammed.falah_kanna@uomosul.edu.iq</a>	
8. Course Objectives	
<b>Course Objectives</b>	<p style="text-align: right;">The objective of this course is to:</p> <ol style="list-style-type: none"> <li><b>1. Knowledge (Link to GO I)</b> Analyze and comprehend the advantages and drawbacks of intelligent controllers. Understand when to apply intelligent controllers and how to derive, develop, and apply them. This outcome will be assessed through the Quizzes, Midterm exam and Final exam.</li> <li><b>2. Knowledge (Link to GO: II)</b> Comprehend advanced mathematical models and intelligent systems and design intelligent systems for various applications. This outcome will be assessed through the Assignment, Activity, and Mini Project.</li> <li><b>3. Skills (Link to GO: III)</b> Execute experiments proficiently, analyze data accurately, and interpret results effectively to enhance decision-making in the field of intelligent control. The Mini Project will involve hands-on experiments, data analysis, and interpretation, ensuring students develop practical skills in experimenting with intelligent control concepts.</li> <li><b>4. Skills (Link to GO: VII)</b> Collaborate effectively in multi-disciplinary teams to analyze, solve problems, and meet project deadlines in the context of intelligent control systems. Activities and Mini Project will require students to</li> </ol>

work collaboratively on problem-solving tasks, emphasizing teamwork and project deadlines as essential transferrable skills.

### 9. Teaching and Learning Strategies

#### Strategy

6. Theoretical lectures
7. Discussion sessions (Activities)
8. Mini Project
9. Exam and Quizzes
10. Assignments

### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	I	An introduction to classical and intelligent control systems.	Lecture	
2	3	I, VII	Intelligent systems and applied artificial intelligence.	Lecture	Activity
3	3	I	Intelligent control concepts.	Lecture	
4	3	I	Introduction to fuzzy logic.	Lecture	
5	3	I	Fuzzy Logic, and Fuzzy Set	Lecture	Quiz
6	3	I, II	Fuzzy Logic, Membership Functions, and Standard Fuzzy Systems (SFS)	Lecture	Assignment
7	3	I, II, VII	Foundation of Fuzzy Mathematics	Lecture	Activity
8	1.5	I	<b>Midterm Exam</b>		<b>Midterm Exam</b>
9	3	I, III, VII	Fuzzy logic control and application	Lecture	Project
10	3	I	Fuzzy Neural Network – theory, design, and defuzzification	Lecture	Quiz
11	3	I, II, III, VII	Intelligent control systems: research paper analysis	Lecture	Project
12	3	I, VII	Artificial neural networks:	Lecture	Assignment

			fundamentals and architectures		
13	3	I, II, VII	Artificial neural networks: applications.	Lecture	Activity
14	3	I	Optimization of intelligent systems using GA	Lecture	
15	3	I, II, III, VII	Projects discussion.		Project evaluation

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>Zilouchian, Ali, and Mo Jamshidi, eds. Intelligent control systems using soft computing methodologies. CRC press, 2001.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>Liu, Jinkun. Intelligent control design and MATLAB simulation. Singapore: Springer, 2018.</li> </ul>
Recommended books and references (scientific journals, reports...)	<ul style="list-style-type: none"> <li>Al Sayaydeh O. N., Mohammed M. F., Alhroob E., Tao H. &amp; Lim C. P (2019), "A Refined Fuzzy Min-Max Neural Network with New Learning Procedures for Pattern Classification," <i>IEEE Transactions on Fuzzy Systems</i>, pp. 1-14.</li> <li>Mohammed M. F., &amp; Lim C. P. (2015). "An Enhanced Fuzzy Min-Max Neural Network for Pattern Classification." <i>IEEE Transactions on Neural Networks and Learning Systems</i>, vol.26, no.3, pp.417-429.</li> </ul>
Electronic References, Websites	

