

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



# **Academic Program and Course Description Guide**

**2024 - 2025**

## **Introduction:**

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

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

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## Concepts and terminology:

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

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

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

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

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

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

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

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

## Academic Program Description Form

**University Name:** Al – Furat Al – Awsat Technical University  
**Faculty/Institute:** Babylon Technical Institute  
**Scientific Department:** Mechanical Power Technologies Department  
**Academic or Professional Program Name:** Technical Diploma  
**Final Certificate Name:** Diploma in Mechanical Power Technologies  
**Academic System:** Annual  
**Description Preparation Date:** 1 / 12 /2024  
**File Completion Date:** 8 / 12 /2024

**Signature:**  
**Head of Department Name:**  
**Lec. Dr. Israa Adnan Najem**

**Date:** / 1 /2025

**Signature:**  
**Scientific Associate Name:**  
**Ass. Prof. Dr. Oras khudhayer Obayes**

**Date:** / 1 /2025

**The file is checked by:**  
**Department of Quality Assurance and University Performance**  
**Director of the Quality Assurance and University Performance Department:**  
**Ass. Prof. Khansaa Azeez Obayes**

**Date:** / 1 /2025

**Signature:**

**Approval of the Dean**

**Ass. Prof. Dr. Oras khudhayer Obayes**

## Academic program description

<b>1. Academic Department</b>	<b>Power Mechanics Technology Department</b>
<b>2. Name of Academic or Professional Program</b>	<b>Automotive Branch</b>
<b>3. Date of Preparation of this Description</b>	<b>8 / 12 /2024</b>
<b>4. Name of Final Certificate</b>	<b>Technical Diploma</b>
<b>5. Academic System</b>	<b>Annual</b>
<b>6. Accredited Accreditation Program</b>	<b>ABET</b>
<b>7. Other External Influences</b>	<b>Automotive Companies - Manufacturing Departments That Contain Machinery Workshops - Private Sector</b>

## 1. Program Vision

The Department of Power Mechanics is one of the main technological departments. The department is moving towards expanding the base of technical education and its modern applications to be a leader in providing certified technical services and a spirit of competition and cooperation with the community.

## 2. Program Mission

The Department of Power Mechanics adopts a general message based in its general form on the framework of technical education in Iraq, a message that it seeks to achieve every year to highlight the department's distinctive face. The general objectives focus on graduating national technical cadres at the level of technical development to keep pace with rapid global technical developments. The special message includes the following: -

- Using computer and Internet technologies in education and training
- Activating the relationship with the private sector in the fields of training
- Following up on the development of curricula and training plans and then updating laboratories and workshops
- Interacting with the market and the needs of society in rehabilitation and training

## 3. Program Objectives

**Branch Objective:** - The department aims to prepare specialized cadres to work in government company workshops and in the private sector capable of:

1. The ability to identify mechanical and electrical faults in cars using modern devices.
2. Carry out periodic maintenance work for gasoline and diesel cars.
3. The ability to manage and operate service and maintenance stations.

## 4. Program Accreditation

No

## 5. Other external influences

No, there is no donor

## 6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	23	64	%35	All courses are core and there are no electives
College Requirements	23	64	%35	All courses are core and there are no electives
Department Requirements	21	61	%33	All courses are core and there are no electives
Summer Training	\	\	\	All courses are core and there are no electives
Other	\	\	\	

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

<b>7. Program Description</b>				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
1	<b>Cm1</b>	Car maintenance (1)	2	3
	<b>CE1</b>	Car Electricity (1)	1	2
	<b>EM</b>	Engineering mechanics	2	1
	<b>MA</b>	Mathematics	2	-
	<b>CA</b>	Computer applications	1	1
	<b>ML</b>	Mechanics lab	-	4
	<b>ED</b>	Engineering Drawing	-	3
	<b>RD</b>	Rights and democracy	2	-
	<b>FT</b>	Fluids and Thermodynamics	2	1
	<b>EL</b>	English language	1	-
	<b>AL</b>	Arabic language	1	-
2	<b>CM</b>	Car mechanic	2	-
	<b>IC</b>	Internal combustion engines	2	2
	<b>CB</b>	Car body	1	2
	<b>CM</b>	Car maintenance (2)	2	6
	<b>CE2</b>	Car Electricity (2)	1	2
	<b>MC</b>	Modern Car technology	1	2
	<b>IM</b>	Industrial management	2	-
	<b>ID</b>	Industrial drawing	-	3
	<b>CA</b>	Computer applications	1	2
	<b>P</b>	Project	1	-
	<b>EL</b>	English language	1	-
	<b>AL</b>	Arabic language	1	-
	<b>B C</b>	Baath crimes	2	-
<b>8. Expected learning outcomes of the program</b>				
<b>Knowledge</b>				
1- Identifying car parts and how each one works. 2- Identifying faults. 3- Using modern devices. 4- General knowledge of computers.		<ul style="list-style-type: none"> <li>• Become able to identify faults</li> <li>• Keep up with the developments in technology</li> <li>• Use the calculator with high professionalism</li> </ul>		
<b>Skills</b>				
Operating and maintaining cars.		Work on modern devices. Working in state departments. Working on the computer		
Determine fault, oil selection and maintenance		Work on modern devices. Working on the computer		
<b>Ethics</b>				
1- Written lectures. 2- Practical training.		<ul style="list-style-type: none"> <li>• He can take the exam</li> <li>• He applies what he has studied</li> </ul>		
<b>9. Teaching and Learning Strategies</b>				
1. Written lectures.				

2. Practical training.
3. Videos using the data viewer.
4. Scientific visits

### 10. Evaluation methods

1. Continuous testing.
2. Pre and post questions.
3. Semester and final exams.

### 11. Faculty

#### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Assistant Professor	Mechanical engineering	thermal combustion systems		1	
Lecture	Electrical power engineering	Electrical power engineering		1	
Lecture	Mechanical engineering	Refractory specialty		1	
Lecture	Mechanical engineering	Engineering education technology		1	
Lecture	Mechanical engineering	Specialization in applied mechanics		2	
Lecture	Materials engineering	Ceramic engineering and building materials		1	
Lecture	Materials engineering	Ceramic engineering		1	
Lecture	Master's degree in Physics	Physics		1	
Lecture assistant	Electrical power engineering	Electrical power engineering		1	
Lecture assistant	Mechanical engineering	Mechanical automation I		1	
Lecture assistant	Math Science	Dynamic topology		1	

#### Professional Development

##### Mentoring new faculty members

The head of the department received the new appointees, welcomed them, and directed them to their workplaces in the department, each according to their specialization and academic achievement, so that they could perform the work assigned to them in the best way, for the purpose of continuing the scientific and educational process and directing it in the correct manner in a way that serves the interest of the department and the institution in general.

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

- 1- Teamwork within the group effectively and actively
- 2- Manage time effectively and set priorities with the ability to work on regular schedules
- 3- Leadership and the ability to direct and motivate others
- 4- Independence at work.

### **12. Acceptance Criterion**

- 1- Iraqi nationality
- 2- Possession of an Iraqi preparatory school certificate supported by certification from the General Directorate of Education in the governorate or an equivalent certificate.
- 3- The student must be born in 1994 onwards.
- 4- Successful in the medical examination according to the conditions for each study, and the blind student (who meets the conditions for applying for appropriate humanitarian studies) will be submitted through central admission.
- 5- Devoted to study. It is not permissible to combine work and study (at the same time) in colleges and morning institutes. This includes employees of all government institutions. In order for them to continue studying, they must obtain a study leave from their departments starting in accordance with the instructions in force. It is not permissible to combine two studies either, and in the event of a dispute being proven. He writes to the Ministry to cancel his acceptance (the student employee can postpone his studies according to the instructions in order to fulfill the condition of completing two years of service - satisfactory to be entitled to obtain study leave and in accordance with the instructions for granting study leave).
- 6- Among my graduates:
  - A- The current academic year.
  - B- The previous academic year of those who are not centrally accepted into any college or institute, and they are accepted according to the minimum limits for the year of their graduation, and if it is proven that  
The student's acceptance into any college or institute will be returned to his original acceptance and it will be considered a year of failure for him.
- 7- Non-Iraqi students who hold an Iraqi preparatory certificate and are accepted centrally will be notified in writing to review the Central Admissions Department / Expatriates Division to state their exemption or demands for tuition fees in foreign currency according to the controls in Chapter Seven.

### **13. The most important sources of information about the program**

1. Methodical books.
2. Lectures.
3. Internet

### **14. Program Development Plan**

1. Holding scientific seminars
2. Holding internal courses
3. Participation in external courses.

Program Skills Outline															
				Required program Learning outcomes											
Year/ Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
1	Cm1	Car maintenance (1)	Basic	*				*				*			
	C1	Car Electricity (1)	Basic	*				*				*			
	EM	Engineering mechanics	Basic	*				*				*			
	MA	mathematics	Assistant	*				*				*			
	CA	Computer applications	Assistant	*				*				*			
	ML	Mechanics lab	Basic	*				*				*			
	ED	Engineering Drawing	Basic	*				*				*			
	RD	Rights and democracy	Assistant	*				*				*			
	FT	Fluids and thermodynamics	Basic	*				*				*			
	EL	English language	Assistant	*				*				*			
	AL	Arabic language	Assistant	*				*				*			
2	CM	Car mechanic	Basic	*				*				*			

	<b>IC</b>	<b>Internal combustion engines</b>	Basic	*				*				*			
	<b>CB</b>	<b>car bodies</b>	Basic	*				*				*			
	<b>CM</b>	<b>Car maintenance (2)</b>	Basic	*				*				*			
	<b>CE2</b>	<b>Car Electricity (2)</b>	Basic	*				*				*			
	<b>MC</b>	<b>Modern Car technology</b>	Basic	*				*				*			
	<b>IM</b>	<b>Industrial management</b>	Assistant	*				*				*			
	<b>ID</b>	<b>Industrial drawing</b>	Assistant	*				*				*			
	<b>CA</b>	<b>Computer applications</b>	Assistant	*				*				*			
	<b>P</b>	<b>Project</b>	Basic	*				*				*			
	<b>EL</b>	<b>English language</b>	Assistant	*				*				*			
	<b>AL</b>	<b>Arabic language</b>	Assistant	*				*				*			
	<b>BC</b>	<b>Baath crimes</b>	Assistant	*				*				*			

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

**Stage 1: -****Course Description Form**

1. Course Name		<b>Car Electricity (1)</b>			
2. Course Code		CE 1			
3. Semester / Year:		First Stage / Annual Course			
4. Description Preparation Date		<b>8 / 12 /2024</b>			
5. Available Attendance Forms:		Theoretical and practical study			
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Zena Salah Hasan					
Email: <a href="mailto:zena@atu.edu.iq">zena@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives		<b>Teaching the student electrical terminology, types of connections, and parts of the electric car</b>			
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	A brief history of the car, an explanation of the tools, tools and devices used in car maintenance, the basic car components (chassis, engine, clutch, powertrain, drive shaft, rear axle, front axle, suspension, steering)	Lectures and practical training	Oral exams And practical training
2	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Types of gasoline engines (four-stroke, two-stroke). Explanation of four-stroke engines	Lectures and practical training	Oral exams And practical training
3	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Kirchhoff's first and second laws, mathematical problems, a set of definitions	Lectures and practical training	Oral exams And practical training
4	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Types of electrical circuits (to connect resistors), series, parallel, mixed, mathematical problems	Lectures and practical training	Oral exams And practical training

5	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	The energy sources in the car include (the battery, types of batteries, battery components, charging methods for all types)	Lectures and practical training	Oral exams And practical training
6	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Solutions used for the three types of batteries, methods of chemical reactions, devices used to test solutions, maintenance methods, measuring solution density.	Lectures and practical training	Oral exams And practical training
7	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Connecting energy sources (batteries) to the electrical circuit in three types, connecting sources in series, parallel, and mixed, connection characteristics for each case.	Lectures and practical training	Oral exams And practical training
8	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Mathematical problems to calculate the final value of the energy source in an electrical circuit	Lectures and practical training	Oral exams And practical training
9	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	A general idea about alternating current, definitions of alternating current, and reasoning about which part of the car works	Lectures and practical training	Oral exams And practical training
10-12	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Magnetism, general properties of magnetism, definitions of types of magnets, lines of magnetic force, Magnetic flux density B, magnetic field intensity $\hat{H}$ , magnetic flux $\phi$ , magnetic flux conductivity $\theta$ . The relationship between electrical energy and magnetic energy, how to convert between the two energies, Oersted phenomenon, Faraday's law, Lenz's law, Electromagnetic induction, types of induction, self-induction, mutual induction, kinetic induction	Lectures and practical training	Oral exams And practical training
13-14	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	The charging circuit in the car, a general idea about the direct current (DC) generator, its parts, components, principle of operation, general diagram of the generator's electrical circuit.	Lectures and practical training	Oral exams And practical training
15-16	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Charging circuit for an alternating current (AC) generator, its parts, components, working principle, general diagram of the generator's electrical circuit	Lectures and practical training	Oral exams And practical training
17-18	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	The starter motor (the predecessor), its parts, components, principle of operation, general diagram of the electrical circuit of the motor	Lectures and practical training	Oral exams And practical training
19-20	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Ignition system, first generation (regular), parts, working principle, general diagram of the electrical circuit of the system.	Lectures and practical training	Oral exams And practical training
21	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Mug candles, parts, working principle, maintenance and inspection, general diagram of the electric circuit for a mug candle	Lectures and practical training	Oral exams And practical training
22-23	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Main, side and interior lighting system, components, working principle, general scheme of the systems	Lectures and practical training	Oral exams And practical training

24-25	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Auxiliary devices in the car, (fuel gauge, oil pressure gauge, charging current gauge, temperature gauge)	Lectures and practical training	Oral exams And practical training
26	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	The electrical circuit to control car doors and windows (opening and closing)	Lectures and practical training	Oral exams And practical training
27	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Car air conditioning and heating devices (electrical system)	Lectures and practical training	Oral exams And practical training
28	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	Windshield wiper device (electrical circuit), fuel pump device (electrical circuit)	Lectures and practical training	Oral exams And practical training
29-30	Theoretical=2 Practical=3	Teaching the student to identify faults -Maintenance of fault	The electrical circuit for audio and video audio, the early warning system against theft, the electrical circuit	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Automotive Electrical Systematic Book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name	Car maintenance (1)				
2. Course Code	Cm1				
3. Semester / Year	First Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total):	<b>150 Hours / 10 Units</b>				
7. Course administrator's name (mention all, if more than one name)					
Name: Laith Salim Kamal					
Email: <a href="mailto:Layth.kamal@atu.edu.iq">Layth.kamal@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives			Teaching the student about car breakdowns and how to maintain them		
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	A brief history of the car, an explanation of the tools, tools and devices used in car maintenance, the basic car components (chassis, engine, clutch, powertrain, drive shaft, rear axle, front axle, suspension, steering)	Lectures and practical training	Oral exams And practical training
2	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Types of gasoline engines (four-stroke, two-stroke). Explanation of four-stroke engines	Lectures and practical training	Oral exams And practical training
3	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Kirchhoff's first and second laws, mathematical problems, a set of definitions	Lectures and practical training	Oral exams And practical training
4	theoretical=2 Practical=3	Teaching the student about car breakdowns	Types of electrical circuits (to connect resistors), series, parallel, mixed, mathematical problem.	Lectures and	Oral exams And practical training

		and how to maintain them		practical training	
5	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	The energy sources in the car include (the battery, types of batteries, battery components, charging methods for all types)	Lectures and practical training	Oral exams And practical training
6	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Solutions used for the three types of batteries, methods of chemical reactions, devices used to test solutions, maintenance methods, measuring solution density.	Lectures and practical training	Oral exams And practical training
7	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Connecting energy sources (batteries) to the electrical circuit in three types, connecting sources in series, parallel, and mixed, connection characteristics for each case.	Lectures and practical training	Oral exams And practical training
8	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Mathematical problems to calculate the final value of the energy source in an electrical circuit	Lectures and practical training	Oral exams And practical training
9	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	A general idea about alternating current, definitions of alternating current, and reasoning about which part of the car works	Lectures and practical training	Oral exams And practical training
10-12	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Magnetism, general properties of magnetism, definitions of types of magnets, lines of magnetic force, Magnetic flux density B, magnetic field intensity $\hat{H}$ , magnetic flux $\phi$ , magnetic flux conductivity $\theta$ The relationship between electrical energy and magnetic energy, how to convert between the two energies, Oersted phenomenon, Faraday's law, Lenz's law, Electromagnetic induction, types of induction, self-induction, mutual induction, kinetic induction	Lectures and practical training	Oral exams And practical training
13-14	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	The charging circuit in the car, a general idea about the direct current (DC) generator, its parts, components, principle of operation, general diagram of the generator's electrical circuit.	Lectures and practical training	Oral exams And practical training
15-16	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Charging circuit for an alternating current (AC) generator, its parts, components, working principle, general diagram of the generator's electrical circuit	Lectures and practical training	Oral exams And practical training

17-18	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	The starter motor (the predecessor), its parts, components, principle of operation, general diagram of the electrical circuit of the motor	Lectures and practical training	Oral exams And practical training
19-20	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Ignition system, first generation (regular), parts, working principle, general diagram of the electrical circuit of the system.	Lectures and practical training	Oral exams And practical training
21	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Mug candles, parts, working principle, maintenance and inspection, general diagram of the electric circuit for a mug candle	Lectures and practical training	Oral exams And practical training
22-23	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Main, side and interior lighting system, components, working principle, general scheme of the Systems	Lectures and practical training	Oral exams And practical training
24-25	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Auxiliary devices in the car, (fuel gauge, oil pressure gauge, charging current gauge, temperature gauge)	Lectures and practical training	Oral exams And practical training
26	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	The electrical circuit to control car doors and windows (opening and closing)	Lectures and practical training	Oral exams And practical training
27	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Car air conditioning and heating devices (electrical system)	Lectures and practical training	Oral exams And practical training
28	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	Windshield wiper device (electrical circuit), fuel pump device (electrical circuit)	Lectures and practical training	Oral exams And practical training
29-30	theoretical=2 Practical=3	Teaching the student about car breakdowns and how to maintain them	The electrical circuit for audio and video audio, the early warning system against theft, the electrical circuit	Lectures and practical training	Oral exams And practical training

#### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

#### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Modern car maintenance book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name	Fluid				
2. Course Code	F.T. D				
3. Semester / Year:	First Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Zahraa Kazem Rodhan					
Email: <a href="mailto:zahraakaz78@atu.edu.iq">zahraakaz78@atu.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		Teaching the student the basic concepts of fluid mechanics and thermodynamic			
9. Teaching and Learning Strategies					
<b>Strategy</b>	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Types of unit systems, density, specific volume, pressure, temperature (Celsius and absolute), Properties of fluids: difference between fluids and solid metals, difference between liquids and gases	Lectures and practical training	Oral exams And practical training
2	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Definition of density, relative density, specific weight, specific volume, ideal fluid, real fluid, examples.	Lectures and practical training	Oral exams And practical training

3	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Shear stress, dynamics of fluid flow, Newton's Law of viscosity, dynamic viscosity, kinematic viscosity, surface tension. - Capillarity, liquid vapor pressure,	Lectures and practical training	Oral exams And practical training
4-6	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Pressure, liquid pressure head, Pascal law of pressure, variation of liquid pressure head with respect to gravity, pressure at a datum for stationary liquid. Absolute pressure, gage pressure, barometer, pressure gage equipment. Bourdon gage, Piezometer, U tube manometer, comparative gage.	Lectures and practical training	Oral exams And practical training
7	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Fluid motion, fluid flow, pressure of fluid flow, laminar flow, turbulent flow, velocity profile of flow, Reynold's number.	Lectures and practical training	Oral exams And practical training
8	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Flow rate, volumetric flow rate, mass flow rate, - Continuity equation, problems on continuity equation for incompressible fluids.	Lectures and practical training	Oral exams And practical training
9-11	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Bernoulli equation and application.	Lectures and practical training	Oral exams And practical training
12-14	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	First law of thermodynamics, kinds of energy, (dynamic energy, potential mechanical energy, internal energy, heat, work), work of a system represented on pressure – volume diagram, energy of flow, enthalpy, energy – conservation equation of first law of thermodynamics. Classifications of systems, application of first law of thermodynamics on closed systems, energy equation for steady flow, some application on first law for steady state open systems, application on first law for steady state open systems, application on (nozzle, diffuser, though, condenser, boiler, turbine, compressor, heat exchanger, open plane), representation of work for open systems for steady flow on pressure volume diagram, examples.	Lectures and practical training	Oral exams And practical training
15	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Second law of thermodynamics: Reversible process, entropy, temperature-entropy diagram, coordinates place on T-S diagram, cycles, work of cycle, thermal efficiency of cycle, examples. State of second law for heat engine, and for heat pump.	Lectures and practical training	Oral exams And practical training
16-19	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Ideal Gas: Specific heat at constant volume, specific heat at constant pressure, equation of ideal gas state, gas constant, universal gas constant. Constant volume process, constant pressure process, constant temperature process, studying of process on P – V diagram and T – S diagram, examples.	Lectures and practical training	Oral exams And practical training
20-24	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Adiabatic process, isentropic process, studying of process on P-V diagram and T-S diagram, examples. standard air cycles: Carnot cycle, reversed carnot cycle, studying of cycle on P – V diagram and T – S diagram, examples.	Lectures and practical training	Oral exams And practical training

			Auto cycle, diesel cycle, studying of cycle on P – V diagram and T – S diagram, calculating heat changed, work and efficiency of each cycle. Combined cycle, studying of cycle on P – V diagram and T – S diagram, finding heat changed, work, efficiency, parameters affecting on standard air cycle efficiency, comparison between, Auto, diesel, dual cycles), examples.		
25-28	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Heat transfer by conduction: Steady state heat conduction, conduction through homogenous plane wall, conduction through composite wall, thermal resistance, heat conduction through homogenous cylindrical wall, heat conduction through multi layers cylindrical wall, examples.	Lectures and practical training	Oral exams And practical training
29-30	theoretical=2 Practical=1	Teaching the student, the basic concepts of fluid mechanics and thermodynamics	Heat exchangers and their types, logarithmic mean temperature difference, calculations of heat exchangers, effectiveness of heat exchangers, examples.	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Modern car maintenance book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	<b>Engineering Drawing</b>				
2. Course Code:	ED				
3. Semester / Year:	First Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Alaa Shaker Aobida Email: <a href="mailto:alaashaker2025@gmail.com">alaashaker2025@gmail.com</a>					
8. Course Objectives					
Course Objectives		Teaching the student to perform engineering drawing using the AutoCAD program			
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	The importance of engineering drawing - The importance of using a computer to implement engineering drawing - Drawing board sizes (standard) - An overview of the AutoCAD program	Lectures and practical training	Oral exams And practical training
2	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Types of lines in engineering drawing - using drop-downs for lines and texts	Lectures and practical training	Oral exams And practical training

3-4	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Basic shapes	Lectures and practical training	Oral exams And practical training
5-6	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing adjustments - Drawing aids	Lectures and practical training	Oral exams And practical training
7-8-9	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Engineering operations - dimensioning - applications to previous concepts	Lectures and practical training	Oral exams And practical training
10-11-12-13	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Perspective Drawing - Drawing a perspective containing a circle, rectangle, triangle and polygon	Lectures and practical training	Oral exams And practical training
14-15	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Projection theory - drawing simple projections	Lectures and practical training	Oral exams And practical training
16-17	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Placing dimensions on perspective and projections	Lectures and practical training	Oral exams And practical training
18-19-20	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Conclusion of the third site from two sites	Lectures and practical training	Oral exams And practical training
21-22-23	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Cutting theory - shapes of cutting lines according to the material - drawing cut sections	Lectures and practical training	Oral exams And practical training
24-25-26	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing projections cut from a specific projection	Lectures and practical training	Oral exams And practical training
28-27	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing partially cut projections	Lectures and practical training	Oral exams And practical training
30-29	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Applications and projects	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

- 1- 15 marks for practical. for the first semester
- 2- 15 marks for practical. for the second semester
- 3 - 10 marks for student activities
- 4 - 60 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering drawing book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Stage 2: -

### Course Description Form

1. Course Name	Car mechanic				
2. Course Code	CM				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms	Theoretical study				
6. Number of Credit Hours (Total) / Number of Units (Total):	<b>60 Hours / 4 Units</b>				
7. Course administrator's name (mention all, if more than one name)					
Name: Sarah Salim Hasan Email: <a href="mailto:sara.hassan.iba101@atu.edu.iq">sara.hassan.iba101@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives		Teaching the student the basic concepts of automobile mechanics and how to solve problems			
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Automotive performance, the total resistance affecting car motion	Lectures and practical training	Oral exams And practical training
2	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Traction effort	Lectures and practical training	Oral exams And practical training
3-4	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Surplus effort & examples	Lectures and practical training	Oral exams And practical training

5-6	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Gears, types gearing system, motion between two gears, selecting the best gear ratio, rear axle ratio, overall gear ratio examples	Lectures and practical training	Oral exams And practical training
7	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Bearing types, calculations and design of sliding bearing	Lectures and practical training	Oral exams And practical training
8	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Shafts, types, calculation and design of the shafts	Lectures and practical training	Oral exams And practical training
9-10-11	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Clutch, types, design, power transmitted, calculation	Lectures and practical training	Oral exams And practical training
12-13-14-15	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Belts. types, system types, calculation of power transmitted from flat and v. type.	Lectures and practical training	Oral exams And practical training
16-17-18-19-20	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Brakes, type's systems function, calculation of stopping distance, deceleration, load transfer during brake, braking force on front and rear wheel, wheel piston diameter, all these calculations based on disc and shoes brake type.	Lectures and practical training	Oral exams And practical training
21-22	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Suspension system types advantages and disadvantages Calculation of leaf and coil spring	Lectures and practical training	Oral exams And practical training
23-24	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Steering system, calculations, types	Lectures and practical training	Oral exams And practical training
25-26	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Overturning and sliding speed	Lectures and practical training	Oral exams And practical training
27	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Piston, types, calculation of thermal and tensile stress	Lectures and practical training	Oral exams And practical training
28	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Crankshaft, types, calculation of thermal and tensile stress	Lectures and practical training	Oral exams And practical training
29-30	theoretical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Study of various design car system (car with front engine mounted and rear wheel drive, car with front engine and rear wheel drive, car with rear engine mounted and wheel drive system)	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed  
1- 15 marks for the first theoretical semester  
2- 15 marks for the second semester, theoretical  
3 - 10 marks for student activities  
4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Automotive mechanics textbook
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	<b>Internal combustion engines</b>				
2. Course Code:	I.C. E				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	Theoretical study and practical				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>120 Hours / 8 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Ali Assim Abd Al-Razak Email: <a href="mailto:ali.nit2009@atu.edu.iq">ali.nit2009@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives		<b>Teaching the student the basic concepts of automobile mechanics and how to solve problems</b>			
9. Teaching and Learning Strategies					
Strategy	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Basic engine nomenclature	Lectures and practical training	Oral exams And practical training
2	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Four – stroke cycle spark – ignition engine four – stroke cycle compression ignition engine	Lectures and practical training	Oral exams And practical training

3	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Valves timing for 4- stroke engine	Lectures and practical training	Oral exams And practical training
4	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Two – stroke engine, comparison of two stroke and four stroke engine, valves timing for 2- stroke engine	Lectures and practical training	Oral exams And practical training
5	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Save engine systems for 2- stroke engines	Lectures and practical training	Oral exams And practical training
6-7-8	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Engine performance and resting, performance parameters for 4- strike engine and 2- stroke engine, basic measurements indications	Lectures and practical training	Oral exams And practical training
9-10-11	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Performance of S. I. Engine performance of C. I. Engine Illustrative examples	Lectures and practical training	Oral exams And practical training
12	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Engine heat balance sheet	Lectures and practical training	Oral exams And practical training
13	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Effect of strength mixture (Fr) on engine performance factors	Lectures and practical training	Oral exams And practical training
14	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Combustion in S. I. Engines stages of combustion in S. I. Engine	Lectures and practical training	Oral exams And practical training
15	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Inject of engine variable on stages of combustion in S. I. Engine	Lectures and practical training	Oral exams And practical training
16	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Detonation or knocking in S. I. Engine effects of detonation	Lectures and practical training	Oral exams And practical training
17	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Control of duration , pre-ignition , effect of pre-ignition on engine	Lectures and practical training	Oral exams And practical training
18	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	S.I. engine combustion chamber designs	Lectures and practical training	Oral exams And practical training
19	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Carburetion in S. I. Engine	Lectures and practical training	Oral exams And practical training
20	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Simple carburetor – calculation of the Air-fuel nation for a simple carburetor	Lectures and practical training	Oral exams And practical training

21	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Injection fuel systems in S.I. engine	Lectures and practical training	Oral exams And practical training
22	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Combustion in C. I engines , stages of combustion in C.I. engine , variable affecting , stages of combustion	Lectures and practical training	Oral exams And practical training
23	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Diesel knock methods of controlling diesel knock	Lectures and practical training	Oral exams And practical training
24	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	C. I. Engine combustion chamber designs	Lectures and practical training	Oral exams And practical training
25	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Fuel injection in C. I. Engine requirements of diesel injection system , types of injection systems , types of fuel injectors and nozzles	Lectures and practical training	Oral exams And practical training
26	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Fuel , specification , fuels for S. I. Engines , Octane number requirement , additives , fuels for C. I. Engine Octane number additives	Lectures and practical training	Oral exams And practical training
27	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Effect of supercharging on performance of the engine supercharging types	Lectures and practical training	Oral exams And practical training
28	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Engine friction and lubrication , additives	Lectures and practical training	Oral exams And practical training
29	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Pollutants from S. I. Engine , effect of engine maintenance on exhaust emissions , emissions control	Lectures and practical training	Oral exams And practical training
30	theoretical=2 practical=2	Teaching the student the basic concepts of automobile mechanics and how to solve problems	Diesel emissions , diesel smoke and its control comparison diesel and gasoline emissions	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Internal combustion engines book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	Industrial drawing				
2. Course Code:	ID				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	practical study				
6. Number of Credit Hours (Total) / Number of Units (Total) : <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Sarah Salim Hasan Email: <a href="mailto:sara.hassan.iba101@atu.edu.iq">sara.hassan.iba101@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives		Teaching the student to perform engineering drawing using the AutoCAD program			
9. Teaching and Learning Strategies					
Strategy	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	General review of first grade topics, geometric lines, projections, sections, setting dimensions using AutoCAD.	Lectures and practical training	Oral exams And practical training
3-2	Practical=3	Teaching the student to perform engineering	Methods of connection using screws, types of screws, types of nuts, with a drawing of a board.	Lectures and	Oral exams

		drawing using the AutoCAD program		practical training	And practical training
5-4	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Connecting by bolts, their types, their uses, drawing an assembly plate	Lectures and practical training	Oral exams And practical training
7-6	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Connecting by welding, welding symbols, drawing an assembly plate with welding symbols	Lectures and practical training	Oral exams And practical training
9-8	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Connecting by rivets, shapes of rivets, types of connecting by rivets, drawing an assembly plate	Lectures and practical training	Oral exams And practical training
10	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Application plate for disassembling and assembling a mechanical lever	Lectures and practical training	Oral exams And practical training
11	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Springs, their types, their uses, drawing a plate for a compression spring	Lectures and practical training	Oral exams And practical training
12	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing an application plate for disassembling and assembling an exhaust valve	Lectures and practical training	Oral exams And practical training
13	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Column connections (couplers) their types, drawing an application plate	Lectures and practical training	Oral exams And practical training
14	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Clutches, their types and uses, with drawing an application plate	Lectures and practical training	Oral exams And practical training
15	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Bearing chairs Drawing an assembly plate for a friction load chair	Lectures and practical training	Oral exams And practical training
16	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Pulleys and belts (Pulley & Belts) their types and uses with drawing two plates for assembling parts containing belt wheels of different types	Lectures and practical training	Oral exams And practical training
18-17	Practical=3	Teaching the student to perform engineering	Gears (Gears) their types, Spur gears basic definitions, drawing	Lectures and	Oral exams

		drawing using the AutoCAD program	an equal gear with an assembly plate for engaging the equal gear	practical training	And practical training
20-19	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Bevel gears (Bevel gears) Basic definitions with a drawing of an assembly board for the bevel gear	Lectures and practical training	Oral exams And practical training
22-21	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Introduction to Autodesk Inventor	Lectures and practical training	Oral exams And practical training
23	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	2D drawing environment – Environment	Lectures and practical training	Oral exams And practical training
24-25	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Assembly environment	Lectures and practical training	Oral exams And practical training
26-27	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Dynamic analysis and movement environment	Lectures and practical training	Oral exams And practical training
28	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Feature and enhancement	Lectures and practical training	Oral exams And practical training
30-29	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	A project within the jurisdiction of the relevant department for a part of any practical system	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed  
1- 15 marks for practical. for the first semester  
2- 15 marks for practical. for the second semester  
3 - 10 marks for student activities  
4 - 60 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering drawing book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	Car maintenance2				
2. Course Code	CM2				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>240 Hours / 16 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Laith Salim Kamal					
Email: <a href="mailto:Layth.kamal@atu.edu.iq">Layth.kamal@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives		Teaching the student about car breakdowns and how to maintain them			
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Clutch, types of single and multi-disc clutches, clutch components (friction disc - pressure disc - release seat) clutch troubles, diagnostic and maintenance methods	Lectures and practical training	Oral exams And practical training
3-4-5	Theoretical=2 Practical=6	Teaching the student about car breakdowns	The transmission group, the importance of the transmission	Lectures and	Oral exams And practical training

		and how to maintain them	group, the parts of the transmission group and the harmonic slip - the harmonic device, the troubles of the transmission group and methods of detecting and maintaining them	practical training	
6-7-8-9	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Autonomous transmission group, fluid delivery system, torque converter, installation of the autonomous transmission group, how it works, control system of the autonomous transmission group, group malfunctions and methods for detecting and maintaining them.	Lectures and practical training	Oral exams And practical training
10	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Drive shaft, its types (hollow and solid, universal joints, their installation and operation, drive shaft problems, methods of detecting and maintaining them, four-wheel drive cars and four-wheel drive cars 4matic	Lectures and practical training	Oral exams And practical training
11-12	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	The rear axle, an explanation of its various parts, how it works, its malfunctions, and methods of detecting and maintaining it	Lectures and practical training	Oral exams And practical training
13-14	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Suspension, its types (independent and non-independent), complete suspension, independence, the idea of electronically controlled hydraulic suspension.	Lectures and practical training	Oral exams And practical training
15	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Drive train, group components, types of steering boxes	Lectures and practical training	Oral exams And practical training
16	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Drive train problems and ways to detect and maintain them	Lectures and practical training	Oral exams And practical training
17-18	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Hydraulic drive group (types), how it works, hydraulic drive group problems, and methods of detecting and maintaining them	Lectures and practical training	Oral exams And practical training
19	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Types of springs (leaf and spiral), columns that deter shocks, problems with springs, and methods of detecting and maintaining them.	Lectures and practical training	Oral exams And practical training
20	Theoretical=2 Practical=6	Teaching the student about car breakdowns	Wheel angles	Lectures and	Oral exams And practical

		and how to maintain them		practical training	training
21-22	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Parking, types of parking (disc, drum, hydraulic and pneumatic), the idea of auxiliary systems ABS, anti-lock system, anti-slip system during acceleration (ASD), automatic distance maintenance system Distomatic	Lectures and practical training	Oral exams And practical training
23-24	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Suspension, its types (independent and non-independent), complete suspension, independence, the idea of electronically controlled hydraulic suspension.	Lectures and practical training	Oral exams And practical training
25	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Drive train, group components, types of steering boxes	Lectures and practical training	Oral exams And practical training
26	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Drive train problems and ways to detect and maintain them	Lectures and practical training	Oral exams And practical training
27-28	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Hydraulic drive group (types), how it works, hydraulic drive group problems, and methods of detecting and maintaining them	Lectures and practical training	Oral exams And practical training
29-30	Theoretical=2 Practical=6	Teaching the student about car breakdowns and how to maintain them	Types of springs (leaf and spiral), columns that deter shocks, problems with springs, and methods of detecting and maintaining them.	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

- 1- 10 marks for the first theoretical semester and 10 marks for practical.
- 2- 10 marks for the second semester, theoretical + 10 marks for practical
- 3 - 10 marks for student activities
- 4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Modern car maintenance book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	<b>Cars Electricity (2)</b>				
2. Course Code:	<b>CE2</b>				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total) :	<b>90 Hours / 6 Units</b>				
7. Course administrator's name (mention all, if more than one name)					
Name: Inas Jabbar Mohammed					
Email: <a href="mailto:inasalrubaiy1973@gmail.com">inasalrubaiy1973@gmail.com</a>					
8. Course Objectives					
Course Objectives	Teaching the student the basic concepts of car electricals				
9. Teaching and Learning Strategies					
Strategy	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2-1	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Charging circuit (direct current, generator, regulator), parts of the generator and its working principle	Lectures and practical training	Oral exams And practical training
3	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Maintaining the generator and diagnosing its faults (DC) using a special testing device	Lectures and practical training	Oral exams And practical training
4	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	The direct current regulator, its parts, its operation, and diagnosing its malfunctions	Lectures and practical training	Oral exams And practical training
5	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Alternating current (AC) generator, its parts, and its operation	Lectures and practical training	Oral exams And practical training
6	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Malfunctions in the charging circuit of the alternating current generator, methods of diagnosing and repairing them,	Lectures and practical training	Oral exams And practical training

			and explaining the differences between direct and alternating current generators.		
7	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Alternating current regulator and its different types	Lectures and practical training	Oral exams And practical training
8	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Winding wires for the armature	Lectures and practical training	Oral exams And practical training
9-10	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Regular ignition system (battery - main switch - ignition coil - spark distributor - spark plugs - connection wires)	Lectures and practical training	Oral exams And practical training
11-12	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Service and maintenance of the ignition system (checking the ignition coil - condenser - spark distributor - adjusting the ignition)	Lectures and practical training	Oral exams And practical training
13	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Use an oscilloscope to check the ignition system	Lectures and practical training	Oral exams And practical training
14	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Testing device (current and voltage regulator)	Lectures and practical training	Oral exams And practical training
15	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Using a modern electrical device to check the validity of the distributor (Distributor tester).	Lectures and practical training	Oral exams And practical training
16	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Use of the modern spark timing device, its applications and spark tuning	Lectures and practical training	Oral exams And practical training
17	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Using an infra-red exhaust emission tester to analyze the exhaust, determine the validity of spark plugs, and find system faults.	Lectures and practical training	Oral exams And practical training
18-19	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Electronic ignition system	Lectures and practical training	Oral exams And practical training
20	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Lighting system (side, main and interior)	Lectures and practical training	Oral exams And practical training
21	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Side signal cutting device - electronic lighting clip -	Lectures and practical training	Oral exams And practical training

			windshield wiper device - electric fuel pump		
22	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Malfunctions of the front, rear, and side lighting system and interior lights	Lectures and practical training	Oral exams And practical training
23-24	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Auxiliary electrical devices in the car (fuel gauge - oil pressure gauge - temperature gauge - charging current gauge)	Lectures and practical training	Oral exams And practical training
25-26	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Secondary electrical circuits in the car (alarm circuits - side and quad signal circuits - windshield wiper circuits - radio tape recorder circuits)	Lectures and practical training	Oral exams And practical training
27	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	The electrical circuit to control car doors and windows	Lectures and practical training	Oral exams And practical training
28	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Car air conditioning and heating devices (electrical system)	Lectures and practical training	Oral exams And practical training
29	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Car alarm and electronic control system	Lectures and practical training	Oral exams And practical training
30	theoretical=1 Practical=2	Teaching the student the basic concepts of car electrical	Using an oscilloscope to check the operation of a car's engine with a screen and its electrical system, and using a calculator for the test.	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Automotive Electrical Systematic Book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals,  
reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	<b>Modern Car Technology</b>				
2. Course Code:	<b>MC</b>				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Laith Salim Kamal Email: <a href="mailto:Layth.kamal@atu.edu.iq">Layth.kamal@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives	<b>Introducing the student to the modern systems found in modern cars - their operation - their advantages - their malfunctions</b>				
9. Teaching and Learning Strategies					
Strategy	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2-1	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Review of modern car system inspection devices and learn about inspection methods that keep pace with the progress in car technology	Lectures and practical training	Oral exams And practical training
5-3	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Electronic control system for opening and closing engine valves	Lectures and practical training	Oral exams And practical training
7-6	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Electronic control system for transmission control module	Lectures and practical training	Oral exams And practical training
10-8	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Electronic control system for anti-lock braking system ABS-ECU and collision prevention system-Discs	Lectures and practical training	Oral exams And practical training

			brake pad damage sensing system		
11	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Car traction control system	Lectures and practical training	Oral exams And practical training
13-12	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Car stability control system automatic stability control unit	Lectures and practical training	Oral exams And practical training
14	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Cruise control system	Lectures and practical training	Oral exams And practical training
15	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Power assisted steering control unit	Lectures and practical training	Oral exams And practical training
17-16	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Smart suspension system	Lectures and practical training	Oral exams And practical training
18	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	-Car navigation system auto navigation system	Lectures and practical training	Oral exams And practical training
19	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Central body control unit	Lectures and practical training	Oral exams And practical training
20	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Airbag system	Lectures and practical training	Oral exams And practical training
22-21	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Modern exhaust systems and catalyst technology	Lectures and practical training	Oral exams And practical training
25-23	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Hybrid car technology and fuel cell uses	Lectures and practical training	Oral exams And practical training
26	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Smart lamp systems-Tire pressure measurement system	Lectures and practical training	Oral exams And practical training
27	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Various sensor systems (dead angle-wrong overtaking-etc.)	Lectures and practical training	Oral exams And practical training
28	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Automatic parking system	Lectures and practical training	Oral exams And practical training
30-29	Theoretical=1 practical =2	The student learns the modern systems found in modern cars	Review of the latest developments in modern car technology	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed  
1- 10 marks for the first theoretical semester and 10 marks for practical.  
2- 10 marks for the second semester, theoretical + 10 marks for practical  
3 - 10 marks for student activities  
4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Car modern systems book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	Car body				
2. Course Code:	C B				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and partial study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Ahmed Hadi Hatif Email: <a href="mailto:ahmed.shuber@gmail.com">ahmed.shuber@gmail.com</a>					
8. Course Objectives					
Course Objectives			Teaching the student the basic concepts of mechanical work, material properties, and problem solving		
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	An overview of the development of the automobile industry	Lectures and practical training	Oral exams And practical training
2	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	An overview of the manufacture of the car body and structure, building the body and learning about the different designs of car bodies and bodies.	Lectures and practical training	Oral exams And practical training
4-3	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Engineering materials used in the manufacture of the car body and body, ferrous materials, non-ferrous materials (types and specifications(	Lectures and practical training	Oral exams And practical training