1. Course Name:	
<b>Engineering Management</b>	
2. Course Code:	
<b>MTE 410</b>	
3. Semester / Year:	
Second Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 / 2	
7. Course administrator's name	
1- Name: Dr. Mohammed Falah Mohammed E-mail: <a href="mailto:mohammed.falah_kanna@oomosul.edu.iq">mohammed.falah_kanna@oomosul.edu.iq</a>	
8. Course Objectives	
<b>Course Objectives</b>	<p style="text-align: right;">The objective of this course is to:</p> <ol style="list-style-type: none"> <li><b>1. Knowledge (Link to GO I)</b> Gain a comprehensive understanding of engineering management concepts, project feasibility assessments, and principles of production organization. Recognize the significance of controlling and managing risks, costs, schedules, and resources in project management. Assessment will be conducted through assignment, quizzes, midterm, and final examinations to achieve GO I.</li> <li><b>2. Knowledge (Link to GO: II)</b> Apply various operational research techniques, such as linear programming, graphical methods, and algebraic methods, to effectively design and optimize integrated systems within industrial enterprises. Practical application of these techniques will be emphasized through assignments and activities to fulfill GO II.</li> <li><b>3. Skills (Link to GO: VII)</b> Develop proficiency in collaborative teamwork within diverse, multidisciplinary teams to analyze and resolve engineering management challenges while meeting the assessments deadlines. Assessment will be conducted through Assignments and Activities to achieve GO VII.</li> </ol>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<ol style="list-style-type: none"> <li>1- Theoretical lectures</li> <li>2- Discussion sessions</li> </ol>

3- Assignments  
4- Quizzes

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	I	Concepts and objectives of Engineering Management		
2	2	I	Technical and economic studies for project feasibility.	Theoretical lectures	
3	2	I	Plant performance appraisal.	Theoretical lectures	
4	2	I	Administrative and production organization of industrial enterprises	Theoretical lectures	Quiz
5	2	I, II, VII	Using operation research in production.	Theoretical lectures	Activity
6	2	I	Midterm Exam		Midterm Exam
7	2	I, II, VII	Linear programming and Graphical method.	Theoretical lectures	Assignment
8	2	I	Algebraic method and Simplex method	Theoretical lectures	Quiz
9	2	I, II, VII	Allocation of resources.	Theoretical lectures	Assignment
10	2	I, II, VII	Quality Control and production inspection method.	Theoretical lectures	Activity
11	2	I	Industrial costs and controllable cost techniques.	Theoretical lectures	
12	2	I	Time measurement studies for production operations.	Theoretical lectures	

13	2	I	Method Time studies for production operations.	Theoretical lectures	
14	2	I	Productivity, measurement method, and techniques.	Theoretical lectures	
15	2	I	Review		

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>د. عادل عبد المالك " الهندسة الصناعية " - دار الكتب للطباعة والنشر - جامعة البصرة - الطبعة الأولى 2000</li> <li>د. خليل العاني ، د. إسماعيل إبراهيم القزاز ، د. عادل عبد المالك " أوربيل " إدارة الجودة الشاملة ومتطلبات الأيزو 2000:9001 " . الأشقر- بغداد الطبعة الأولى 2001 ، مطبعة</li> <li>Hamdy A. Taha " Operations Research: an introduction" 6th edition (1997), Prentice-Hall.</li> <li>Prem Kumar Gupta and D.S. Hira " Operations Research: an introduction" 2nd edition (1989) S. Chand &amp; Company LTD, New Delhi.</li> <li>Charles E. Ebeling "An Introduction to Reliability and Maintainability Engineering " (1997), McGraw-Hill.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>د. مازن بكر عادل وآخرون " بحوث العمليات للإدارة الهندسية " جامعة الموصل 1986</li> <li>Phillips,D.T.;Ravindran,A.;Solberg ,J." Operations Research : Principles and Practice " (1976) John Wiley</li> </ul>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Special Topics in Mechatronics</b>					
2. Course Code:					
<b>MTE 411</b>					
3. Semester / Year:					
Second Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture), Tut (Tutorial)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 / 2					
7. Course administrator's name					
Name: Dr. Aws Anaz E-mail: aws.anaz@uomosul.edu.iq					
8. Course Objectives					
Course Objectives	The students who successfully fulfill the course requirements will: 1)Have the ability read and write articles and scientific researches, <b>I, II, III, V, VI, VII</b> 2)Have experience about major field in mechatronics. <b>I, II, V, VI</b> 3)Have an ability to acquire the information and presented it. <b>I, II, III, V, VI</b>				
9. Teaching and Learning Strategies					
Strategy	1-Theoretical lectures 2-Discussion sessions				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	<b>I, II</b>	Nanotechnology systems and applications	Theoretical lectures	
2	3	<b>I, II</b>	Embedded systems design and applications	Theoretical lectures	
3	3	<b>IV, VI</b>	Electric Cars	Discussion sessions	<b>CW</b>