5	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Properties of engineering materials (physical properties, mechanical properties, brittleness, mechanical tests)	Lectures and practical training	Oral exams And practical training
6	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Stress and simple motion	Lectures and practical training	Oral exams And practical training
7	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Direct or vertical stress, direct strain	Lectures and practical training	Oral exams And practical training
8	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Elastic materials - Hooke's law	Lectures and practical training	Oral exams And practical training
9	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Modulus of elasticity - Young's modulus	Lectures and practical training	Oral exams And practical training
10	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Tensile test (stress-strain diagram)	Lectures and practical training	Oral exams And practical training
11	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Relatively simple transformation problems	Lectures and practical training	Oral exams And practical training
12	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Arc welding, arc initiation and arc re-initiation	Lectures and practical training	Oral exams And practical training
13	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Electrical resistance welding - spot welding	Lectures and practical training	Oral exams And practical training
15-14	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Gas welding - heating sources - oxy equipment Acetylene - Oxy torch Acetylene - Types of torches	Lectures and practical training	Oral exams And practical training
16	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Fastening with rivets, types of fastening (combinations, combinations), finding the tensile force in the rivet, solved problems	Lectures and practical training	Oral exams And practical training
17	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Comparison between welding and riveting (advantages and disadvantages)	Lectures and practical training	Oral exams And practical training
19-18	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Robot, the advantages of robot over humans and its various uses in the automobile industry	Lectures and practical training	Oral exams And practical training
21-20	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Forming, cold forging and forging processes, types, hot forging and forging processes, types	Lectures and practical training	Oral exams And practical training

22	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Study the designs of the vehicle structure	Lectures and practical training	Oral exams And practical training
23	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Corrosion and the effect of weather and other factors on the car body	Lectures and practical training	Oral exams And practical training
24	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Painting the car, preparing the body and parts to be painted, and cleaning them ,include removing corroded and damaged parts.	Lectures and practical training	Oral exams And practical training
25	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Phosphorescent ,basic dye, putty and polishing works	Lectures and practical training	Oral exams And practical training
26	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Basic dyes, their types, methods of mixing colors, matching colors (according to the tables(	Lectures and practical training	Oral exams And practical training
27	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Dyeing method in production laboratories	Lectures and practical training	Oral exams And practical training
28	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Final polishing and finishing operations	Lectures and practical training	Oral exams And practical training
29	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Paint problems, their diagnosis, treatment methods, and causes	Lectures and practical training	Oral exams And practical training
30	Theoretical=1 practical =2	Learn about the different designs of car bodies and structures	Auto glass, types, repairs and installation of front, rear and side glass	Lectures and practical training	Oral exams And practical training

### 11.Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12.Learning and Teaching Resources

Required textbooks (curricular books, if any)

Car parts book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Academic program description

<b>1. Academic Department</b>	<b>Power Mechanics Technology Department</b>
<b>2. Name of Academic or Professional Program</b>	<b>Spinning and Textiling Branch</b>
<b>3. Date of Preparation of this Description</b>	<b>8 / 12 /2024</b>
<b>4. Name of Final Certificate</b>	<b>Technical Diploma</b>
<b>5. Academic System</b>	<b>Annual</b>
<b>6. Accredited Accreditation Program</b>	<b>ABET</b>
<b>7. Other External Influences</b>	<b>Textile companies - private sector</b>

### **1. Program Vision**

The Department of Power Mechanics is one of the main technological departments. The department is moving towards expanding the base of technical education and its modern applications to be a leader in providing certified technical services and a spirit of competition and cooperation with the community.

### **2. Program Mission**

The Department of Power Mechanics adopts a general message based in its general form on the framework of technical education in Iraq, a message that it seeks to achieve every year to highlight the department's distinctive face. The general objectives focus on graduating national technical cadres at the level of technical development to keep pace with rapid global technical developments. The special message includes the following: -

- Using computer and Internet technologies in education and training
- Activating the relationship with the private sector in the fields of training
- Following up on the development of curricula and training plans and then updating laboratories and workshops
- Interacting with the market and the needs of society in rehabilitation and training

### **3. Program Objectives**

Branch Objective: The program aims to prepare specialized cadres in the field of spinning and weaving who are able to:

1. Operate and maintain spinning and weaving machines.
2. Prepare textile designs.
3. Work on knitting machines
4. Computer drawing skills
5. Work on the computer.

### **4. Program Accreditation**

No

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

No , there is no donor

<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>23</b>	<b>64</b>	<b>%35</b>	All courses are core and there are no electives
<b>College Requirements</b>	<b>23</b>	<b>64</b>	<b>%35</b>	All courses are core and there are no electives
<b>Department Requirements</b>	<b>21</b>	<b>61</b>	<b>%33</b>	All courses are core and there are no electives
<b>Summer Training</b>	/	/	/	All courses are core and there are no electives
<b>Other</b>	/	/	/	/

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

<b>7. Program Description</b>				
<b>Year/Level</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Credit Hours</b>	
			<b>Theoretical</b>	<b>Practical</b>
<b>1</b>	<b>Sp</b>	Spinning technique	3	4
	<b>TF</b>	Textile fibers	2	2
	<b>MA</b>	mathematics	2	-
	<b>CA</b>	Computer applications	1	2
	<b>EM</b>	Engineering mechanics	2	1
	<b>ML</b>	Mechanics lab	-	4
	<b>ED</b>	Engineering Drawing	-	3
	<b>RD</b>	Rights and democracy	2	-
	<b>EL</b>	English language	1	-
	<b>AL</b>	Arabic language	1	-
<b>2</b>	<b>TS</b>	Textile structures	2	3
	<b>TM</b>	Techniques and maintenance of textile machines	3	4
	<b>KT</b>	Knitting technique	1	2
	<b>QC</b>	Quality control	1	2
	<b>ET</b>	Electrical technology	1	2
	<b>IM</b>	Industrial management	2	-
	<b>ID</b>	Industrial drawing	-	3
	<b>CA</b>	Computer applications	1	2
	<b>P</b>	Project	2	-
	<b>EL</b>	English language	1	-
	<b>AL</b>	Arabic language	1	-
	<b>BC</b>	Baath crimes	1	-

## 8. Expected learning outcomes of the program

### Knowledge

1- Training and teaching the student on calculations of mixtures and their prices on spinning machines 2- Maintenance of spinning machines 3- Machine calculations and productivity	<ul style="list-style-type: none"> <li>• Become able to identify faults</li> <li>• Keep up with the developments in technology</li> <li>• Use the calculator with high professionalism</li> </ul>
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### Skills

Spinning Machine Operation Spinning Machine Maintenance	<ul style="list-style-type: none"> <li>• Be able to repair machines</li> <li>• Maintain machines with high skill</li> </ul>
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### Ethics

1- Written lectures. 2- Practical training.	<ul style="list-style-type: none"> <li>• He can take the exam</li> <li>• He applies what he has studied</li> </ul>
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## 9. Teaching and Learning Strategies

1. Written lectures.
2. Practical training.
3. Videos using the data viewer.
4. Scientific visits

## 10. Evaluation methods

1. Continuous testing.
2. Pre and post questions.
3. Semester and final exams.

## 11. Faculty

### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Assistant Professor	Mechanical engineering	thermal combustion systems		1	
Lecture	Electrical power engineering	Electrical power engineering		1	
Lecture	Mechanical engineering	Refractory specialty		1	
Lecture	Mechanical engineering	Engineering education technology		1	
Lecture	Mechanical engineering	Specialization in applied mechanics		2	
Lecture	Materials engineering	Ceramic engineering and building materials		1	
Lecture	Materials engineering	Ceramic engineering		1	
Lecture	Master's degree in Physics	Physics		1	

Lecture assistant	Electrical power engineering	Electrical power engineering		1	
Lecture assistant	Mechanical engineering	Mechanical automation I		1	
Lecture assistant	math Science	Dynamic topology		1	

### **Professional Development**

#### **Mentoring new faculty members**

The head of the department received the new appointees, welcomed them, and directed them to their workplaces in the department, each according to their specialization and academic achievement, so that they could perform the work assigned to them in the best way, for the purpose of continuing the scientific and educational process and directing it in the correct manner in a way that serves the interest of the department and the institution in general.

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

- 1- Teamwork within the group effectively and actively
- 2- Manage time effectively and set priorities with the ability to work on regular schedules
- 3- Leadership and the ability to direct and motivate others
- 4- independence at work.

### **12. Acceptance Criterion**

- 1- Iraqi nationality
- 2- Possession of an Iraqi preparatory school certificate supported by certification from the General Directorate of Education in the governorate or an equivalent certificate.
- 3- The student must be born in 1994 onwards.
- 4- Successful in the medical examination according to the conditions for each study, and the blind student (who meets the conditions for applying for appropriate humanitarian studies) will be submitted through central admission.
- 5- Devoted to study. It is not permissible to combine work and study (at the same time) in colleges and morning institutes. This includes employees of all government institutions. In order for them to continue studying, they must obtain a study leave from their departments starting in accordance with the instructions in force. It is not permissible to combine two studies either, and in the event of a dispute being proven. He writes to the Ministry to cancel his acceptance (the student employee can postpone his studies according to the instructions in order to fulfill the condition of completing two years of service - satisfactory to be entitled to obtain study leave and in accordance with the instructions for granting study leave).
- 6- Among my graduates:
  - A- The current academic year.
  - B- The previous academic year of those who are not centrally accepted into any college or institute, and they are accepted according to the minimum limits for the year of their graduation, and if it is proven that  
The student's acceptance into any college or institute will be returned to his original acceptance and it will be considered a year of failure for him.
- 7- Non-Iraqi students who hold an Iraqi preparatory certificate and are accepted centrally will be notified in writing to review the Central Admissions Department / Expatriates Division to state their exemption or demands for tuition fees in foreign currency according to the controls in Chapter Seven.

### **13. The most important sources of information about the program**

1. Methodical books.
2. Lectures.
3. Internet

### **14. Program Development Plan**

1. Holding scientific seminars
2. Holding internal courses
3. Participation in external courses.

## Program Skills Outline

				Required program Learning outcomes											
Year/ Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
<b>1</b>	Sp	Spinning technique	Basic	*				*				*			
	TF	Textile fibers	Basic	*				*				*			
	MA	Mathematics	Assistant	*				*				*			
	CA	Computer applications	Assistant	*				*				*			
	EM	Engineering mechanics	Basic	*				*				*			
	ML	Mechanics lab	Basic	*				*				*			
	ED	Engineering Drawing	Basic	*				*				*			
	RD	Rights and democracy	Assistant	*				*				*			
	EL	English language	Assistant	*				*				*			
	AL	Arabic language	Assistant	*				*				*			
<b>2</b>	TM	Techniques and maintenance of textile machines	Basic	*				*				*			
	KT	Knitting technique	Basic	*				*				*			

TS	Textile structures	Basic	*				*				*			
QC	Quality control	Basic	*				*				*			
ET	Electrical technology	Basic	*				*				*			
IM	Industrial management	Assistant	*				*				*			
ID	Industrial drawing	Assistant	*				*				*			
CA	Computer applications	Assistant	*				*				*			
P	Project	Basic	*				*				*			
EL	English language	Assistant	*				*				*			
BC	Baath crimes	Assistant	*				*				*			
AL	Arabic language	Assistant	*				*				*			

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

**Stage 1:-****Course Description Form**

1. Course Name:		<b>Spinning technology</b>			
2. Course Code:		S.T			
3. Semester / Year:		First Stage / Annual Course			
4. Description Preparation Date:		<b>8 / 12 /2024</b>			
5. Available Attendance Forms:		Theoretical and practical study			
6. Number of Credit Hours (Total) / Number of Units (Total): <b>210 Hours / 14 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Ansam Ali Hashim Email: <a href="mailto:ansamly2@atu.edu.iq">ansamly2@atu.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		<b>Learn about the technology of converting textile fibers into yarn and learn about the machines</b>			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=3 Practical=4	technology of converting textile fibers	Properties of textile materials needed to be suitable for spinning and weaving	Lectures and practical training	Oral exams And practical training
2	theoretical=3 Practical=4	technology of converting textile fibers	Cotton ginning - its definition - its purpose - types of machines - cylindrical ginning - saw ginning - the effect of the ginning process on the mechanical properties of cotton	Lectures and practical training	Oral exams And practical training
3	theoretical=3 Practical=4	technology of converting textile fibers	Mixing and brightening cotton - its purpose - machines - mixing calculations - mixing methods - manual method - mechanical method - modern methods - comparison between different types	Lectures and practical training	Oral exams And practical training
4	theoretical=3 Practical=4	technology of converting textile fibers	Finding the average unit price of a mixture of different cottons with similar prices - applied examples	Lectures and practical training	Oral exams And practical training

5	theoretical=3 Practical=4	technology of converting textile fibers	Types of rackets - their definition - use - comparison between different types	Lectures and practical training	Oral exams And practical training
6	theoretical=3 Practical=4	technology of converting textile fibers	The carding process - its definition - its purpose - explanation of the path of the hairs in it - the forces affecting the hairs - calculations	Lectures and practical training	Oral exams And practical training
7	theoretical=3 Practical=4	technology of converting textile fibers	Calculations of mechanical drag and real drag - comparing them - calculating total drag - determining exhaust rates - calculating productivity	Lectures and practical training	Oral exams And practical training
8	theoretical=3 Practical=4	technology of converting textile fibers	The withdrawal process - its definition - its purpose - the theory of withdrawal -	Lectures and practical training	Oral exams And practical training
9	theoretical=3 Practical=4	technology of converting textile fibers	Calculating the different speeds of the drawing machine - modern drawing methods - drawing calculations - productivity	Lectures and practical training	Oral exams And practical training
10	theoretical=3 Practical=4	technology of converting textile fibers	The carding process - its definition - its purpose - features - determinants - the relationship of carding to the type of thread - carding theory	Lectures and practical training	Oral exams And practical training
11	theoretical=3 Practical=4	technology of converting textile fibers	Carding preparations - their purpose - stages of preparation - tape winding machine - its calculations - tape assembly and its calculations	Lectures and practical training	Oral exams And practical training
12	theoretical=3 Practical=4	technology of converting textile fibers	Calculating the exhaust ratio - Types of carding according to the exhaust ratio - Drag and coil weight calculations, output and productivity	Lectures and practical training	Oral exams And practical training
13	theoretical=3 Practical=4	technology of converting textile fibers	Calculations of the number of ribbons and yarn - their types - the direct method - the indirect method - the number of cotton yarn - the number of threads for different yarns	Lectures and practical training	Oral exams And practical training
14	theoretical=3 Practical=4	technology of converting textile fibers	Tiger calculations for different threads - applied examples	Lectures and practical training	Oral exams And practical training
15	theoretical=3 Practical=4	technology of converting textile fibers	Additional examples of tigris	Lectures and practical training	Oral exams And practical training
16	theoretical=3 Practical=4	technology of converting textile fibers	The twisting process - its definition - its purpose - explanation of the twisting theory	Lectures and practical training	Oral exams And practical training
17	theoretical=3 Practical=4	technology of converting textile fibers	A detailed explanation of the twist - calculations - the number of twists in ang - the number of twists in a meter - the relationship of the twist factor to the number - production calculations	Lectures and practical training	Oral exams And practical training
18	theoretical=3 Practical=4	technology of converting textile fibers	The spinning process - definition - its purpose - spinning , methods - spinning in the s direction and in the z direction	Lectures and practical training	Oral exams And practical training
19	theoretical=3 Practical=4	technology of converting textile fibers	The ring spinning method - its definition - its advantages – its disadvantages - speed and production calculations - cape	Lectures and	Oral exams And practical training

			spinning - its definition - its advantages - its disadvantages	practical training	
20	theoretical=3 Practical=4	technology of converting textile fibers	Flyer spinning method - definition - parts - advantages and disadvantages and production calculations	Lectures and practical training	Oral exams And practical training
21	theoretical=3 Practical=4	technology of converting textile fibers	Open End Spinning-Definition-Detailed Explanation- Advantages and Disadvantages	Lectures and practical training	Oral exams And practical training
22	theoretical=3 Practical=4	technology of converting textile fibers	Speed and production calculations for the open-end machine	Lectures and practical training	Oral exams And practical training
23	theoretical=3 Practical=4	technology of converting textile fibers	Thread duplication - definition - purpose - theory and calculations	Lectures and practical training	Oral exams And practical training
24	theoretical=3 Practical=4	technology of converting textile fibers	Wool spinning - preparation stages - washing - drying – removing suspended plant materials - mixing wool	Lectures and practical training	Oral exams And practical training
25	theoretical=3 Practical=4	technology of converting textile fibers	A general introduction to wool fibers - wool tops and their features - methods of production	Lectures and practical training	Oral exams And practical training
26	theoretical=3 Practical=4	technology of converting textile fibers	Production of wool yarn - the English method - the French method - the conical drawing method	Lectures and practical training	Oral exams And practical training
27	theoretical=3 Practical=4	technology of converting textile fibers	Anglo drawing method - wool spinning machines - their purpose - main parts	Lectures and practical training	Oral exams And practical training
28	theoretical=3 Practical=4	technology of converting textile fibers	Flyer spinning for wool. A detailed explanation of the machine and its calculations – Sulfameol	Lectures and practical training	Oral exams And practical training
29	theoretical=3 Practical=4	technology of converting textile fibers	spinning machine Advantages and disadvantages of the sulfamyl machine - the cape machine for wool spinning - its parts, advantages and disadvantages	Lectures and practical training	Oral exams And practical training
30	theoretical=3 Practical=4	technology of converting textile fibers	A detailed explanation of the cap machine, its parts, calculations, , advantages and disadvantages	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Spinning technique book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	<b>Textile fibers</b>
2. Course Code:	T.F
3. Semester / Year:	First Stage / Annual Course
4. Description Preparation Date:	<b>8 / 12 /2024</b>
5. Available Attendance Forms:	Theoretical and practical study
6. Number of Credit Hours (Total) / Number of Units (Total): <b>120 Hours / 8 Units</b>	

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

Name: Zahra Kazem Rawdan

Email: [zahraakaz78@atu.edu.iq](mailto:zahraakaz78@atu.edu.iq)

8. Course Objectives

Course Objectives

Course objectives: Teach the student about textile fibers, examinations and uses

9. Teaching and Learning Strategies

Strategy

- 1-Reciprocal Teaching strategy
- 2- Educational bag
- 3- Discussion strategy
- 4- E-learning strategy
- 5- E-learning strategy

### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Definition of agent components – general aspect-agent components classification	Lectures and practical training	Oral exams And practical training
2	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Inspection of cotton fibers	Lectures and practical training	Oral exams And practical training
3	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating the cotton fibers by oxidizing in cold and hot state and study the effects of them on fibers	Lectures and practical training	Oral exams And practical training
4	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating the cotton fibers by acids in cold and hot state and study the effects of them on fibers	Lectures and practical training	Oral exams And practical training
5	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Microscopic study for fiber testing – effect offer of acids and bases on jute fibers	Lectures and practical training	Oral exams And practical training

6	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Effect of acids on linen fibers	Lectures and practical training	Oral exams And practical training
7	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating the linen fibers by caustic in cold and hot state and study the effects of them on fibers	Lectures and practical training	Oral exams And practical training
8	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Microscopic structure of linen and sisal	Lectures and practical training	Oral exams And practical training
9	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Sorting of animal fibers methods	Lectures and practical training	Oral exams And practical training
10	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Microscopic structure	Lectures and practical training	Oral exams And practical training
11	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Chlorination of wool	Lectures and practical training	Oral exams And practical training
12	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Testing the natural properties of wool	Lectures and practical training	Oral exams And practical training
13	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Study the effect of temp. and moisture on wool fibers	Lectures and practical training	Oral exams And practical training
14	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Effect of acids and alkali on wool fibers	Lectures and practical training	Oral exams And practical training
15	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Microscopic structure of silk and mohair	Lectures and practical training	Oral exams And practical training
16	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Study the physical properties of asbestos	Lectures and practical training	Oral exams And practical training
17	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Definition of manmade fibers	Lectures and practical training	Oral exams And practical training
18	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Using combing method to determine the effective length of fibers	Lectures and practical training	Oral exams And practical training
19	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating the linen fibers by acid in cold and hot state and study the effects of them on fibers	Lectures and practical training	Oral exams And practical training
20	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating the jute fibers by acids in cold and hot state and study the effects of them on fibers	Lectures and practical training	Oral exams And practical training

21	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating the wool fibers by acids in cold and hot state and study the effects of them on fibers	Lectures and practical training	Oral exams And practical training
22	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating the wool fibers by alkalis in cold and hot state and study the effects of them on fibers	Lectures and practical training	Oral exams And practical training
23	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating the natural silk fibers by alkalis in cold and hot state and study the effects of them on fibers	Lectures and practical training	Oral exams And practical training
24	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Study the physical properties of some manmade fibers	Lectures and practical training	Oral exams And practical training
25	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Study the microscopic properties of glass fibers	Lectures and practical training	Oral exams And practical training
26	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Poly amide testing in microscope-treating them in acids	Lectures and practical training	Oral exams And practical training
27	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Microscopic test of poly acrylic	Lectures and practical training	Oral exams And practical training
28	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Treating poly acrylic by alkalis	Lectures and practical training	Oral exams And practical training
29	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Using projector device for testing manmade fibers	Lectures and practical training	Oral exams And practical training
30	theoretical=2 Practical=2	Teach the student About textile fibers, examinations and uses	Using tensile test device- maintenance and perpetuation of devises	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed  
1- 10 marks for the first theoretical semester and 10 marks for practical.  
2- 10 marks for the second semester, theoretical + 10 marks for practical  
3 - 10 marks for student activities  
4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Textile fibers book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	Engineering Drawing				
2. Course Code:	ED				
3. Semester / Year:	First Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	practical study				
6. Number of Credit Hours (Total) / Number of Units (Total) : <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Bashar Daa Hussein Email: <a href="mailto:bashar.hussein@atu.edu.iq">bashar.hussein@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives		Teaching the student to perform engineering drawing using the AutoCAD program			
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	The importance of engineering drawing - The importance of using a computer to implement engineering drawing - Drawing board sizes (standard) - An overview of the AutoCAD program	Lectures and practical training	Oral exams And practical training
2	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Types of lines in engineering drawing - using drop-downs for lines and texts	Lectures and practical training	Oral exams And practical training

3-4	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Basic shapes	Lectures and practical training	Oral exams And practical training
5-6	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing adjustments - Drawing aids	Lectures and practical training	Oral exams And practical training
7-8-9	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Engineering operations - dimensioning - applications to previous concepts	Lectures and practical training	Oral exams And practical training
10-11-12-13	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Perspective Drawing - Drawing a perspective containing a circle, rectangle, triangle and polygon	Lectures and practical training	Oral exams And practical training
14-15	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Projection theory - drawing simple projections	Lectures and practical training	Oral exams And practical training
16-17	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Placing dimensions on perspective and projections	Lectures and practical training	Oral exams And practical training
18-19-20	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Conclusion of the third site from two sites	Lectures and practical training	Oral exams And practical training
21-22-23	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Cutting theory - shapes of cutting lines according to the material - drawing cut sections	Lectures and practical training	Oral exams And practical training
24-25-26	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing projections cut from a specific projection	Lectures and practical training	Oral exams And practical training
28-27	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing partially cut projections	Lectures and practical training	Oral exams And practical training
30-29	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Applications and projects	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed  
1- 15 marks for practical. for the first semester  
2- 15 marks for practical. for the second semester  
3 - 10 marks for student activities  
4 - 60 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering drawing book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

**Stage 2 :-****Course Description Form**

1. Course Name :	<b>Textile structures</b>				
2. Course Code:	T.S				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total):	<b>150 Hours / 10 Units</b>				
7. Course administrator's name (mention all, if more than one name)	Name: Hussan Hatem Jasim Email: <a href="mailto:hussain.jasim.iku@atu.edu.iq">hussain.jasim.iku@atu.edu.iq</a>				
8. Course Objectives	Course Objectives Teach the student how to prepare histological structures				
9. Teaching and Learning Strategies	Strategy 1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Classification of woven fabrics	Lectures and practical training	Oral exams And practical training
2	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Standard weaves-plain weaves-drawing repeat derivative –types	Lectures and practical training	Oral exams And practical training
3	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Effect of color (plain in warp and weft)and in both direction	Lectures and practical training	Oral exams And practical training

4	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Twill weaves –how to draw-repeat-types-extension	Lectures and practical training	Oral exams And practical training
5	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Angles of twill weaves	Lectures and practical training	Oral exams And practical training
6	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Non-standard twill shades-broken-compound-mixed and cork screw twill	Lectures and practical training	Oral exams And practical training
7	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Effect of color in warp and weft .	Lectures and practical training	Oral exams And practical training
8	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Sateen weaves-how to draw—repeat-types	Lectures and practical training	Oral exams And practical training
9	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Drawing in types –harness	Lectures and practical training	Oral exams And practical training
10	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Honeycomb weaves –how to draw-repeat types	Lectures and practical training	Oral exams And practical training
11	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Figuring with extra threads (weft) one color	Lectures and practical training	Oral exams And practical training
12	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Traditional weft figuring one and two colors	Lectures and practical training	Oral exams And practical training
13	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Extra warp figuring one and two colors	Lectures and practical training	Oral exams And practical training
14	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Traditional warp figuring one and two color	Lectures and practical training	Oral exams And practical training
15	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Packed clothes –weft packed clothes	Lectures and practical training	Oral exams And practical training
16	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Packed clothes –warp packed clothes	Lectures and practical training	Oral exams And practical training
17	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Bad ford cords from weft by warp direction	Lectures and practical training	Oral exams And practical training
18	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Bolymita weaves by one color in face	Lectures and practical training	Oral exams And practical training
19	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Bolymita weaves by two colors in face	Lectures and practical training	Oral exams And practical training
20	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Pile fabrics in warp and weft pile fabrics	Lectures and practical training	Oral exams And practical training
21	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Multi-layer fabrics –double cloth when use plain 2/2	Lectures and practical training	Oral exams And practical training
22	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Multi-layer fabrics –double cloth when use plain 2/2	Lectures and practical training	Oral exams And practical training

23	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Multi-layer fabrics –double cloth when use plain 1/1	Lectures and practical training	Oral exams And practical training
24	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Gauze weaves types	Lectures and practical training	Oral exams And practical training
25	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Straight gauze and reversed gauze	Lectures and practical training	Oral exams And practical training
26	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Mock leno weaves perforated fabrics	Lectures and practical training	Oral exams And practical training
27	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Analysis of textile plain	Lectures and practical training	Oral exams And practical training
28	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Analysis of textile twill	Lectures and practical training	Oral exams And practical training
29	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Analysis of textile sateen	Lectures and practical training	Oral exams And practical training
30	theoretical=2 Practical=3	Teach the student how to prepare histological structures	Analysis of textile (review)	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

- 1- 10 marks for the first theoretical semester and 10 marks for practical.
- 2- 10 marks for the second semester, theoretical + 10 marks for practical
- 3 - 10 marks for student activities
- 4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Textile fibers book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	<b>Industrial drawing</b>				
2. Course Code:	I.D				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Sarah Salim Hasan Email: <a href="mailto:sara.hassan.iba101@atu.edu.iq">sara.hassan.iba101@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives		Teaching the student to perform engineering drawing using the AutoCAD program			
9. Teaching and Learning Strategies					
Strategy	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	General review of first grade topics, geometric lines, projections, sections, setting dimensions using AutoCAD.	Lectures and practical training	Oral exams And practical training
3-2	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Methods of connection using screws, types of screws, types of nuts, with a drawing of a board.	Lectures and practical training	Oral exams And practical training
5-4	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Connecting by bolts, their types, their uses, drawing an assembly plate	Lectures and practical training	Oral exams And practical training

7-6	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Connecting by welding, welding symbols, drawing an assembly plate with welding symbols	Lectures and practical training	Oral exams And practical training
9-8	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Connecting by rivets, shapes of rivets, types of connecting by rivets, drawing an assembly plate	Lectures and practical training	Oral exams And practical training
10	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Application plate for disassembling and assembling a mechanical lever	Lectures and practical training	Oral exams And practical training
11	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Springs, their types, their uses, drawing a plate for a compression spring	Lectures and practical training	Oral exams And practical training
12	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing an application plate for disassembling and assembling an exhaust valve	Lectures and practical training	Oral exams And practical training
13	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Column connections (couplers) their types, drawing an application plate	Lectures and practical training	Oral exams And practical training
14	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Clutches, their types and uses, with drawing an application plate	Lectures and practical training	Oral exams And practical training
15	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Bearing chairs Drawing an assembly plate for a friction load chair	Lectures and practical training	Oral exams And practical training
16	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Pulleys and belts (Pulley & Belts) their types and uses with drawing two plates for assembling parts containing belt wheels of different types	Lectures and practical training	Oral exams And practical training
18-17	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Gears (Gears) their types, Spur gears basic definitions, drawing an equal gear with an assembly plate for engaging the equal gear	Lectures and practical training	Oral exams And practical training
20-19	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Bevel gears (Bevel gears) Basic definitions with a drawing of an assembly board for the bevel gear	Lectures and practical training	Oral exams And practical training
22-21	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Introduction to Autodesk Inventor	Lectures and practical training	Oral exams And practical training

23	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	2D drawing environment – Environment	Lectures and practical training	Oral exams And practical training
24-25	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Assembly environment	Lectures and practical training	Oral exams And practical training
26-27	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Dynamic analysis and movement environment	Lectures and practical training	Oral exams And practical training
28	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Feature and enhancement	Lectures and practical training	Oral exams And practical training
30-29	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	A project within the jurisdiction of the relevant department for a part of any practical system	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

- 1- 15 marks for practical. for the first semester
- 2- 15 marks for practical. for the second semester
- 3 - 10 marks for student activities
- 4 - 60 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering drawing book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	Techniques and maintenance of textile machines				
2. Course Code:	T.M				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>210 Hours / 14 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Alaa Suhal Najim Email: <a href="mailto:Aalasuhal@gmail.com">Aalasuhal@gmail.com</a>					
8. Course Objectives					
Course Objectives	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines				
9. Teaching and Learning Strategies					
Strategy	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	A general diagram of the weaving stages and an explanation of the thread numbering system	Lectures and practical training	Oral exams And practical training
2	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Angled threads with examples, applications, and numbering of angled threads	Lectures and practical training	Oral exams And practical training
3	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Information on the stages of preparation - warp thread preparations	Lectures and practical training	Oral exams And practical training
4	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Recycling stage and productivity calculations	Lectures and practical training	Oral exams And practical training

5	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Direct and indirect blocking - types of holders - main parts of the blocking machine	Lectures and practical training	Oral exams And practical training
6	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Production calculations and creating examples and applications for production processes related to the payment stage	Lectures and practical training	Oral exams And practical training
7	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Installation and machine parts	Lectures and practical training	Oral exams And practical training
8	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Production calculations and creating examples and applications of production processes	Lectures and practical training	Oral exams And practical training
9	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Growing mixtures and determining proportions	Lectures and practical training	Oral exams And practical training
10	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Examples of making mixtures - Calculations of the effect of starching on the properties of yarns and fabrics	Lectures and practical training	Oral exams And practical training
11	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Throwing and throwing - equipment for throwing and throwing - types of throwing and combing equipment	Lectures and practical training	Oral exams And practical training
12	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Weft recycling - pipe recycling machines Production calculations - applied examples of weft turning	Lectures and practical training	Oral exams And practical training
13	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Textile - its definition - general information about it - division of textile machines - main and secondary parts	Lectures and practical training	Oral exams And practical training
14	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Types of textile machines - advantages and disadvantages of each type	Lectures and practical training	Oral exams And practical training
15	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Some calculations related to fabric and production efficiency - mathematical examples of production and weights	Lectures and practical training	Oral exams And practical training
16	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Calculating the machine's production in linear meters - applied examples of calculating weights	Lectures and practical training	Oral exams And practical training
17	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Calculating the coverage factor - the diameter of the thread depending on its number	Lectures and practical training	Oral exams And practical training
18	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	The psyche - internal and external cams - applied examples of - the theory of organizing external cams based on the tissue structure	Lectures and practical training	Oral exams And practical training
19	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Dobby - its types - How to perform some textile structures on the doobby machine	Lectures and practical training	Oral exams And practical training
20	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Aja card - its types and how to implement some textile structures on it - its energy - types of lattices	Lectures and practical training	Oral exams And practical training
21	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	How to make some engravings on the jacquard machine	Lectures and practical training	Oral exams And practical training
22	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Extrusion devices - their types - the shuttle - its definition - identifying single-shuttle and multi-shuttle machines	Lectures and practical training	Oral exams And practical training

23	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Calculating the coverage factor - the diameter of the thread depending on its number	Lectures and practical training	Oral exams And practical training
24	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	The psyche - internal and external cams - applied examples of - the theory of organizing external cams based on the tissue structure	Lectures and practical training	Oral exams And practical training
25	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Dobby - its types - How to perform some textile structures on the doobby machine	Lectures and practical training	Oral exams And practical training
26	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Ajacard - its types and how to implement some textile structures on it - its energy - types of lattices	Lectures and practical training	Oral exams And practical training
27	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	How to make some engravings on the jacquard machine	Lectures and practical training	Oral exams And practical training
28	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Extrusion devices - their types - the shuttle - its definition - identifying single-shuttle and multi-shuttle machines	Lectures and practical training	Oral exams And practical training
29	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	The psyche - internal and external cams - applied examples of - the theory of organizing external cams based on the tissue structure	Lectures and practical training	Oral exams And practical training
30	theoretical=3 Practical=4	Teaching the student about the parts of textile machines, their preparations, production calculations, and maintenance of the machines	Ajacard - its types and how to implement some textile structures on it - its energy - types of lattices	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

- 1- 10 marks for the first theoretical semester and 10 marks for practical.
- 2- 10 marks for the second semester, theoretical + 10 marks for practical
- 3 - 10 marks for student activities
- 4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Machine maintenance book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name :	<b>Knitting technique</b>				
2. Course Code:	k.M				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Alaa Suhal Najim Email: <a href="mailto:Aalasuhal@gmail.com">Aalasuhal@gmail.com</a>					
8. Course Objectives					
Course Objectives		<b>Teaching the student the parts of knitting machines, their production calculations, and maintenance of the machines</b>			
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Introduction to the topic of knitting and the reasons for its spread	Lectures and practical training	Oral exams And practical training
2	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Comparison between woven fabrics and knitted fabrics	Lectures and practical training	Oral exams And practical training
3	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of the main devices in knitting machines (weft knitting) - Study of the types of needles used in knitting machines - their advantages and disadvantages with drawing	Lectures and practical training	Oral exams And practical training
4	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production	Study of the types of platinum and the types of cams used	Lectures and practical training	Oral exams And practical training

		calculations, and maintenance of the machines			
5	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	How to form a knot on hooked needles with a drawing	Lectures and practical training	Oral exams And practical training
6	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of feeding devices for knot formation systems, along with study of tension calculations in yarns according to inactive and active	Lectures and practical training	Oral exams And practical training
7	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of drawing devices in knitting machines and their relationship to fabric specifications	Lectures and practical training	Oral exams And practical training
8	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Classification of types of machines according to the fabrics produced	Lectures and practical training	Oral exams And practical training
9	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Classification of machines according to construction and design	Lectures and practical training	Oral exams And practical training
10	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Identify the types of wefts knitting stitches (plain, hem, straight, crossed, and shifted)	Lectures and practical training	Oral exams And practical training
11	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Studying the properties of plain and hemmed fabrics and comparing the two types	Lectures and practical training	Oral exams And practical training
12	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of derivative and double compositions and the characteristics of these fabrics	Lectures and practical training	Oral exams And practical training
13	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Studying the types of warps knitting stitches and learning how to represent these stitches in analytical drawings and diagrams	Lectures and practical training	Oral exams And practical training
14	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Practical examples of analytical drawing and schematic drawing	Lectures and practical training	Oral exams And practical training
15	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of the main devices in the circular knitting machine, along with a schematic diagram of the machine in general	Lectures and practical training	Oral exams And practical training
16	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Calculating the productivity of the circular machine with schematic examples	Lectures and practical training	Oral exams And practical training
17	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of the main devices in the surface knitting machine with a diagram of the machine in general	Lectures and practical training	Oral exams And practical training
18	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Calculating the productivity of a surface knitting machine with applied examples	Lectures and practical training	Oral exams And practical training
19	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study how knots are formed in the derby machine with a diagram of the machine	Lectures and practical training	Oral exams And practical training
20	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production	Study of the zip lock machine and how to make knots on it	Lectures and practical training	Oral exams And practical training

		calculations, and maintenance of the machines			
21	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of parts for a textile knitting machine	Lectures and practical training	Oral exams And practical training
22	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	A study of the productivity of a textile knitting machine with applied examples	Lectures and practical training	Oral exams And practical training
23	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Studying the foundations upon which quality estimation in woven fabrics depends	Lectures and practical training	Oral exams And practical training
24	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of defects in woven fabrics in general	Lectures and practical training	Oral exams And practical training
25	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of defects in knitted fabrics in circular knitting machines and sock machines	Lectures and practical training	Oral exams And practical training
26	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Study of defects in woven fabrics in textile knitting machines	Lectures and practical training	Oral exams And practical training
27	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Types of threads used in the knitting industry in general	Lectures and practical training	Oral exams And practical training
28	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	The effect of yarn types on the final product	Lectures and practical training	Oral exams And practical training
29	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Calculate the knot length	Lectures and practical training	Oral exams And practical training
30	theoretical=1 Practical=2	Teaching the student, the parts of knitting machines, their production calculations, and maintenance of the machines	Identify the types of oils and greases used to maintain sewing machines	Lectures and practical training	Oral exams And practical training

## 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Machine maintenance book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name	Electrical Technology
2. Course Code:	E. T
3. Semester / Year:	Second Stage / Annual Course
4. Description Preparation Date:	8 / 12 /2024
5. Available Attendance Forms:	Theoretical and practical study
6. Number of Credit Hours (Total) / Number of Units (Total):	<b>90 Hours / 6 Units</b>

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

Name: Inas Jabbar Mohammed  
 Email: [inasalrubaiy1973@gmail.com](mailto:inasalrubaiy1973@gmail.com)

8. Course Objectives

**Course Objectives**      **Teaching the student, the principles of electricity**

9. Teaching and Learning Strategies

<b>Strategy</b>	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy
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### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Electrical units and symbols - components of a simple electrical circuit - Ohm's law	Lectures and practical training	Oral exams and practical training
2	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Connecting resistors in series and parallel - Kirchhoff's laws and their applications	Lectures and practical training	Oral exams and practical training
3	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Single-phase alternating current - its generation, properties and uses.	Lectures and practical training	Oral exams and practical training
4	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Definition of sine wave - waveform with frequency – value	Lectures and practical training	Oral exams and practical training
5	theoretical=1 Practical=2	Teaching the student, the principles of electricity	The effective value of the current and voltage - a comparison between three-phase alternating current and its generation - the phases and their sequence	Lectures and practical training	Oral exams and practical training
6	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Phase angle – representing phases with rotating vectors	Lectures and practical training	Oral exams and practical training
7	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Principles of electromagnetism - definition of magnetic field - lines of force	Lectures and practical training	Oral exams and practical training
8	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Flux and flux density - magnetic field intensity - magnetic effect of electric current - applied issues	Lectures and practical training	Oral exams and practical training
9	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Mutual self-inductance - Henry - Effect of inductance on the sine wave with phase difference	Lectures and practical training	Oral exams and practical training

			calculations - Comparison between electric and magnetic circuits.		
10	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Capacitance - Farad - The effect of capacitance on the sine wave with voltage difference calculations	Lectures and practical training	Oral exams and practical training
11	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Transformers - their types - their working principle - lift transformers	Lectures and practical training	Oral exams and practical training
12	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Conservation and isolation transformers - transformer capacity and capacity estimation	Lectures and practical training	Oral exams and practical training
13	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Three-phase induction motors - their types and working principle	Lectures and practical training	Oral exams and practical training
14	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Engine speed and ways to improve it	Lectures and practical training	Oral exams and practical training
15	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Connecting motors - delta connection - star connection	Lectures and practical training	Oral exams and practical training
16	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Line current in delta and star - the use of star and delta in practical life - speed and voltage in both cases	Lectures and practical training	Oral exams and practical training
17	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Single-phase alternating current motors - working theory and types	Lectures and practical training	Oral exams and practical training
18	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Condenser motor - single-phase motor, working theory and types	Lectures and practical training	Oral exams and practical training
19	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Motor protection - fuses and their types - protection against overload	Lectures and practical training	Oral exams and practical training
20	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Protection against high temperature - thermal cutter - magnetic pick-up cutter	Lectures and practical training	Oral exams and practical training
21	theoretical=1 Practical=2	Teaching the student, the principles of electricity	How to identify faults in engines and how to fix them - the engine does not rotate	Lectures and practical training	Oral exams and practical training
22	theoretical=1 Practical=2	Teaching the student, the principles of electricity	The engine is running at a slower than normal speed - The engine temperature rises while it is running - Dealing with noise in the engines	Lectures and practical training	Oral exams and practical training
23	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Electrical switches, their types and their work	Lectures and practical training	Oral exams and practical training
24	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Microswitch - types of connections to the contact points	Lectures and practical training	Oral exams and practical training
25	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Inductance devices, their types and their working principle	Lectures and practical training	Oral exams and practical training
26	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Time tracker - how it works and how to adjust it	Lectures and practical training	Oral exams and practical training
27	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Photocell and its types	Lectures and practical training	Oral exams and practical training
28	theoretical=1 Practical=2	Teaching the student, the principles of electricity	The principle of cell operation and its applications	Lectures and practical training	Oral exams and practical training
29	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Al-Muwahid - its composition - the principle of its work	Lectures and practical training	Oral exams and practical training
30	theoretical=1 Practical=2	Teaching the student, the principles of electricity	Principle of work of unified	Lectures and practical training	Oral exams and practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Electrical technology book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name	Quality control				
2. Course Code:	Q.C				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Ansam Ali Hashim Email: <a href="mailto:ansamly2@atu.edu.iq">ansamly2@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives			Teach the student the principles of quality control		
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	theoretical=1 Practical=2	Teach the student the principles of quality control	Statistics - its relationship to spinning - calculating the rate - repetition - drawing curves	Lectures and practical training	Oral exams and practical training
2	theoretical=1 Practical=2	Teach the student the principles of quality control	Measures of dispersion - standard deviation - uses of standard deviation	Lectures and practical training	Oral exams and practical training
3	theoretical=1 Practical=2	Teach the student the principles of quality control	control charts and their uses - specification limits	Lectures and practical training	Oral exams and practical training
4	theoretical=1 Practical=2	Teach the student the principles of quality control	Types of maps - average-range - defect analysis	Lectures and practical training	Oral exams and practical training
5	theoretical=1 Practical=2	Teach the student the principles of quality control	Sampling theory - the importance of quality control in industry	Lectures and practical training	Oral exams and practical training
6	theoretical=1 Practical=2	Teach the student the principles of quality control	Defects in lightening - carding - drawing machines and how to identify them	Lectures and practical training	Oral exams and practical training
7	theoretical=1 Practical=2	Teach the student the principles of quality control	Identifying defects in twisting, carding and final spinning machines	Lectures and practical training	Oral exams and practical training