4	3	IV, VI	Wind energy systems design and applications	Discussion sessions	CW
5	3	I, II	Solar energy systems design and applications	Theoretical lectures	Exam
6	3	III, VII	SCADA Systems	Theoretical lectures	
7	3	IV, VI	Autotronics Engineering	Discussion sessions	
8	3	IV, VI	Intelligent systems design and applications	Discussion sessions	CW
9	3	IV, VI	Internet of Things (IOT)	Discussion sessions	HW
10	3	IV, VI	Cooling Electronics equipments	Discussion sessions	HW
11	3	III, VII	reconfigurable robot	Theoretical lectures	CW
12	3	III, VII	Gas power Plants	Theoretical lectures	
13	3	IV, VI	Writing Technical and Scientific Reports	Discussion sessions	CW
14	3	IV, VI	Cooling system in airplane	Discussion sessions	
15	3	I, II, IV, VI, VII	Final Report discussion	Discussion sessions	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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"> <li>W. Bolton, "Mechatronics", 6th Edition, Pearson Education Limited, 2016.</li> </ul>
Main references (sources)	<ul style="list-style-type: none"> <li>Well known Scientific Website about the Topics.</li> </ul>

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:	
<b>Industrial Automation II</b>	
2. Course Code:	
<b>MTE 412</b>	
3. Semester / Year:	
Second Semester / 2025-2026	
4. Description Preparation Date:	
1/9/2025	
5. Available Attendance Forms:	
CL (Class Lecture), Lab (Laboratory)	
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: Ahmad Wadollah S. Al-Sabawi Email: ahmadalsabawi@uomosul.edu.iq	
8. Course Objectives	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• Understand the fundamentals of CNC machines, including components, operation, and control systems.</li> <li>• Develop skills in CNC programming (G-code/M-code) for manufacturing precise parts.</li> <li>• Integrate CNC technology with mechatronic systems such as sensors, actuators, and automation.</li> <li>• Apply CNC machining techniques for design, prototyping, and production in engineering projects.</li> </ul>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<p>1- Class lectures</p> <p>2- lab work</p>
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understand the essential mathematical and engineering concepts for manufacturing processes.	Fundamental Geometric Principles	Lectures	
2	4	Comprehend the fundamentals of programming language and the logic of Numerical Control machines.	Fundamental principles of NC programming	Lectures	quiz
3	4	Ability to accurately define and input coordinates and points on motion axes.	Positional Data	Lectures	
4	4	Master writing movement G-codes for linear and circular tool paths.	Programming Motion Commands	Lectures	Quiz
5	4	Ability to program basic milling operations and prepare cutting paths.	Milling Cycles Part I	Lectures	
6	1.5		Midterm Exam		exam
7	4	Determine appropriate cutting speeds and feeds based on material and tool types.	Cutting Conditions I	Lectures	

8	4	Analyze factors affecting surface finish quality and tool life.	Cutting Conditions II	Lectures	
9	4	Ability to set and compensate for tool dimensions (length and radius) within the program.	Tool Offsets	Lectures	
10	4	Master the programming of Canned Cycles for complex milling operations.	Milling Cycles Part II	Lectures	
11	4	Understand the basics of programming longitudinal and face turning operations.	Turning Cycles Part I	Lectures	
12	4	Program threading operations and complex internal turning cycles.	Turning Cycles Part II	Lectures	
13	4	Acquire skills in creating 3D engineering models using CAD software.	Computer Aided Design	Lectures	
14	4	Ability to automatically generate toolpaths and NC codes from digital models.	Computer Aided Manufacturing	Lectures	
15	3	Demonstrate overall proficiency in	Final Exam		Exam

		designing and programming modern manufacturing processes.			
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### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	CNC Programming Handbook by Peter Smid, 3rd ed 2007
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Groover, Mikell P - Automation, production systems, and computer-integrated manufacturing 2018
Electronic References, Websites	<a href="https://www.cnccookbook.com/">https://www.cnccookbook.com/</a>

1. Course Name:					
<b>Robotics II</b>					
2. Course Code:					
<b>MTE 413</b>					
3. Semester / Year:					
Second Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms: `					
CL (Class Lecture), Lab (Laboratory)					
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. Omar Maarof					
Email: omarmaarof@uomosul.edu.iq					
8. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> <li>•Gain knowledge about the velocity and acceleration of rigid bodies using methods of matrix algebra for serial robots,</li> <li>•Gain the ability to apply the dynamic analysis to different robots.</li> <li>•Controlling robot's motion.</li> <li>•Students will experience self-learning techniques for any commercial Robotic system.</li> </ul>			
9. Teaching and Learning Strategies					
Strategy		1-Robotics laboratory 2-On-class lectures			
10. Course Structure					
Wee k	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	I	<b>Introduction to robotics II</b>	lectures	classwork
2	4	I	Differentiation of position vectors, Velocity transformation	lectures	Classwork
3	4	I	Velocity propagation from link to link: <b>Jacobian matrix</b> , Singularity	lectures	Classwork
4	4	I	<b>Forces</b> , Static force in manipulators.	lectures	Classwork
5	4	I	<b>Dynamics</b> , Iterative Newton-Euler dynamic formulation.	lectures	Quiz
6	4	I	<b>Dynamics</b> , Iterative Newton-Euler dynamic formulation.	lectures	Classwork Homework
7	4	I	<b>Dynamics</b> , Iterative Newton-Euler dynamic formulation.	lectures	Classwork
8	1.5	I	<b>Midterm Exam</b>		Midterm exam
9	4	I	<b>Trajectory generation</b> , Cubic polynomials, LSPB.	lectures	Classwork Homework
10	4	I	<b>Trajectory generation</b> , Cubic polynomials, LSPB.	lectures	Classwork Homework

11	4	I	<b>Control</b> , Linear and Nonlinear Control of manipulator.	lectures	Classwork Homework
12	4	I	<b>Control</b> , Linear and Nonlinear Control of manipulator.	lectures	Classwork Homework
13	4	I	<b>Control</b> , Linear and Nonlinear Control of manipulator.	lectures	Mini Project
14	4	I	<b>Mobile robots</b> , Kinematics, sensors, path generation.	lectures	Quiz
15	4	I	<b>Mobile robots</b> , Kinematics, sensors, path generation.	lectures	Classwork Homework

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks	Introduction to robotics mechanics and control, John J. Craig, SI. Units. Third ed., 2005.
Main references	Robotics - Modelling, Planning and Control, Bruno Siciliano • Lorenzo Sciavicco • Luigi Villani Giuseppe Oriolo, 2009.
Recommended books and references (scientific journals, reports...)	<a href="https://ocw.mit.edu/courses/2-12-introduction-to-robotics-fall-2005/pages/syllabus/">https://ocw.mit.edu/courses/2-12-introduction-to-robotics-fall-2005/pages/syllabus/</a>
Electronic References, Websites	<a href="https://www.ieee-ras.org/">https://www.ieee-ras.org/</a>

1. Course Name:					
<b>Computer interface</b>					
2. Course Code:					
<b>MTE 415</b>					
3. Semester / Year:					
Second Semester / 2025-2026					
4. Description Preparation Date:					
2025/9/1					
5. Available Attendance Forms:					
CL (Class Lecture), Lab (Laboratory)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4 / 3					
7. Course administrator's name					
1- Name: Dr. Zead Mohammed Yosif E-mail: <a href="mailto:zmyousif@uomosul.edu.iq">zmyousif@uomosul.edu.iq</a>					
8. Course Objectives					
Course Objectives		<p>The students after successfully complete the course are able to:</p> <p>1-Linked to Go I Have deep understanding of PC Interface systems and types. This objective will achieve the GO I through the Quizzes, Midterm exam and Final exam.</p> <p>2-Linked to Go II &amp; III Acquire the ability to develop pc interfaces software using various Programming language. This objective will achieve the GOII &amp; III through the Assignment, and Activity.</p> <p>3-Linked to Go III Design and Model Parts or Whole Mechatronic System. This objective will achieve the GO III through the final project.</p>			
9. Teaching and Learning Strategies					
Strategy		<p>1-Theoretical lectures 2-Discussion sessions 3-Laboratory experiments 4-Projects 5- Quizzes. 6- Assignments</p>			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	4	<b>I</b>	Introduction to computer interface and Data Acquisition.	Theoretical lecture	
2	4	<b>I, II</b>	Analog Signal Transmission, Wire and cable options, Noise and Ground, Zero and Span	Theoretical lecture	Homework
3	4	<b>I</b>	Cct (Inverting Summer, Instrument Amplifier)	Theoretical lecture	Quiz
4	4	<b>II, III</b>	Signal Conditioning, Isolation Amplifier, Transformer-coupled Amplifiers, Optically Coupled	Theoretical lecture	<b>Classwork and discussion</b>
5	4		Amplifiers.	Theoretical lecture	
6	4	<b>II, III</b>	Analog to Digital and Digital to Analog Conversion: Sample and Hold circuits, Analog,	Theoretical lecture	Homework
7	1.5	<b>I</b>	Mid-term exam		<b>Midterm exam</b>
8	4		Analog to digital Converters, Digital to analog Converters, Examples of sensors with signal		
9	4	<b>I</b>	conditioned output.	Theoretical lecture	<b>Quiz</b>