8	theoretical=1 Practical=2	Teach the student the principles of quality control	Tests of thread number and filament length rate	Lectures and practical training	Oral exams and practical training
9	theoretical=1 Practical=2	Teach the student the principles of quality control	Thread twisting tests	Lectures and practical training	Oral exams and practical training
10	theoretical=1 Practical=2	Teach the student the principles of quality control	Thread elongation and regularity tests	Lectures and practical training	Oral exams and practical training
11	theoretical=1 Practical=2	Teach the student the principles of quality control	The relationship between thread strength and shawl strength	Lectures and practical training	Oral exams and practical training
12	theoretical=1 Practical=2	Teach the student the principles of quality control	Physical specifications of the thread	Lectures and practical training	Oral exams and practical training
13	theoretical=1 Practical=2	Teach the student the principles of quality control	The relationship between Tano and elongation of different yarns (artificial - natural)	Lectures and practical training	Oral exams and practical training
14	theoretical=1 Practical=2	Teach the student the principles of quality control	Phenotypic examination of filaments using simple methods	Lectures and practical training	Oral exams and practical training
15	theoretical=1 Practical=2	Teach the student the principles of quality control	Calculating the percentage of knots in the threads	Lectures and practical training	Oral exams and practical training
17-18	theoretical=1 Practical=2	Teach the student the principles of quality control	A detailed explanation of the Aleustar device, its uses and benefits	Lectures and practical training	Oral exams and practical training
19	theoretical=1 Practical=2	Teach the student the principles of quality control	Fabric tests - dimensional shrinkage - effect of moisture	Lectures and practical training	Oral exams and practical training
20	theoretical=1 Practical=2	Teach the student the principles of quality control	Fabric durability - measuring it	Lectures and practical training	Oral exams and practical training
21	theoretical=1 Practical=2	Teach the student the principles of quality control	The ability of the fabric to resist external conditions	Lectures and practical training	Oral exams and practical training
22	theoretical=1 Practical=2	Teach the student the principles of quality control	The ability of the fabric to resist abrasion by friction	Lectures and practical training	Oral exams and practical training
23	theoretical=1 Practical=2	Teach the student the principles of quality control	Carpet test - thickness measurement-	Lectures and practical training	Oral exams and practical training
24	theoretical=1 Practical=2	Teach the student the principles of quality control	Experiments conducted on carpets, such as friction after periods of time	Lectures and practical training	Oral exams and practical training
26	theoretical=1 Practical=2	Teach the student the principles of quality control	Continuation of week 25	Lectures and practical training	Oral exams and practical training
27	theoretical=1 Practical=2	Teach the student the principles of quality control	Studying the effect of treating fabric with different materials	Lectures and practical training	Oral exams and practical training
28	theoretical=1 Practical=2	Teach the student the principles of quality control	Examining fabric compositions and their relationship to machines	Lectures and practical training	Oral exams and practical training
29	theoretical=1 Practical=2	Teach the student the principles of quality control	Longitudinal and transverse defects in the fabric	Lectures and practical training	Oral exams and practical training
30	theoretical=1 Practical=2	Teach the student the principles of quality control	The relationship of the control department with the rest of the departments	Lectures and practical training	Oral exams and practical training

## 11.Course Evaluation

The degree is distributed

- 1- 10 marks for the first theoretical semester and 10 marks for practical.
- 2- 10 marks for the second semester, theoretical + 10 marks for practical
- 3 - 10 marks for student activities
- 4 - 50 marks final exam

## 12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Quality control book and booklets
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Academic program description

<b>1. Academic Department</b>	<b>Power Mechanics Technology Department</b>
<b>2. Name of Academic or Professional Program</b>	<b>Refrigeration and Air Conditioning Branch</b>
<b>3. Date of Preparation of this Description</b>	<b>8 / 12 /2024</b>
<b>4. Name of Final Certificate</b>	<b>Technical Diploma</b>
<b>5. Academic System</b>	<b>Annual</b>
<b>6. Accredited Accreditation Program</b>	<b>ABET</b>
<b>7. Other External Influences</b>	<b>Labor Market, Private Sector and Government</b>

### 1. Program Vision

The Department of Power Mechanics is one of the main technological departments. The department is moving towards expanding the base of technical education and its modern applications to be a leader in providing certified technical services and a spirit of competition and cooperation with the community.

### 2. Program Mission

The Department of Power Mechanics adopts a general message based in its general form on the framework of technical education in Iraq, a message that it seeks to achieve every year to highlight the department's distinctive face. The general objectives focus on graduating national technical cadres at the level of technical development to keep pace with rapid global technical developments. The special message includes the following: -

- Using computer and Internet technologies in education and training
- Activating the relationship with the private sector in the fields of training
- Following up on the development of curricula and training plans and then updating laboratories and workshops
- Interacting with the market and the needs of society in rehabilitation and training

### 3. Program Objectives

**Branch objective:** - Preparing technical cadres in construction and reconstruction projects in the public and private sectors with professionalism in the field of refrigeration and air conditioning and with high dedication. Using computer drawing skills and working on the computer.

### 4. Program Accreditation

No

### 5. Other external influences

No, there is no donor

### 6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	23	64	%35	All courses are core and there are no electives
College Requirements	23	64	%35	All courses are core and there are no electives
Department Requirements	21	61	%33	All courses are core and there are no electives
Summer Training	/	/	/	All courses are core and there are no electives
Other	/	/	/	/

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

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
1	A.C	Air conditioning - cooling	2	2
	FT	Fluids and Thermodynamics	2	1
	MA	Mathematics	2	-
	RD	Rights and democracy	2	-
	CA	Computer applications	1	2
	ML	Mechanics lab	-	4
	ED	Engineering Drawing	-	3
	EL	English language	1	-
	EM	Engineering mechanics	2	1
	ET	Electrical technology	1	-
AL	Arabic language	1	-	
2	AC	Air conditioner	2	2
	AS	Refrigeration Systems	2	2
	HT	Heat transfer	2	1
	CD	Control systems devices	2	1
	RCM	Refrigeration and air conditioning equipment maintenance	2	4
	DRC	Drawing of refrigeration and air conditioning systems	0	3
	CA	Computer applications	1	2
	P	project	2	-
	IM	Industrial management	2	-
	BC	Baath crimes	1	-
	EL	English language	1	-
	AL	Arabic language	1	-

### 8. Expected learning outcomes of the program

#### Knowledge

1- Identify the parts of the cooling devices and how each one works. 2- Identify faults. 3- Use modern devices. 4- General knowledge of computers.	<ul style="list-style-type: none"> <li>• Become able to identify faults</li> <li>• Keep up with the developments in technology</li> <li>• Use the calculator with high professionalism</li> </ul>
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1- Operation and maintenance of devices. 2- Determine faults, choose oils and maintenance.	<ul style="list-style-type: none"> <li>• Be able to repair refrigeration equipment</li> </ul> <p>Maintain equipment with high skill</p>
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#### Ethics

Creating a useful person	Work on modern devices.
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## 11. Faculty

### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Assistant Professor	Mechanical engineering	thermal combustion systems		1	
Lecture	Electrical power engineering	Electrical power engineering		1	
Lecture	Mechanical engineering	Refractory specialty		1	
Lecture	Mechanical engineering	Engineering education technology		1	
Lecture	Mechanical engineering	Specialization in applied mechanics		2	
Lecture	Materials engineering	Ceramic engineering and building materials		1	
Lecture	Materials engineering	Ceramic engineering		1	
Lecture	Master's degree in Physics	Physics		1	
Lecture assistant	Electrical power engineering	Electrical power engineering		1	
Lecture assistant	Mechanical engineering	Mechanical automation1		1	
Lecture assistant	Math Science	Dynamic topology		1	

### Professional Development

#### Mentoring new faculty members

The head of the department received the new appointees, welcomed them, and directed them to their workplaces in the department, each according to their specialization and academic achievement, so that they could perform the work assigned to them in the best way, for the purpose of continuing the scientific and educational process and directing it in the correct manner in a way that serves the interest of the department and the institution in general.

#### Professional development of faculty members

- 1- Teamwork within the group effectively and actively
- 2- Manage time effectively and set priorities with the ability to work on regular schedules
- 3- Leadership and the ability to direct and motivate others
- 4- independence at work.

## 9. Teaching and Learning Strategies

1. Written lectures.
2. Practical training.
3. Videos using the data viewer.
4. Scientific visits

### 10. Evaluation methods

1. Continuous testing.
2. Pre and post questions.
3. Semester and final exams.

## 12. Acceptance Criterion

- 1- Iraqi nationality
- 2- Possession of an Iraqi preparatory school certificate supported by certification from the General Directorate of Education in the governorate or an equivalent certificate.
- 3- The student must be born in 1994 onwards.
- 4- Successful in the medical examination according to the conditions for each study, and the blind student (who meets the conditions for applying for appropriate humanitarian studies) will be submitted through central admission.
- 5- Devoted to study. It is not permissible to combine work and study (at the same time) in colleges and morning institutes. This includes employees of all government institutions. In order for them to continue studying, they must obtain a study leave from their departments starting in accordance with the instructions in force. It is not permissible to combine two studies either, and in the event of a dispute being proven. He writes to the Ministry to cancel his acceptance (the student employee can postpone his studies according to the instructions in order to fulfill the condition of completing two years of service - satisfactory to be entitled to obtain study leave and in accordance with the instructions for granting study leave).
- 6- Among my graduates:
  - A- The current academic year.
  - B- The previous academic year of those who are not centrally accepted into any college or institute, and they are accepted according to the minimum limits for the year of their graduation, and if it is proven that The student's acceptance into any college or institute will be returned to his original acceptance and it will be considered a year of failure for him.
- 7- Non-Iraqi students who hold an Iraqi preparatory certificate and are accepted centrally will be notified in writing to review the Central Admissions Department / Expatriates Division to state their exemption or demands for tuition fees in foreign currency according to the controls in Chapter Seven.

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

1. Methodical books.
2. Lectures.
3. Internet

## 14. Program Development Plan

1. Holding scientific seminars
2. Holding internal courses
3. Participation in external courses.

## Program Skills Outline

				Required program Learning outcomes											
Year/ Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
<b>1</b>	A.C	Air conditioning - cooling	Basic	*				*				*			
	FT	Fluids and Thermodynamics	Basic	*				*				*			
	ET	Electrical technology	Basic	*				*				*			
	MA	Mathematics	Assistant	*				*				*			
	RD	Rights and democracy	Assistant	*				*				*			
	CA	Computer applications	Assistant	*				*				*			
	ML	Mechanics lab	Basic	*				*				*			
	ED	Engineering Drawing	Basic	*				*				*			
	EM	Engineering mechanics	Basic	*				*				*			
	EL	English language	Assistant	*				*				*			
AL	Arabic language	Assistant	*				*				*				
<b>2</b>	AC	Air conditioner	Basic	*				*				*			
	AS	Refrigeration Systems	Basic	*				*				*			

<b>CD</b>	<b>Control systems devices</b>	Basic	*				*				*			
<b>IM</b>	<b>Industrial management</b>	Assistant	*				*				*			
<b>BC</b>	<b>Baath crimes</b>	Assistant	*				*				*			
<b>DRC</b>	<b>Drawing of refrigeration and air conditioning systems</b>	Assistant	*				*				*			
<b>CA</b>	<b>Computer applications</b>	Assistant												
<b>P</b>	<b>project</b>	Basic	*				*				*			
<b>AL</b>	<b>Arabic language</b>	Assistant	*				*				*			
<b>RCM</b>	<b>Refrigeration and air conditioning equipment maintenance</b>	Basic	*				*				*			

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

**Stage 1 :-****Course Description Form**

1. Course Name:		<b>Thermodynamics</b>			
2. Course Code:		T			
3. Semester / Year:		First Stage / Annual Course			
4. Description Preparation Date:		8 / 12 /2024			
5. Available Attendance Forms:		Theoretical and practical study			
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Zahraa Kazem Rodhan Email: <a href="mailto:zahraakaz78@atu.edu.iq">zahraakaz78@atu.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		Teaching the student basic principles of thermodynamic ,first law ,and second law of thermodynamic			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-6	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Thermodynamic term- measuring devices- properties- state – process- cycles –density and specific volume – the pressure (gage, vacuum, and absolute)- temperature relations (Celsius, Kelvin and ranking scale)- energy- renewable energy-resources (solar energy, wind energy, energy of water falling, tidal energy)- hydrocarbons source (oil & gas)-form of energy used in thermodynamic-	Lectures and practical training	Oral exams And practical training

			potential energy-kinetic energy-heat-work. Internal energy-flow work.		
7-8	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	First law of thermodynamics-flow system-nun flow system –steady –un steady –open –closed. examples.	Lectures and practical training	Oral exams And practical training
9 – 10 - 11	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Applications of the first law on nozzle, diffuser, condenser, evaporator, compressor, heat exchanger (surface, open), turbine, boiler. examples.	Lectures and practical training	Oral exams And practical training
12 - 13	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Thermodynamic process undergoing at constant (pressure, volume, temperature, enthalpy)- polytropic process- with representation on a(P-V), (T-S) &(P-H) diagram.	Lectures and practical training	Oral exams And practical training
14	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Specific heat, kind of specific heat-gas constant.	Lectures and practical training	Oral exams And practical training
15	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	The second law of thermodynamics, statement of the second law, heat engine, heat pump.	Lectures and practical training	Oral exams And practical training
16 – 17	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Carnot power cycle- reversed Carnot cycle (refrigeration & heat pump applications). Examples.	Lectures and practical training	Oral exams And practical training
18 -19	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Study of steam. Steam properties- using steam tables.	Lectures and practical training	Oral exams And practical training
20	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Calculations of the properties for (liquid-vapor) mixture (wet steam).	Lectures and practical training	Oral exams And practical training
21 -22	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Steam process under going at constant (pressure, volume)-isentropic process, adiabatic process & applications.	Lectures and practical training	Oral exams And practical training
23 -24	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	The Rankine cycle, processes of the cycle, examples	Lectures and practical training	Oral exams And practical training
25	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	The vapor Compression cycle.	Lectures and practical training	Oral exams And practical training
26 -27- 28	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Fuel –definition of accounts and properties of the fuel used in boilers and cooling systems absorbance.	Lectures and practical training	Oral exams And practical training
29 -30	theoretical=2 Practical=1	the student's information about basic principles of thermodynamic	Boiler – types – characteristics.	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

- 1- 10 marks for the first theoretical semester and 10 marks for practical.
- 2- 10 marks for the second semester, theoretical + 10 marks for practical
- 3 - 10 marks for student activities
- 4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Fluids book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	<b>Engineering Drawing</b>				
2. Course Code:	ED				
3. Semester / Year:	First Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	practical study				
6. Number of Credit Hours (Total) / Number of Units (Total) : <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Alaa Shaker Aobida Email: <a href="mailto:alaashaker2025@gmail.com">alaashaker2025@gmail.com</a>					
8. Course Objectives					
Course Objectives			Teaching the student to perform engineering drawing using the AutoCAD program		
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	The importance of engineering drawing - The importance of using a computer to implement engineering drawing - Drawing board sizes (standard) - An overview of the AutoCAD program	Lectures and practical training	Oral exams And practical training
2	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Types of lines in engineering drawing - using drop-downs for lines and texts	Lectures and practical training	Oral exams And practical training
3-4	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Basic shapes	Lectures and practical training	Oral exams And practical training

5-6	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing adjustments - Drawing aids	Lectures and practical training	Oral exams And practical training
7-8-9	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Engineering operations - dimensioning - applications to previous concepts	Lectures and practical training	Oral exams And practical training
10-11-12-13	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Perspective Drawing - Drawing a perspective containing a circle, rectangle, triangle and polygon	Lectures and practical training	Oral exams And practical training
14-15	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Projection theory - drawing simple projections	Lectures and practical training	Oral exams And practical training
16-17	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Placing dimensions on perspective and projections	Lectures and practical training	Oral exams And practical training
18-19-20	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Conclusion of the third site from two sites	Lectures and practical training	Oral exams And practical training
21-22-23	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Cutting theory - shapes of cutting lines according to the material - drawing cut sections	Lectures and practical training	Oral exams And practical training
24-25-26	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing projections cut from a specific projection	Lectures and practical training	Oral exams And practical training
28-27	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Drawing partially cut projections	Lectures and practical training	Oral exams And practical training
30-29	Practical=3	Teaching the student to perform engineering drawing using the AutoCAD program	Applications and projects	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Engineering drawing book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	Principles of Refrigeration				
2. Course Code:	R.A				
3. Semester / Year:	First Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>120 Hours / 8 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Hussein Hatem Jasim Email: <a href="mailto:hussain.jasim.iku@atu.edu.iq">hussain.jasim.iku@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives	the student's information about basic principles of thermodynamic ,first law ,and second law of thermodynamic ,deep study for Carnot power cycle and reverse				
9. Teaching and Learning Strategies					
Strategy	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	theoretical=2 Practical=2	The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure	Principles of thermodynamics, property, state, Temp. (dry and wet), pressure (Abs., gas, atm.), sp. volume, sp. humidity, Rel. humidity, heat (sense and lat.), dew-point, air conditioning, refrigeration, Ton and refrigeration, refrigeration types, element and equipment for property measurements.	Lectures and practical training	Oral exams And practical training
3	theoretical=2 Practical=2	The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure	Air properties, Dalton laws, psychrometric properties calculations, sp. humidity, REL humidity, enthalpy, pressure and Temp.	Lectures and practical training	Oral exams And practical training
4	theoretical=2 Practical=2	The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure	Psychrometric chart.	Lectures and practical training	Oral exams And practical training

5-6	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Psychometric chart using, for mixing process, Sen. Heating and cooling, lat. Heating and cooling, humidification and dehumidification, steam injection.	Lectures and practical training	Oral exams And practical training
7-8	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Actual air conditioning process, air- mixing and cooling with dehumidification with and without re heat coils, humidification of air and heating with reheat coils.	Lectures and practical training	Oral exams And practical training
9-10	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Sensible heat factor, by- bass factor, contact factor, humidification efficiency, thermal comfort requirements in space.	Lectures and practical training	Oral exams And practical training
11	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Principle of refrigeration, method of heat transfer, sp. heat, pressure and critical pressure, temp. and critical temp., phase change	Lectures and practical training	Oral exams And practical training
12-14	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Refrigeration method, natural and industrial system, vapor- compression system, absorption system, steam- jet system, thermo electric system, liquefaction of gases system, air- system in air- craft and others	Lectures and practical training	Oral exams And practical training
15	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Pressure –enthalpy chart, for common refrigerant	Lectures and practical training	Oral exams And practical training
16-17	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Vapor-compression system, theoretical calculation (heat added, heat rejected, work compressor, cop., quantity of refrigerant)	Lectures and practical training	Oral exams And practical training
18-19	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Actual vapor compression system, the effect of vapor super-heated in suction line, sub-cooled in liquid line, pressure drop (pressure losses and heat exchanger on c.o.p.	Lectures and practical training	Oral exams And practical training
20-22	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Compressor, classification, working principles, types, (reciprocating, rotary, center fugal, screw, and another types), construction, secondary types, type of refrigerant using, advantage and disadvantage for each type.	Lectures and practical training	Oral exams And practical training
23-24	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Condensers and cooling tower, classification condenser (air- cooled, water cooled, evaporative), advantages and disadvantages for each type, classification of cooling tower.	Lectures and practical training	Oral exams And practical training
25-26	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Expansion devices types, (manual device, automatic valve, thermostatic valve, low and high side float valve, capillary tubes, advantages and disadvantages for each type.	Lectures and practical training	Oral exams And practical training
27-28	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Evaporators types- (natural and forced convection), (floated and dry expansion) advantages and disadvantages for each type.	Lectures and practical training	Oral exams And practical training
29-30	theoretical=2 Practical=2	<b>The student intraduct to the basic procedures for air conditioning buildings and calculating the capacity and efficiency of each procedure</b>	Refrigerant, classification, (main and secondary) required prosperities, selection of refrigerant.	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Fluids book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name	Electrical Technology				
2. Course Code:	E. T				
3. Semester / Year:	First Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>120 Hours / 8 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Zena Salah Hassan Email: <a href="mailto:zena@atu.edu.iq">zena@atu.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		<b>The course aims to provide the student with the scientific and practical foundations of electrical and machinery technology, which he will actually use when practicing his speciality.</b>			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Introduction to electron technology, definitions, amperes, current, voltage, resistance, ohms.	Lectures and practical training	Oral exams and practical training
2	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Electronic parallelism and energy, mutual circuit, mixed circuit	Lectures and practical training	Oral exams and practical training
3	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Electronic parallelism and energy, mutual circuit, mixed circuit	Lectures and practical training	Oral exams and practical training
4	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Kirchhoff's Law, ohms, applications	Lectures and practical training	Oral exams and practical training
5	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Kirchhoff's Law, ohms, applications	Lectures and practical training	Oral exams and practical training