10	4	II, III	Microprocessor Addressing System: Memory Mapped Addressing, I/O Addressing.	Theoretical lecture	Classwork and discussion
11	4		Computer Parallel Port: Architecture	Theoretical lecture	
12	4	II, III	Address decoder Design, Assembly Language for I/O	Theoretical lecture	Homework
13	4		Programmable Peripheral Interface (PPI), Advantage, Addressing	Theoretical lecture	
14	4		PPI Examples	Theoretical lecture	
15	4	I	Computer Parallel Port: Architecture	Theoretical lecture	Quiz

### 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.

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Kevin James, "PC Interfacing and Data Acquisition: Techniques for Measurement, Instrumentation and Control"
Main references (sources)	In the library, there are many Automations books that can be used as reference books
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
<b>Statistics II</b>					
2. Course Code:					
<b>MTE 416</b>					
3. Semester / Year:					
Second Semester / 2025-2026					
4. Description Preparation Date:					
1/9/2025					
5. Available Attendance Forms:					
CL (Class Lecture)					
6. Number of Credit Hours (Total) / Number of Units (Total)					
2 / 2					
7. Course administrator's name (mention all, if more than one name)					
Name: Dr. Farhad E. Mahmood Email: farhad.m@uomosul.edu.iq					
8. Course Objectives					
Course Objecti	<ul style="list-style-type: none"> <li>• Provide students with advanced concepts in probability and statistics with emphasis on engineering applications in measurement, quality control, data analysis, and decision-making.</li> <li>• Develop students' ability to apply statistical techniques to analyze engineering systems and experimental data and interpret results in a professional context.</li> <li>• Enable students to work with continuous probability distributions, conduct hypothesis testing, develop regression models, and apply statistical tools in real engineering projects.</li> </ul>				
9. Teaching and Learning Strategies					
Strategy	Lectures, problem-solving sessions, statistical software demonstrations, and in-class case studies. Students are expected to engage in individual and group exercises analyzing real engineering data. Weekly problem sets reinforce theoretical concepts with practical applications.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understand discrete distributions, probability concepts, expectation and variance	Review of Engineering Statistics I	Lecture / Discussion	Quiz
2	2	Define and work with continuous random variables and their properties	Continuous Random Variables and Distributions	Lecture / Examples	Problem Set
3	2	Compute probabilities using PDF and CDF; relate the two functions	PDF and CDF	Lecture / Problem Solving	Assignment

4	2	Apply uniform and exponential distributions to engineering reliability problems	Fundamental Continuous Distributions	Lecture / Case Study	Quiz
5	2	Use the normal curve, Z-scores, and statistical tables	Normal Probability Distribution	Lecture / Practice Problems	Problem Set
6	2	Apply t, chi-square, and F distributions in engineering analysis	Distributions Derived from Normal	Lecture / Worked Examples	Quiz
7	2	Understand sampling distributions and apply the CLT	Sampling Theory and Central Limit Theorem	Lecture / Simulation	Assignment
8	2	Construct confidence intervals for mean, variance, and proportion	Statistical Estimation and Confidence Intervals	Lecture / Lab Exercise	Midterm Exam
9	2	Formulate hypotheses and conduct Z-test and t-test for engineering decisions	Hypothesis Testing	Lecture / Case Studies	Problem Set
10	2	Build and interpret linear regression models for engineering data	Correlation and Simple Linear Regression	Lecture / Data Analysis	Assignment
11	2	Apply one-way ANOVA and understand experimental design principles	ANOVA and Design of Experiments	Lecture / Group Work	Final 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

Assessment Type	Number / Duration	Marks
Quizzes	2	10% (10 Marks)
Assignments	5	10% (10 Marks)
Project / Lab	1	10% (10 Marks)
Report	1	10% (10 Marks)
Midterm Exam	2 hr	10% (10 Marks)
Final Exam	3 hr	50% (50 Marks)
<b>Total</b>		<b>100% (100 Marks)</b>

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Walpole, R.E., Myers, R.H., Myers, S.L., Ye, K. (2012). Probability & Statistics for Engineers and Scientists, 9th ed., Pearson.
Main references (sources)	Montgomery, D.C., Runger, G.C. (2014). Applied Statistics and Probability for Engineers, 6th ed., Wiley.

<p>Recommended books and references (scientific journals, reports...)</p>	<p>Devore, J.L. (2016). Probability and Statistics for Engineering and the Sciences, 9th ed., Cengage.   Engineering statistics journals and IEEE publications.</p>
<p>Electronic References, Websites</p>	<p>NIST/SEMATECH e-Handbook of Statistical Methods:  <a href="https://www.itl.nist.gov/div898/handbook/">https://www.itl.nist.gov/div898/handbook/</a>    Khan Academy Statistics:  <a href="https://www.khanacademy.org/math/statistics-probability">https://www.khanacademy.org/math/statistics-probability</a></p>