6	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Principles of electronic magnets, magnetic field, magnetic force, magnetic density.	Lectures and practical training	Oral exams and practical training
7	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Electronic magnetism	Lectures and practical training	Oral exams and practical training
8	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Alternating current, alternating current generation and voltage characteristics, EMF, EMI wave formation, example.	Lectures and practical training	Oral exams and practical training
9	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Alternating current, alternating current generation and voltage characteristics, EMF, EMI wave formation, example.	Lectures and practical training	Oral exams and practical training
10	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Single-phase alternating current resistance circuit, coil circuit, capacitor circuit, phase diagram, phase angle.	Lectures and practical training	Oral exams and practical training
11	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Resistance file of circuit contents, capacitors connected in series, power calculations, power factor, modified power methods, trend diagrams.	Lectures and practical training	Oral exams and practical training
12	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Resistance file of circuit contents, capacitors connected in series, power calculations, power factor, modified power methods, trend diagrams.	Lectures and practical training	Oral exams and practical training
13	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Three-phase alternating current, generation, wiring and connection methods, star, delta, voltage lines, current lines, phase diagrams, current, voltage and power.	Lectures and practical training	Oral exams and practical training
14	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Three-phase alternating current, generation, wiring and connection methods, star, delta, voltage lines, current lines, phase diagrams, current, voltage and power.	Lectures and practical training	Oral exams and practical training
15	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Electrical transformer, methods and types of work, construction, applications, losses in the transformer, transformer testing, transformer efficiency, automatic transformer	Lectures and practical training	Oral exams and practical training
16	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Electrical transformer, methods and types of work, construction, applications, losses in the transformer, transformer testing, transformer efficiency, automatic transformer	Lectures and practical training	Oral exams and practical training
17	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Distribution of electronic energy (voltage law).	Lectures and practical training	Oral exams and practical training
18	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Converting solar energy into electricity.	Lectures and practical training	Oral exams and practical training
19	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	DC motors, their components, working principles, types of applications, types of starting, losses, power calculations	Lectures and practical training	Oral exams and practical training
20	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	DC motors, their components, working principles, types of applications, types of starting, losses, power calculations	Lectures and practical training	Oral exams and practical training
21	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Alternating current motors, their components, working principles, types of applications, single phase - three phases, types of starting, speed control.	Lectures and practical training	Oral exams and practical training

22	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Motor protection, current protection devices, overload, temperature, surge protection	Lectures and practical training	Oral exams and practical training
23	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Engine testing, engine maintenance and parts repair	Lectures and practical training	Oral exams and practical training
24	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Introduction to electron technology, definitions, amperes, current, voltage, resistance, ohms.	Lectures and practical training	Oral exams and practical training
25	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Electronic parallelism and energy, mutual circuit, mixed circuit	Lectures and practical training	Oral exams and practical training
26	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Electronic parallelism and energy, mutual circuit, mixed circuit	Lectures and practical training	Oral exams and practical training
27	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Kirchhoff's Law, ohms, applications	Lectures and practical training	Oral exams and practical training
28	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Kirchhoff's Law, ohms, applications	Lectures and practical training	Oral exams and practical training
29	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Principles of electronic magnets, magnetic field, magnetic force, magnetic density.	Lectures and practical training	Oral exams and practical training
30	Theoretical=2 Practical=2	provide the student with the scientific and practical foundations of electrical and machine	Electronic magnetism	Lectures and practical training	Oral exams and practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Electricity technology book
Main references (sources)	Currently available methodical book
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

**Stage 2: -****Course Description Form**

1. Course Name:		<b>Drawing of refrigeration and conditioning systems</b>			
2. Course Code: :		D.R			
3. Semester / Year:		Second Stage / Annual Course			
4. Description Preparation Date:		<b>8 / 12 /2024</b>			
5. Available Attendance Forms:		Practical study			
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Hameeda Muslim Abd- alhussein Email: <a href="mailto:hameedahmuslim@gmail.com">hameedahmuslim@gmail.com</a>					
8. Course Objectives					
Course Objectives		Provide the student with experience and skills to enable him to read and draw architectural plans and air duct maps			
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Practical=3	Provide the student with experience and skills to enable him	Drawing an architectural plan for a multi-story building	Lectures and practical training	Oral exams And practical training
2	Practical=3	Provide the student with experience and skills to enable him	A general idea of drawing air ducts in the single line style	Lectures and practical training	Oral exams And practical training
3	Practical=3	Provide the student with experience and skills to enable him	Draw an air duct with two lines indicating the dimensions	Lectures and practical training	Oral exams And practical training
4-5	Practical=3	Provide the student with experience and skills to enable him	Draw a complete air duct diagram (containing bend, T-branch, and other	Lectures and practical training	Oral exams And practical training

			connections) with the dimensions indicated on it		
6	Practical=3	Provide the student with experience and skills to enable him	Draw complete ductwork diagram with connection to hoist device or air exchange unit	Lectures and practical training	Oral exams And practical training
7	Practical=3	Provide the student with experience and skills to enable him	Drawing a complete diagram of the air ducts with details of the drawing of the windows and air distributors... in their locations, with dimensions and air quantities indicated on them.	Lectures and practical training	Oral exams And practical training
8-9	Practical=3	Provide the student with experience and skills to enable him	A general idea of drawing water pipes for air conditioning units (cooling water system - heating water system - condensing water system)	Lectures and practical training	Oral exams And practical training
10-11	Practical=3	Provide the student with experience and skills to enable him	Drawing paintings for the coil and fan duct network with single - double - triple - quadruple doors	Lectures and practical training	Oral exams And practical training
12	Practical=3	Provide the student with experience and skills to enable him	Drawing of the double riser tube within an integrated cooling system	Lectures and practical training	Oral exams And practical training
13	Practical=3	Provide the student with experience and skills to enable him	Drawing a diagram of an integrated pipeline network, including control and measuring devices	Lectures and practical training	Oral exams And practical training
14	Practical=3	Provide the student with experience and skills to enable him	Machine room layout drawing (single line and two piping lines)	Lectures and practical training	Oral exams And practical training
15	Practical=3	Provide the student with experience and skills to enable him	Drawing sections of the machine room to illustrate the movement of the pipe within the space of the room	Lectures and practical training	Oral exams And practical training
16	Practical=3	Provide the student with experience and skills to enable him	Drawing an architectural map of a single floor - showing how to connect the coil and fan units	Lectures and practical training	Oral exams And practical training
17	Practical=3	Provide the student with experience and skills to enable him	Draw a diagram of the cooling water pipes connecting the machine room to the engine room on a specific floor	Lectures and practical training	Oral exams And practical training
18-19	Practical=3	Provide the student with experience and skills to enable him	A three-dimensional drawing of the cooling, condensing and charging water system with valves and control devices installed	Lectures and practical training	Oral exams And practical training
20-21 22-23 24-25	Practical=3	Provide the student with experience and skills to enable him	Drawing a diagram of the control systems for a condensing unit - air exchanger unit, a home cooling panel... a separate cooling panel	Lectures and practical training	Oral exams And practical training
26-27 28-29- 30	Practical=3	Provide the student with experience and skills to enable him	Drawing supports and pipe fasteners, device supports, pump bases - with a scientific visit to one of the buildings to see the implementation of air ducts - and extending the water pipe network.	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 15 marks for practical. for the first semester

2- 15 marks for practical. for the second semester

3 - 10 marks for student activities

4 - 60 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Refrigeration systems drawing book

Main references (sources)

Methodical books related to industrial drawing

Recommended books and references (scientific journals, reports)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	<b>Air-conditioner</b>
2. Course Code: :	AC
3. Semester / Year:	Second Stage / Annual Course
4. Description Preparation Date:	<b>8 / 12 /2024</b>
5. Available Attendance Forms:	Theoretical and practical study

6. Number of Credit Hours (Total) / Number of Units (Total): **120 Hours / 8 Units**

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

Name: Ali Assim Abd Al-Razak

Email: [ali.nit2009@atu.edu.iq](mailto:ali.nit2009@atu.edu.iq)

8. Course Objectives

<b>Course Objectives</b>	Introducing the student to a detailed study of the basics of air conditioning and calculating thermal loads in cooling and heating systems, a study of different air conditioning groups and the basics of designing air ducts and pipes, in addition to the topics of noise and air purification.
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9. Teaching and Learning Strategies

<b>Strategy</b>	<ul style="list-style-type: none"> <li>1-Reciprocal Teaching strategy</li> <li>2- Educational bag</li> <li>3- Discussion strategy</li> <li>4- E-learning strategy</li> <li>5- E-learning strategy</li> </ul>
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Heat transfer – heat transfer by conduction – heat transfer coefficient, heat transfer by convection	Lectures and practical training	Oral exams And practical training
2	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Heat transfer by radiation, heat transfer through walls and composite walls, total Heat transfer coefficient	Lectures and practical training	Oral exams And practical training
3	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Air- condition and feeling comfortable, Air movement, relative humidity wet and bulb temperature	Lectures and practical training	Oral exams And practical training
4	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Heating load, calculation of heating load losses	Lectures and practical training	Oral exams And practical training

5 – 7	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Cooling load Parameters & Calculations	Lectures and practical training	Oral exams And practical training
8	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Heating & Cooling systems	Lectures and practical training	Oral exams And practical training
9	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Psychometric chart, sensible and latent heat, configuration of air leaving the heating & cooling coil	Lectures and practical training	Oral exams And practical training
10	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Computer-aided calculation of cooling load.	Lectures and practical training	Oral exams And practical training
11 – 14	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Air ducting design, Kinds & pressure losses calculation included fittings	Lectures and practical training	Oral exams And practical training
15	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Movement energy, air discharge in rooms	Lectures and practical training	Oral exams And practical training
16 – 17	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Fans, fan laws, specification	Lectures and practical training	Oral exams And practical training
18	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Vibration and vibration sources	Lectures and practical training	Oral exams And practical training
19 – 21	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Piping design, types and Pumps calculation	Lectures and practical training	Oral exams And practical training
22 – 25	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Types of air condoning system & Air and water system	Lectures and practical training	Oral exams And practical training
26 – 27	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Application of air condoning systems in building	Lectures and practical training	Oral exams And practical training
28	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Air filtration methods	Lectures and practical training	Oral exams And practical training
29	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Air Washers	Lectures and practical training	Oral exams And practical training
30	Theoretical=2 Practical=2	Study of the basics of air conditioning and calculating thermal loads in cooling and heating systems,	Energy distribution in air condoning system	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

- 1- 10 marks for the first theoretical semester and 10 marks for practical.
- 2- 10 marks for the second semester, theoretical + 10 marks for practical
- 3 - 10 marks for student activities
- 4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of air conditioning and refrigeration engineering - Khaled Al-Judi
Main references (sources)	Applied Air – conditioning and refrigeration by C.T Gosling
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	Refrigeration Systems				
2. Course Code: :	CS				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>120 Hours / 8 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Hussein Hatem Jasim Email: <a href="mailto:hussain.jasim.iku@atu.edu.iq">hussain.jasim.iku@atu.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		Introducing the student to the systems used in the field of freezing and understanding their theoretical basis... and studying the actual compression system, choosing pipes and balancing parts.			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
(2-1)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Compression refrigeration system (theory and practice) and media quality	Lectures and practical training	Oral exams And practical training
(5-3)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Selection of compression system parts / evaporator - condenser - compressor - condensing unit - group balance	Lectures and practical training	Oral exams And practical training
(8-6)	Theoretical=2 Practical=2	The systems used in the field of freezing and	Complex compression system - multi-compressor {presence of	Lectures and practical training	Oral exams And practical training

		understanding their theoretical basis	interchanger - presence of flash tank } or multi-evaporator		
(10-9)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	General considerations for designing and extending the piping network (drain line - liquid line - suction line - water pipes)	Lectures and practical training	Oral exams And practical training
(14-11)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Compression system accessories / purpose - location	Lectures and practical training	Oral exams And practical training
(16-15)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Control devices used in refrigeration systems	Lectures and practical training	Oral exams And practical training
(20-17)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Absorption refrigeration system / working principle - advantages - use in the field of refrigeration and condensation / comparison with the compression system - use of solar energy for operation	Lectures and practical training	Oral exams And practical training
(22-21)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Vapor jet refrigeration system	Lectures and practical training	Oral exams And practical training
(25-23)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Air refrigeration system - advantages - types	Lectures and practical training	Oral exams And practical training
(27-26)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Air liquefaction refrigeration system . advantages - types	Lectures and practical training	Oral exams And practical training
28	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Thermoelectric refrigeration system	Lectures and practical training	Oral exams And practical training
(30-29)	Theoretical=2 Practical=2	The systems used in the field of freezing and understanding their theoretical basis	Food preservation technology - Cold store designs - Calculating store loads - Types of stores	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of air conditioning and refrigeration engineering - Khaled Al-Judi
Main references (sources)	Applied Air – conditioning and refrigeration by C.T Gosling
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	Heat transfer				
2. Course Code: :	HT				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Asraa Adnan Nagem Email: <a href="mailto:asraa@atu.edu.iq">asraa@atu.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>	The aim of studying heat transfer is to enable the student to know the main general foundations of heat transfer and its practical applications in the field of air conditioning, such as finding the thermal load of a building, as well as finding the thermal conductivity, thickness and type of insulation used in air conditioning system pipes and heat exchangers of all types and their uses in cooling.				
9. Teaching and Learning Strategies					
<b>Strategy</b>	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Basic principles and importance of heat transfer.	Lectures and Practical training	Oral exams And practical training
2	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	The three kinds of heat transfer , conduction heat transfer, convection heat transfer , radiation heat transfer, examples	Lectures and Practical training	Oral exams And practical training
3	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Conduction of heat transfer in the steady state conduction through a homogeneous plans wall	Lectures and Practical training	Oral exams And practical training
4	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Conduction through a composite plans wall, heat resistance . conduction through a homogeneous cylinder wall	Lectures and Practical training	Oral exams And practical training

5	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Conduction through a composite cylinder wall , influence of variable conductivity , examples	Lectures and Practical training	Oral exams And practical training
6	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat transfer by convection , Reynolds concept of similarity of the flow of fluids and the viscosity , the most important dimensionless groups, examples	Lectures and Practical training	Oral exams And practical training
7	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat transfer by free convection , heat transfer from vertical and horizontal surfaces , examples	Lectures and Practical training	Oral exams And practical training
8-9	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat transfer by free convection from horizontal square plates , heat transfer proportion of air at atmospheric pressure and properties of water . examples	Lectures and Practical training	Oral exams And practical training
10	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat transfer by forced convection , the heating of fluids in turbulent flow through pipes , examples	Lectures and Practical training	Oral exams And practical training
11	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	The heating of fluids flowing normal to single wires and tubes the heating of fluids flowing normal to tube banks , examples	Lectures and Practical training	Oral exams And practical training
12-13	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat transfer by the combined effect of conduction and convection, heat transfer between two fluids through a plane wall, heat transfer between two fluids through a cylinder wall, examples	Lectures and Practical training	Oral exams And practical training
14-15	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Types of heat exchangers, the log mean temperature difference, examples	Lectures and Practical training	Oral exams And practical training
16-17	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat exchanger effectiveness ratio , examples	Lectures and Practical training	Oral exams And practical training
18	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat transfer through fins , condensation and boiling heat transfer	Lectures and Practical training	Oral exams And practical training
19	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat transfer by radiation , the concept of a perfect black body	Lectures and Practical training	Oral exams And practical training
20	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Stefan – Boltzmann’s law of total radiation , general equation for heat exchange by radiation between black surfaces , examples	Lectures and Practical training	Oral exams And practical training
21-22-23	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat exchange by radiation between large parallel black plane , examples	Lectures and Practical training	Oral exams And practical training
24-25-26	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat exchange by radiation between large parallel planes of different emissivity , examples	Lectures and Practical training	Oral exams And practical training
27-28	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat conduction in series with convection and radiation, examples	Lectures and Practical training	Oral exams And practical training
29	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	Heat transfer through air space , examples	Lectures and Practical training	Oral exams And practical training
30	Theoretical=2 Practical=1	To enable the student to know the main general foundations of heat transfer	General problems , home works	Lectures and Practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed  
1- 10 marks for the first theoretical semester and 10 marks for practical.  
2- 10 marks for the second semester, theoretical + 10 marks for practical  
3 - 10 marks for student activities  
4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Elements of heat transfer, Obert McGraw – Hill – 1984
Main references (sources)	Heat and mass transfer Jakob and Hawking John Wiley & Sons, Inc. 1957
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	Control system devices				
2. Course Code:	CD				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Zeina Salah Hassan Email: <a href="mailto:zena@atu.edu.iq">zena@atu.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>		Introducing the student to the basic principles that operate in control and command systems in general, and specifically those used in the field of controlling the operation of air conditioning and refrigeration systems.			
9. Teaching and Learning Strategies					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Principles of control . and general definitions of the most important terms used in control	Lectures and practical training	Oral exams And practical training
2	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Principles of control - Types of control	Lectures and practical training	Oral exams And practical training
3	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Principles of measurement - measurement - control and measurement - the most important factors subject to control	Lectures and practical training	Oral exams And practical training
4	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Measuring and sensing devices for various factors in refrigeration and air conditioning devices {liquid level - pressure - temperature - humidity}	Lectures and practical training	Oral exams And practical training

5	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Electrical control circuits / electrical control balance - diagrams of electrical circuits and control	Lectures and practical training	Oral exams And practical training
7-6	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Electrical control elements, thermostat - circuit breaker for overload protection, humidity regulators, pressure regulators, final control elements, conductors.	Lectures and practical training	Oral exams And practical training
8	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Electronic control circuits - Control circuit elements, thermostat, humidity regulator	Lectures and practical training	Oral exams And practical training
-11-10-9 12	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Air control circuits, control components, control elements, thermostat, humidity regulator, pressure regulator, control elements, gate motor, air valves, air relays, compressed air preparation equipment	Lectures and practical training	Oral exams And practical training
14-13	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Components of the control system for refrigeration machines - dynamic properties	Lectures and practical training	Oral exams And practical training
-16-15 -18-17 19	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Methods of controlling cooling capacity - Controlling cooling capacity through the operation of the evaporator - Controlling cooling capacity through the operation of centrifugal compressors and controlling cooling capacity using thermal expansion valve, controlling capacity using the float in centrifugal devices	Lectures and practical training	Oral exams And practical training
20	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Practical applications on control devices for clean rooms - white rooms - computer rooms - hospitals	Lectures and practical training	Oral exams And practical training
-22-21 -24-23 26-25	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Control systems for home units - Control circuits for wall air conditioners, home freezers - separate devices, multiple zones (control devices for the device or multiple zones) - central air conditioning device	Lectures and practical training	Oral exams And practical training
27	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Components of the control system for the central cooling system and the most important methods used to control temperature and humidity	Lectures and practical training	Oral exams And practical training
28	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Control system for the air conditioning system that operates throughout the year	Lectures and practical training	Oral exams And practical training
29	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Control system for central heating devices	Lectures and practical training	Oral exams And practical training
30	Theoretical=2 Practical=1	The basic principles that operate in control and command systems	Developing a detailed control map for central cooling and air conditioning devices	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering Measurement & instrumentation by L. F. Adams
Main references (sources)	Control systems for heating & ventilation and air-condition, by Haines
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1. Course Name:	Air conditioning and refrigeration maintenance				
2. Course Code: :	ACR				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>180 Hours / 12 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Ali Assim Abd Al-Razak Email: <a href="mailto:ali.nit2009@atu.edu.iq">ali.nit2009@atu.edu.iq</a>					
8. Course Objectives					
<b>Course Objectives</b>	Teaching the student and providing him with the necessary skills and experience to maintain and operate air conditioning and refrigeration equipment.				
9. Teaching and Learning Strategies					
<b>Strategy</b>	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2 Practical=4	Providing him with the necessary skills	A general idea about refrigeration and air conditioning devices and about device maintenance - and types of maintenance.	Lectures and practical training	Oral exams And practical training
2	Theoretical=2 Practical=4	Providing him with the necessary skills	The mechanical circuit of the compression refrigeration system. Maintenance of each part. Expected malfunctions for each part - as well as malfunctions of auxiliary parts.	Lectures and practical training	Oral exams And practical training
3	Theoretical=2 Practical=4	Providing him with the necessary skills	Using the external inspection method - to identify mechanical and electrical faults	Lectures and practical training	Oral exams And practical training
4	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of home refrigeration appliances (refrigerator - freezer - water cooler) Mechanical circuit	Lectures and practical training	Oral exams And practical training
5	Theoretical=2 Practical=4	Providing him with the necessary skills	Study of the electrical circuit - and identification of faults - causes and treatment for the home group	Lectures and practical training	Oral exams And practical training

6	Theoretical=2 Practical=4	Providing him with the necessary skills	Replacement of cycle parts - charging - discharging - adding oil - checking for leakage	Lectures and practical training	Oral exams And practical training
8-7	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of the wall-mounted room air conditioning unit (regular cycle and reverse cycle air conditioning unit) with replacement of parts (mechanical and electrical cycle)	Lectures and practical training	Oral exams And practical training
9	Theoretical=2 Practical=4	Providing him with the necessary skills	Reciprocating compressor - compressor inspection - compressor faults - treatment - compressor parts maintenance - seat replacement - leakage fluids - valve maintenance	Lectures and practical training	Oral exams And practical training
10	Theoretical=2 Practical=4	Providing him with the necessary skills	Car air conditioning unit maintenance - parts description - device operation selection - discharging and charging - parts replacement - faults - treatment	Lectures and practical training	Oral exams And practical training
12-11	Theoretical=2 Practical=4	Providing him with the necessary skills	Separate and integrated air conditioning unit maintenance - device installation - device description - types of air or water-cooled devices . Parts maintenance . Compressor - condenser - evaporator - filter - fans and rotating shafts	Lectures and practical training	Oral exams And practical training
13-14	Theoretical=2 Practical=4	Providing him with the necessary skills	Discharging and charging - oil change - compressor replacement - checking control devices and electrical control panel and fault identification table	Lectures and practical training	Oral exams And practical training
15-16	Theoretical=2 Practical=4	Providing him with the necessary skills	Commercial refrigeration unit maintenance - unit types - unit installation - Unloading, charging and leakage checking - Inspection and replacement of parts	Lectures and practical training	Oral exams And practical training
17	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of central air conditioning unit with reciprocating and centrifugal compressors in the following cases - Two compressors for two separate cycles - With two or more compressors for a combined cycle	Lectures and practical training	Oral exams And practical training
18	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of air exchangers - Fans - Heating and cooling coils - Filters of all kinds.	Lectures and practical training	Oral exams And practical training
19	Theoretical=2 Practical=4	Providing him with the necessary skills	Air mixing box with gates – Humidifier – Electric heater with control valves	Lectures and practical training	Oral exams And practical training
20	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of the coil and fan unit (system description, coil line maintenance and cleaning of coils and filter from dirt left by air on the network)	Lectures and practical training	Oral exams And practical training
21	Theoretical=2 Practical=4	Providing him with the necessary skills	Control group and how to connect it to the electrical control panel	Lectures and practical training	Oral exams And practical training
22	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of central air conditioning unit parts – Checking the compressor oil with maintenance of service valves and washing the condenser with chemicals, cleaning the evaporator, regulating the expansion valve, checking and regulating pressure controllers (high- and low-pressure controller and oil)	Lectures and practical training	Oral exams And practical training
23	Theoretical=2 Practical=4	Providing him with the necessary skills	Replacing device parts – Discharging and charging cycle and checking for leakage (fault identification list)	Lectures and practical training	Oral exams And practical training

24	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of the cooling tower (types) Maintenance of the tower body and basin, float, filling and fan and motor, gearbox (if any), adjusting the alignment of the axles	Lectures and practical training	Oral exams And practical training
25	Theoretical=2 Practical=4	Providing him with the necessary skills	Description of the different types of water pumps, maintenance of the motor and valves	Lectures and practical training	Oral exams And practical training
26	Theoretical=2 Practical=4	Providing him with the necessary skills	Adjusting the alignment of the motor and pump axle – Types of water leakage seal, repair or replacement – Replacing the pump, pipes and accessories	Lectures and practical training	Oral exams And practical training
27	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of electrical parts	Lectures and practical training	Oral exams And practical training
28	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance of the boiler – Cleaning the boiler body from the inside and outside – Dismantling the motor and its accessories and maintenance Its various parts. Reassembling it on the boiler body.	Lectures and practical training	Oral exams And practical training
29	Theoretical=2 Practical=4	Providing him with the necessary skills	Preparing the boiler in terms of preparing water and checking the electrical components, then operating it with re-checking its control systems.	Lectures and practical training	Oral exams And practical training
30	Theoretical=2 Practical=4	Providing him with the necessary skills	Maintenance and reading of electrical panels for central air conditioning units	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering Measurement & instrumentation by L. F. Adams
Main references (sources)	Control systems for heating & ventilation and air-condition , by Haines
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Stage 1 :- For all branches

### Course Description Form

1. Course Name	<b>Computer and Artificial Intelligence</b>				
2. Course Code	<b>A.C</b>				
3. Semester / Year	First Stage / Annual Course				
4. Description Preparation Date	<b>8 / 12 /2024</b>				
5. Available Attendance Forms	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total): <b>60 Hours / 2 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Alaa Hussein Majeed Email: <a href="mailto:alaa.majeed.bib23@atu.edu.iq">alaa.majeed.bib23@atu.edu.iq</a>					
8. Course Objectives					
Course Objectives			Teaching the students about the computer and some applications.		
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=1 Practical=1	Data show, Computer Machine, Screen Show	Computer Definition, Software, Hardware, Computer Generations.	Lectures and practical training	Oral exams And practical training
2	Theoretical=1 Practical=1	Data show, Computer Machine, Screen Show	MS-DOS Operating System,  Definition,  Internal commands , External commands	Lectures and practical training	Oral exams And practical training

3-12	Theoretical=1 Practical=1	Data show, Computer Machine, Screen Show	Internal commands: Dir , Del , Time Date , Cls , RD, CD, MD, Echo, Prompt, Ren < copy , vol, ver , path External Commands: Edit , tree , xcopy , format , chkdsk, diskcopy	Lectures and practical training	Oral exams And practical training
13-27	Theoretical=1 Practical=1	Data show, Computer Machine, Screen Show	Operating System Windows: Desktop, Icons, Taskbar, Start, Shutdown, My computer, Control Panel, Windows media player , Calculator Paint , Note Pad, Help	Lectures and practical training	Oral exams And practical training
28-30	Theoretical=1 Practical=1	Data show, Computer Machine, Screen Show	Computer Viruses, Antivirus.	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Computer and its Applications

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals,  
reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	<b>Mechanics lab</b>				
2. Course Code:	<b>ML</b>				
3. Semester / Year:	First Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms:	practical study				
6. Number of Credit Hours (Total) / Number of Units (Total) : <b>120 Hours / 8 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: - / Email: - /					
8. Course Objectives					
Course Objectives		<b>Gaining manual and craft skills for the student when performing work and manufacturing using various numbers and tools.</b>			
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
3-2-1	Practical=4	Gaining manual and craft skills for the student	Plumbing - The importance of plumbing - Safety precautions in the workshop - Sand - Its types	Lectures and practical training	Oral exams And practical training
6-5-4	Practical=4	Gaining manual and craft skills for the student	Forming the sand mold for a one-piece model - Melting the metal and pouring it into the mold - Molds for a two-piece model or more with assembling the cast models	Lectures and practical training	Oral exams And practical training
9-8-7	Practical=4	Gaining manual and craft skills for the student	Other types such as the rotating one - the fixed mold	Lectures and practical training	Oral exams And practical training
-11-10 12	Practical=4	Gaining manual and craft skills for the student	Studying castings to identify defects and know their causes	Lectures and practical training	Oral exams And practical training

-14-13 15	Practical=4	Gaining manual and craft skills for the student	The importance of filings - Safety precautions in the workshop - Types of files used and according to the metals and shapes required	Lectures and practical training	Oral exams And practical training
16	Practical=4	Gaining manual and craft skills for the student	Filing exercises to obtain a good surface . and a good angle - and filing some shapes	Lectures and practical training	Oral exams And practical training
17	Practical=4	Gaining manual and craft skills for the student	Lathe - Parts of the lathe - Measuring equipment - Different lathe operations - External surface lathe - Internal - Straight or stripped lathe - Knowing how to change the speed of the lathe with introducing the student to the necessary safety precautions inside the workshop	Lectures and practical training	Oral exams And practical training
-19-18 21-20	Practical=4	Gaining manual and craft skills for the student	Carpentry - Types of wood - Types of tools used and how to use tools from cutting, filing, drilling and shaping	Lectures and practical training	Oral exams And practical training
22	Practical=4	Gaining manual and craft skills for the student	Studying welding - The importance of welding - The necessary safety rules in welding workshops - Types of welding methods - and their relationship to the metal required to be welded with the implementation of several forms of welding	Lectures and practical training	Oral exams And practical training
24-23	Practical=4	Gaining manual and craft skills for the student	Pipes used in the field of refrigeration - With welding and cutting exercises with the use of tools in this field	Lectures and practical training	Oral exams And practical training
25	Practical=4	Gaining manual and craft skills for the student	Expanding and splicing pipes / Studying the tools used in the field of expanding the pipe in preparation for connecting the two pipes to each other with the use of tools specific to this field	Lectures and practical training	Oral exams And practical training
256	Practical=4	Gaining manual and craft skills for the student	Gas welding - Parts of the welding system - Copper welding - Silver and brass with an experience of welding two pieces of pipe - Aluminum welding - Iron and copper welding using brass	Lectures and practical training	Oral exams And practical training
-28-27 30-29	Practical=4	Gaining manual and craft skills for the student	Compression cooling system in small refrigeration systems (home refrigerator - freezer - air conditioner)	Lectures and practical training	Oral exams And practical training

#### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

#### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Engineering drawing book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

<b>1. Course Name:</b>	<b>Rights and democracy</b>				
<b>2. Course Code:</b>	RD				
<b>3. Semester / Year:</b>	First Stage / Annual Course				
<b>4. Description Preparation Date:</b>	8 / 12 /2024				
<b>5. Available Attendance Forms:</b>	Theoretical				
<b>6. Number of Credit Hours (Total) / Number of Units (Total): 60 Hours / 4 Units</b>					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Name: Ali Kamel Hamzah Email: <a href="mailto:ali.hamzha@atu.edu.iq">ali.hamzha@atu.edu.iq</a>					
<b>8. Course Objectives</b>					
<b>Course Objectives</b>			<b>Teaching students the basic concepts of human rights and democra</b>		
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluat ion method
1	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Human rights, their definition, and goals The roots of human rights and their development in human history: human rights in ancient and medieval times	Lectures and practical training	Oral exams And practical training
2	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Human rights in ancient civilizations, especially the Mesopotamian civilization	Lectures and practical training	Oral exams And practical training
3	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Human rights in the Middle Ages: human rights in political doctrines, schools and theories, human rights in companies and their declarations, revolutions and constitutions (English documents, American Revolution, French Revolution, Russian Revolution) Human rights in contemporary and modern history: international recognition of human rights since World War I and the League of Nations	Lectures and practical training	Oral exams And practical training

4	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Regional recognition of human rights: European Convention on Human Rights 1950 American Convention on Human Rights 1969 African Charter on Human Rights 1981 Arab Charter on Human Rights 1994	Lectures and practical training	Oral exams And practical training
5	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Non-governmental organizations and human rights (International Committee of the Red Cross, Amnesty International, Human Rights Watch) National human rights organizations	Lectures and practical training	Oral exams And practical training
6	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Human rights in Iraqi constitutions between theory and reality	Lectures and practical training	Oral exams And practical training
7	Thermotical=2	Teaching students the basic concepts of human rights and democracy	The relationship between human rights and public freedoms: 1- In the Universal Declaration of Human Rights , In regional charters and national constitutions	Lectures and practical training	Oral exams And practical training
8	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Necessary human rights and collective human rights	Lectures and practical training	Oral exams And practical training
9	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Economic, social and cultural human rights and civil and political human rights Modern human rights: facts in development, the right to a clean environment, the right to solidarity, the right to religion	Lectures and practical training	Oral exams And practical training
10	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Guarantees of respect and protection of human rights at the national level, guarantees in the constitution and laws, guarantees in the principle of the rule of law. Guarantees in constitutional oversight, guarantees in freedom of the press and public opinion, the role of non-governmental organizations in respecting and protecting human rights.	Lectures and practical training	Oral exams And practical training
11	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Guarantees, respect and protection of human rights at the international level: - The role of the United Nations and its specialized agencies in providing guarantees - The role of regional organizations (the Arab League, the European Union, the African Union, the Organization of American States, the ASEAN Organization) - The role of international non-governmental organizations and public opinion in respecting and protecting human rights	Lectures and practical training	Oral exams And practical training
12	Thermotical=2	Teaching students the basic concepts of human rights and democracy	The general theory of freedoms: the origin of rights and freedoms, the project's position on declared rights and freedoms, the use of the term general freedoms. The functional nature of the concept of public freedoms: philosophical considerations of the functional right, structural considerations of the positive right, economic considerations and public freedoms.	Lectures and practical training	Oral exams And practical training
13	Thermotical=2	Teaching students the basic concepts of human rights and democracy	The legal rule of the state of law, Regulation of public freedoms by public authorities, Non-judicial litigation or grievance, Judicial appeal, determining the state's responsibility for its legitimate actions	Lectures and practical training	Oral exams And practical training
14	Thermotical=2	Teaching students the basic concepts of human rights and democracy	The impact of double judiciary on public freedoms - Public freedoms under administrative jurisprudence Equality: The historical development of the concept of equality	Lectures and practical training	Oral exams And practical training
15	Thermotical=2	Teaching students the basic concepts of human rights and democracy	The modern development of the idea of equality - gender equality - Equality between individuals according to their beliefs and race	Lectures and practical training	Oral exams And practical training
16	Thermotical=2	Teaching students the basic concepts of human rights and democracy	The concept of freedoms, classification of public freedoms Fundamental freedoms, intellectual freedoms, economic and social freedoms	Lectures and practical training	Oral exams And practical training

17	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Freedom, security and feeling of reassurance , Freedom to come and go	Lectures and practical training	Oral exams And practical training
18	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Intellectual freedoms: freedom of opinion, freedom of belief , Freedom of education	Lectures and practical training	Oral exams And practical training
19	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Freedom of the press , Freedom of society	Lectures and practical training	Oral exams And practical training
20	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Anti-sabotage law , Freedom of association	Lectures and practical training	Oral exams And practical training
21	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Freedoms with economic and social content , Freedom of action	Lectures and practical training	Oral exams And practical training
22	Thermotical=2	Teaching students the basic concepts of human rights and democracy	The right to own property	Lectures and practical training	Oral exams And practical training
23	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Freedom of trade and industry	Lectures and practical training	Oral exams And practical training
24	Thermotical=2	Teaching students the basic concepts of human rights and democracy	women freedom	Lectures and practical training	Oral exams And practical training
25	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Political parties and public freedoms	Lectures and practical training	Oral exams And practical training
26	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Public freedoms in the world	Lectures and practical training	Oral exams And practical training
27	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Scientific and technical progress and public freedoms	Lectures and practical training	Oral exams And practical training
28	Thermotical=2	Teaching students the basic concepts of human rights and democracy	The future of public freedoms	Lectures and practical training	Oral exams And practical training
29	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Democracy, its definition, types , Concepts of democracy , Democracy in the Third World	Lectures and practical training	Oral exams And practical training
30	Thermotical=2	Teaching students the basic concepts of human rights and democracy	Democratic systems in the world	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Systematic human rights book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name	Engineering mechanics				
2. Course Code	EM				
3. Semester / Year:	First Stage / Annual Course				
4. Description Preparation Date:	8 / 12 /2024				
5. Available Attendance Forms:	Theoretical and practical study				
6. Number of Credit Hours (Total) / Number of Units (Total):- <b>90 Hours / 6 Units</b>					
7. Course administrator's name (mention all, if more than one name)					
Name: Aala Suhail Najim Email: <a href="mailto:Aalasuhammad@gmail.com">Aalasuhammad@gmail.com</a>					
8. Course Objectives					
Course Objectives			Teaching the student about car breakdowns and how to maintain them		
9. Teaching and Learning Strategies					
Strategy		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2 Practical=1	The student can learn about general mechanics	Introduction & topics of mechanics , Definition of mechanics science & the branches basic quantities & units , Applications by using mechanics in the life	Lectures and practical training	Oral exams And practical training
2-3	Theoretical=2 Practical=1	The student can learn about general mechanics	Force , resolution and resultant . vectors analytic + applications	Lectures and practical training	Oral exams And practical training
4-5-6-7	Theoretical=2 Practical=1	The student can learn about general mechanics	Moment of the force & applications Couples , applications	Lectures and practical training	Oral exams And practical training
8-9	Theoretical=2 Practical=1	The student can learn about general mechanics	Equilibrium , definition & the conditions and applications	Lectures and practical training	Oral exams And practical training
10	Theoretical=2 Practical=1	The student can learn about general mechanics	Free body diagram , procedure of the drawing "F.B.D"	Lectures and practical training	Oral exams And practical training
11-12	Theoretical=2 Practical=1	The student can learn about general mechanics	Friction , theory and applications types of the friction , coefficient of friction , angle of friction	Lectures and practical training	Oral exams And practical training
13	Theoretical=2 Practical=1	The student can learn about general mechanics	Center of gravity & centroid applications , lines	Lectures and practical training	Oral exams And practical training
14	Theoretical=2 Practical=1	The student can learn about general mechanics	Center of gravity & centroid , application , single area	Lectures and practical training	Oral exams And practical training

15-16	Theoretical=2 Practical=1	The student can learn about general mechanics	Moment of inertial , definition , single area	Lectures and practical training	Oral exams And practical training
17-18	Theoretical=2 Practical=1	The student can learn about general mechanics	Moment of inertial , application i- parallel axis theory transfer of axis	Lectures and practical training	Oral exams And practical training
19	Theoretical=2 Practical=1	The student can learn about general mechanics	Dynamics science definition the Newton's second law and application	Lectures and practical training	Oral exams And practical training
20	Theoretical=2 Practical=1	The student can learn about general mechanics	Rectilinear motion definition and applications	Lectures and practical training	Oral exams And practical training
21	Theoretical=2 Practical=1	The student can learn about general mechanics	Free fall lows & application	Lectures and practical training	Oral exams And practical training
22	Theoretical=2 Practical=1	The student can learn about general mechanics	Curvilinear motion low's & applications	Lectures and practical training	Oral exams And practical training
23	Theoretical=2 Practical=1	The student can learn about general mechanics	Rotational motion about the fixed axes	Lectures and practical training	Oral exams And practical training
24	Theoretical=2 Practical=1	The student can learn about general mechanics	Strength of material , sort of the strain	Lectures and practical training	Oral exams And practical training
25	Theoretical=2 Practical=1	The student can learn about general mechanics	Strength of material , sort of the stress	Lectures and practical training	Oral exams And practical training
26	Theoretical=2 Practical=1	The student can learn about general mechanics	Drawing the curvature of the stress force	Lectures and practical training	Oral exams And practical training
27	Theoretical=2 Practical=1	The student can learn about general mechanics	Tension and compresses	Lectures and practical training	Oral exams And practical training
28	Theoretical=2 Practical=1	The student can learn about general mechanics	Sheering force , definition and application	Lectures and practical training	Oral exams And practical training
29	Theoretical=2 Practical=1	The student can learn about general mechanics	Pascal & Archimedes theory and lows , applications	Lectures and practical training	Oral exams And practical training
30	Theoretical=2 Practical=1	The student can learn about general mechanics	Benully formula , applications	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Modern car maintenance book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

<b>1. Course Name</b>	<b>Mathematics</b>				
<b>2. Course Code</b>	M				
<b>3. Semester / Year:</b>	First Stage / Annual Course				
<b>4. Description Preparation Date:</b>	8 / 12 /2024				
<b>5. Available Attendance Forms:</b>	Theoretical study				
<b>6. Number of Credit Hours (Total) / Number of Units (Total): 60 Hours / 4 Units</b>					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Name: Alaa Hussain Majeed Email: <a href="mailto:alaa.majeed.bib23@atu.edu.iq">alaa.majeed.bib23@atu.edu.iq</a>					
<b>8. Course Objectives</b>					
<b>Course Objectives</b>		<b>Teaching the student, a number of topics, such as matrices, determinants, functions, differentiation and integration, and statistics.</b>			
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Matrices, determinants, and their properties	Lectures and practical training	Oral exams And practical training
2	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Solving linear equations Linear equations, Cramer's method, applications, arc analysis, vectors	Lectures and Practical training	Oral exams And practical training
3	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Vectors, analysis of limits, types of vectors, quantities, standard vectors, curve algebra, vector arithmetic operations	Lectures and practical training	Oral exams And practical training
4	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Unit orthogonal vectors, vector scaling, scalar and cross product, applications to vectors, arc moment analysis	Lectures and practical training	Oral exams And practical training

5	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Logarithm, definition of logarithm, laws of logarithm and how to use them, solving logarithmic equations	Lectures and practical training	Oral exams And practical training
6	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Trigonometric ratios and the relationship between them, some laws in trigonometric ratios, the function, the meaning of the function, the independent and dependent variables, the function	Lectures and practical training	Oral exams And practical training
7	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Measurements, purpose of trigonometric and algebraic functions, applications of linear velocity, areas	Lectures and practical training	Oral exams And practical training
8	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Details, derivative, derivative of algebraic functions, applications of the implicit function chain rule	Lectures and practical training	Oral exams And practical training
9	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Higher order derivative, derivative of the exponential function, derivative of the logarithmic function	Lectures and practical training	Oral exams And practical training
10	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Derivative of trigonometric functions, derivative of circular functions	Lectures and practical training	Oral exams And practical training
11	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Partial differentiation	Lectures and practical training	Oral exams And practical training
12	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Applications on the derivative (slope equation, perpendicular, velocity and acceleration)	Lectures and practical training	Oral exams And practical training
13	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Derivative applications (instantaneous change)	Lectures and practical training	Oral exams And practical training
14	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Increasing, decreasing, maximum and minimum limits, inflection points, graphing the function	Lectures and practical training	Oral exams And practical training
15	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Integration, indefinite integration, integration of algebraic functions	Lectures and practical training	Oral exams And practical training
16	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Integration of exponential and logarithmic functions	Lectures and practical training	Oral exams And practical training
17	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Integration of trigonometric functions	Lectures and practical training	Oral exams And practical training
18	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Definite integral, applications (distance under the curve, distance between the curve)	Lectures and practical training	Oral exams And practical training
19	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	The rotational magnitudes and arc length of the curve	Lectures and practical training	Oral exams And practical training
20	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Approximation in integration (trapezoid rule, Simpson's rule)	Lectures and practical training	Oral exams And practical training
21	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Integration methods, retail integration	Lectures and practical training	Oral exams And practical training
22	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Integration by compensation method	Lectures and practical training	Oral exams And practical training

23	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Integration by partial fraction method for the first	Lectures and practical training	Oral exams And practical training
24	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Solving differential equations of the first order, i.e., discrete homogeneous	Lectures and practical training	Oral exams And practical training
25	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Differential equations - linear - applications	Lectures and practical training	Oral exams And practical training
26	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Complex numbers - addition - subtraction - division - multiplication	Lectures and practical training	Oral exams And practical training
27	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Applied formula: Converting the carpentered characteristic to linear and vice versa	Lectures and practical training	Oral exams And practical training
28	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Statistical operations, frequency distributions, histograms, and frequency curve	Lectures and practical training	Oral exams And practical training
29	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Statistical operations, frequency distributions, histograms, and frequency curve	Lectures and practical training	Oral exams And practical training
30	Theoretical=2	The student learns about a number of topics, such as matrices, determinants	Mean, range, standard deviation, variance	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Lectures

Main references (sources)

Calculus Analysis Geometry, Thomas

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1..Course Name	English language				
2.Course Code	E L				
3.Semester / Year	First Stage / Annual Course				
4.Description Preparation Date:	8 / 12 /2024				
5.Available Attendance Forms:	Theoretical study				
6.Number of Credit Hours (Total) / Number of Units (Total): <b>30 Hours / 2 Units</b>					
7.Course administrator's name (mention all, if more than one name)					
Name: Nuha Kasim Suhail Email: <a href="mailto:alaa.majeed.bib23@atu.edu.iq">alaa.majeed.bib23@atu.edu.iq</a>					
8.Course Objectives					
<b>Course Objectives</b>	To provide the students with basic skills in both general and scientific English Language				
9.Teaching and Learning Strategies					
<b>Strategy</b>	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Unit -1- Introduction and Review to English language. Introduction to parts of speech. Sentence Patterns.	Lectures and practical training	Oral exams And practical training
5-6	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Unit -2- Reading Comprehension and structure (selected scientific passages general to all specializations)	Lectures and practical training	Oral exams And practical training

7-8	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Scientific Attitude (Simple present)	Lectures and practical training	Oral exams And practical training
9-10	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Mathematics(passive)	Lectures and practical training	Oral exams And practical training
11-12	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Scientific Methods (simple past)	Lectures and practical training	Oral exams And practical training
13	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Test	Lectures and practical training	Oral exams And practical training
14-15	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Unit -4- Conversation (from daily life Meeting people	Lectures and practical training	Oral exams And practical training
16-17	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Talking about your job	Lectures and practical training	Oral exams And practical training
18-19	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Unit -5- The use of library, Dictionary, and Internet.	Lectures and practical training	Oral exams And practical training
20-21	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Unit -6- Translation Selected topics from internet to be translated.	Lectures and practical training	Oral exams And practical training
22-25	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Unit -7- Writing Technical Reports	Lectures and practical training	Oral exams And practical training
25-29	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Unit -8- Terminology Selected Passages according to specializations	Lectures and practical training	Oral exams And practical training
30	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Final Test	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Technical English book project

Main references (sources)

Methodical books

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1..Course Name	Arabic language				
2.Course Code	AL				
3.Semester / Year	First Stage / Annual Course				
4.Description Preparation Date:	8 / 12 /2024				
5.Available Attendance Forms:	Theoretical study				
6.Number of Credit Hours (Total) / Number of Units (Total): <b>30 Hours / 2 Units</b>					
7.Course administrator's name (mention all, if more than one name)					
Name: Noor Aied Email: <a href="mailto:noor.serkal.iba14@atu.edu.iq">noor.serkal.iba14@atu.edu.iq</a>					
8.Course Objectives					
Course Objectives	To recognize the beauty of the Arabic language and its literature, and for the student to acquire the ability to study the branches of the Arabic language				
9.Teaching and Learning Strategies					
Strategy	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=1	To recognize the beauty of the Arabic language	Parts of speech: the noun and its inflectional signs	Lectures and Practical training	Oral exams And practical training
2	Theoretical=1	To recognize the beauty of the Arabic language	Applied models on the noun from the Holy Quran and Arabic literature	Lectures and Practical training	Oral exams And practical training
3	Theoretical=1	To recognize the beauty of the Arabic language	Verb, its types and conditions	Lectures and Practical training	Oral exams And practical training
4	Theoretical=1	To recognize the beauty of the Arabic language	Applied models on the verb from the Holy Quran and Arabic literature	Lectures and Practical training	Oral exams And practical training

5	Theoretical=1	To recognize the beauty of the Arabic language	Types of letters	Lectures and Practical training	Oral exams And practical training
6	Theoretical=1	To recognize the beauty of the Arabic language	Applied models on the letters from the Holy Quran and Arabic literature	Lectures and Practical training	Oral exams And practical training
7	Theoretical=1	To recognize the beauty of the Arabic language	Solar and lunar letters and the difference between them	Lectures and Practical training	Oral exams And practical training
8	Theoretical=1	To recognize the beauty of the Arabic language	Applied models on the previous topic	Lectures and Practical training	Oral exams And practical training
9	Theoretical=1	To recognize the beauty of the Arabic language	Rules of the tied and long Taa	Lectures and Practical training	Oral exams And practical training
10	Theoretical=1	To recognize the beauty of the Arabic language	Applied models on the tied and long Taa from the Holy Quran and Arabic literature	Lectures and Practical training	Oral exams And practical training
11	Theoretical=1	To recognize the beauty of the Arabic language	Rules for writing the extended and shortened alif	Lectures and Practical training	Oral exams And practical training
12	Theoretical=1	To recognize the beauty of the Arabic language	Applied models on the extended and shortened alif from the Holy Quran and Arabic literature	Lectures and Practical training	Oral exams And practical training
13	Theoretical=1	To recognize the beauty of the Arabic language	Texts from pre-Islamic poetry / Imru' al-Qais - Antarah ibn Shaddad	Lectures and Practical training	Oral exams And practical training
14	Theoretical=1	To recognize the beauty of the Arabic language	Texts from Islamic poetry / Hassan ibn Thabit - al-Hutay'ah	Lectures and Practical training	Oral exams And practical training
15	Theoretical=1	To recognize the beauty of the Arabic language	Modern prose / novel and story	Lectures and Practical training	Oral exams And practical training
16	Theoretical=1	To recognize the beauty of the Arabic language	Mistakes Common linguistic and spelling in administrative correspondence	Lectures and Practical training	Oral exams And practical training
17	Theoretical=1	To recognize the beauty of the Arabic language	Rules for writing numbers	Lectures and Practical training	Oral exams And practical training
18	Theoretical=1	To recognize the beauty of the Arabic language	Practical models on the rules for writing numbers from the Holy Quran and Arabic literature	Lectures and Practical training	Oral exams And practical training
19	Theoretical=1	To recognize the beauty of the Arabic language	The five objects / 1- The object 2- The object for which	Lectures and Practical training	Oral exams And practical training
20	Theoretical=1	To recognize the beauty of the Arabic language	Practical models on the object and the object for which	Lectures and Practical training	Oral exams And practical training
21	Theoretical=1	To recognize the beauty of the Arabic language	The absolute object , The object in which 5- The object with	Lectures and Practical training	Oral exams And practical training
22	Theoretical=1	To recognize the beauty of the Arabic language	Practical models and exercises	Lectures and Practical training	Oral exams And practical training

23	Theoretical=1	To recognize the beauty of the Arabic language	The vocative and its types	Lectures and Practical training	Oral exams And practical training
24	Theoretical=1	To recognize the beauty of the Arabic language	Practical models and exercises on the vocative	Lectures and Practical training	Oral exams And practical training
25	Theoretical=1	To recognize the beauty of the Arabic language	Dad and Dhad	Lectures and Practical training	Oral exams And practical training
26	Theoretical=1	To recognize the beauty of the Arabic language	Models on Dad and Dhad	Lectures and Practical training	Oral exams And practical training
27	Theoretical=1	To recognize the beauty of the Arabic language	Punctuation marks	Lectures and Practical training	Oral exams And practical training
28	Theoretical=1	To recognize the beauty of the Arabic language	Twenty-eight Old prose texts / Rhetoric as a model	Lectures and Practical training	Oral exams And practical training
29	Theoretical=1	To recognize the beauty of the Arabic language	Texts from Umayyad poetry / Al-Farazdaq - Jarir	Lectures and Practical training	Oral exams And practical training
30	Theoretical=1	To recognize the beauty of the Arabic language	Texts from modern poetry / Al-Sayyab - Nazik Al-Malaika	Lectures and Practical training	Oral exams And practical training

## 11 Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

## 12 Learning and Teaching Resources

Required textbooks (curricular books, if any)	Technical Arabic book project
Main references (sources)	Methodical books
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Stage 2 :- For all branches

### Course Description Form

1. Course Name:	<b>Industrial management</b>				
2. Course Code:	I.M				
3. Semester / Year:	Second Stage / Annual Course				
4. Description Preparation Date:	<b>8 / 12 /2024</b>				
5. Available Attendance Forms	Theoretical study				
6. Number of Credit Hours (Total) / Number of Units (Total):	<b>60 Hours / 4 Units</b>				
7. Course administrator's name (mention all, if more than one name)	Name: Raqeyah Jawad Nagi Email: <a href="mailto:raqeyah.najy@atu.edu.iq">raqeyah.najy@atu.edu.iq</a>				
8. Course Objectives	Teaching the student the basic concepts of management, power stations, and the study and management of projects				
9. Teaching and Learning Strategies	Strategy 1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Strategic Planning	Lectures and practical training	Oral exams And practical training
3-4	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Strategic Management	Lectures and practical training	Oral exams And practical training
5-6	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Total Quality Management	Lectures and practical training	Oral exams And practical training
7-8	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Supply Chain Management	Lectures and practical training	Oral exams And practical training
9-10	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Project Management	Lectures and practical training	Oral exams And practical training
11-12	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Productivity and Process Improvement	Lectures and practical training	Oral exams And practical training

13-14	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Quality Management and Quality Assurance	Lectures and practical training	Oral exams And practical training
15-16	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Statistics and Mathematics in Management	Lectures and practical training	Oral exams And practical training
17-18	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Enterprise Resource Planning	Lectures and practical training	Oral exams And practical training
19-20	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Decision Analysis	Lectures and practical training	Oral exams And practical training
21-22	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Risk Management	Lectures and practical training	Oral exams And practical training
23-24	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Innovation and Change Management	Lectures and practical training	Oral exams And practical training
25-26	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Information Technology in Industrial Management	Lectures and practical training	Oral exams And practical training
27-28	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Industrial Economics and Finance	Lectures and practical training	Oral exams And practical training
29-30	Theoretical=2	Teaching the student the basic concepts of management, power stations, and the study and management of projects	Occupational Health and Safety in the Industrial Environment	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Industrial management book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1. Course Name:	<b>Computer and Artificial Intelligence</b>
2. Course Code:	CA
3. Semester / Year:	Second Stage / Annual Course
4. Description Preparation Date:	<b>8 / 12 /2024</b>
5. Available Attendance Forms:	Theoretical and partial study
6. Number of Credit Hours (Total) / Number of Units (Total):	<b>60 Hours / 2 Units</b>

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

Name: Sarah Salim Hasan

Email: [sara.hassan.iba101@atu.edu.iq](mailto:sara.hassan.iba101@atu.edu.iq)

8. Course Objectives

Course Objectives

**Teaching the student the basic concepts of the Internet, Excel, and AutoCAD**

9. Teaching and Learning Strategies

Strategy

- 1-Reciprocal Teaching strategy
- 2- Educational bag
- 3- Discussion strategy
- 4- E-learning strategy
- 5- E-learning strategy

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
3-2-1	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	The concept of networks and its types - the concept of the Internet -its operation - description of the home screen and its components - how to connect to the World Wide Web ) Web - (benefiting from the famous search engines Yahoo , Goggle – Learn about ways to search for and access information	Lectures and practical training	Oral exams And practical training
-6-5-4 -9-8-7 10	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	Excel program : Learn about the concept of the program: its benefits, specifications, features, and ways to operate it, and learn about the main screen and its components, and how it contains various effective menus and tools. The concept of the cell, basic data types and how to enter them How to Save Workbook , Worksheet	Lectures and practical training	Oral exams And practical training

			<p>Close the program and close the file  Open the saved file, enter data, perform simple calculations, and learn how to adjust or format and structure data within a single cell or group of cells. Learn about ways to collect data or groups of cells in their different forms, as well as how to sort data Use some of the functions provided by the program such as , Sum, Min, Max &lt; count, SQRT, Average and other useful related statistical functions Learn about the editing process provided by the program, how to copy data or move data, and learn about the concept of copying mathematical operations, as well as the concept of relative cells and absolute cells . Control cell width : Change its style and format by using the formatting tools</p> <p>Dealing with charts and how to convert digital and textual data into charts of various types through the Chart Wizard command and learning how to make the modifications and revisions provided by the program. Learn how to add or delete rows or columns on a work page and how to print digital data or charts</p>		
11	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	<p>Auto CAD damage recognition program - Arc ) – Absolute –Relative – Polar (line  Multiline – line – point – circle depends on the different working environment of the screen Menus – Screen –Scroll Bars –Tool Bars – Properties</p>	Lectures and practical training	Oral exams And practical training
12	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	<p>Prepare a drawing sheet - Open a new file -Limits – Drawing units – Grid - Jump , Snap ,save as , Save</p>	Lectures and practical training	Oral exams And practical training
-14-13 15	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	<p>Learn about chart drawing commands</p>	Lectures and practical training	Oral exams And practical training
-17-16 18	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	<p>Learn about editing commands  Mirror - Move - Copy – Offset</p>	Lectures and practical training	Oral exams And practical training
19	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	<p>Fine drawing Osnap</p>	Lectures and practical training	Oral exams And practical training
20	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	<p>Add dimensions</p>	Lectures and practical training	Oral exams And practical training
21	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	<p>Add text and sectors Hatch</p>	Lectures and practical training	Oral exams And practical training

22	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	Control drawing specifications Layer - Properties - linotypes -	Lectures and practical training	Oral exams And practical training
23	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	Blocks and Attributes	Lectures and practical training	Oral exams And practical training
24	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	Measure – Block – wblock – explode – divide	Lectures and practical training	Oral exams And practical training
26-25	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	Introduction to 3D drawing Ucs - Vports - Elev-thickness	Lectures and practical training	Oral exams And practical training
28-27	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	Create3 D surfaces	Lectures and practical training	Oral exams And practical training
30 - 29	Theoretical=1 practical=1	Teaching the student the basic concepts of the Internet, Excel, and AutoCAD	Create3 D solids	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Car parts book

Main references (sources)

Currently available methodical book

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1.Course Name:	<b>Baath crimes</b>				
2.Course Code	<b>B C</b>				
3.Semester / Year:	<b>Second Stage / Annual Course</b>				
4.Description Preparation Date:	<b>8 / 12 /2024</b>				
5.Available Attendance Forms:	theoretical study				
6.Number of Credit Hours (Total) / Number of Units (Total): <b>60 Hours / 4 Units</b>					
7.Course administrator's name (mention all, if more than one name)					
Name: Assad Dakel Hadi Email: <a href="mailto:assad.hadi@atu.edu.iq">assad.hadi@atu.edu.iq</a>					
8.Course Objectives					
<b>Course Objectives</b>	It is to shed light for the generations born after the fall of the regime on the many crimes committed by the Baath Party regime and Saddam Hussein against the Iraqi people. These crimes were diverse, including war crimes, crimes against humanity, genocide, and economic crimes				
9.Teaching and Learning Strategies					
<b>Strategy</b>	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=2	Learn about the crimes committed by the former regime	The concept of crimes linguistically and terminologically Crime departments	Lectures and practical training	Oral exams And practical training
2	Theoretical=2	Learn about the crimes committed by the former regime	Types of international crimes	Lectures and practical training	Oral exams And practical training
3	Theoretical=2	Learn about the crimes committed by the former regime	Decisions issued by the Supreme Criminal Court	Lectures and practical training	Oral exams And practical training
4	Theoretical=2	Learn about the crimes committed by the former regime	Psychological and social crimes and their effects, and the most prominent	Lectures and practical training	Oral exams And practical training

5	Theoretical=2	Learn about the crimes committed by the former regime	violations of the Baathist regime in Iraq	Lectures and practical training	Oral exams And practical training
6	Theoretical=2	Learn about the crimes committed by the former regime	Psychological crimes, mechanism of psychological crimes	Lectures and practical training	Oral exams And practical training
7	Theoretical=2	Learn about the crimes committed by the former regime	The mechanism of pressure and psychological punishment / the mechanism of scientific impoverishment / the effects of psychological crimes	Lectures and practical training	Oral exams And practical training
8	Theoretical=2	Learn about the crimes committed by the former regime	Social crimes, first section	Lectures and practical training	Oral exams And practical training
9	Theoretical=2	Learn about the crimes committed by the former regime	Social crimes, section two	Lectures and practical training	Oral exams And practical training
10	Theoretical=2	Learn about the crimes committed by the former regime	Violations of Iraqi laws and their forms, Section One	Lectures and practical training	Oral exams And practical training
11	Theoretical=2	Learn about the crimes committed by the former regime	Violations of Iraqi laws and their forms, Section Two	Lectures and practical training	Oral exams And practical training
12	Theoretical=2	Learn about the crimes committed by the former regime	Some decisions regarding political and military violations of the Baath regime	Lectures and practical training	Oral exams And practical training
13	Theoretical=2	Learn about the crimes committed by the former regime	Prison and detention places of the Baath regime	Lectures and practical training	Oral exams And practical training
14	Theoretical=2	Learn about the crimes committed by the former regime	Environmental crimes of the Baath regime	Lectures and practical training	Oral exams And practical training
15	Theoretical=2	Learn about the crimes committed by the former regime	Environmental crimes in Basra	Lectures and practical training	Oral exams And practical training
16	Theoretical=2	Learn about the crimes committed by the former regime	Contamination with radioactive materials / Halabja	Lectures and practical training	Oral exams And practical training
17	Theoretical=2	Learn about the crimes committed by the former regime	Destruction of cities and villages	Lectures and practical training	Oral exams And practical training
18	Theoretical=2	Learn about the crimes committed by the former regime	The battle of the Jassim River and the burning of oil wells	Lectures and practical training	Oral exams And practical training
19	Theoretical=2	Learn about the crimes committed by the former regime	Drying the marshes	Lectures and practical training	Oral exams And practical training
20	Theoretical=2	Learn about the crimes committed by the former regime	Demolishing palm groves, trees and crops	Lectures and practical training	Oral exams And practical training
21	Theoretical=2	Learn about the crimes committed by the former regime	Introduction to mass grave crimes	Lectures and practical training	Oral exams And practical training

22	Theoretical=2	Learn about the crimes committed by the former regime	Incidents of genocide graves committed by the Baathist regime/events of 1963	Lectures and practical training	Oral exams And practical training
23	Theoretical=2	Learn about the crimes committed by the former regime	Introduction to the events spanning the years 2003-1979 and their relationship to mass graves.	Lectures and practical training	Oral exams And practical training
24	Theoretical=2	Learn about the crimes committed by the former regime	The events of the Iran-Iraq War 1980-1988 AD and their relationship to mass graves	Lectures and practical training	Oral exams And practical training
25	Theoretical=2	Learn about the crimes committed by the former regime	The events of 1988-1987 and their relationship to mass graves	Lectures and practical training	Oral exams And practical training
26	Theoretical=2	Learn about the crimes committed by the former regime	The events of the Shaabani uprising in 1991 AD and their relationship to mass graves	Lectures and practical training	Oral exams And practical training
27	Theoretical=2	Learn about the crimes committed by the former regime	Genocide graves related to the Iran-Iraq War for the period 1980-1988 AD:	Lectures and practical training	Oral exams And practical training
28	Theoretical=2	Learn about the crimes committed by the former regime	Graves of the genocide of the Barzunian Kurds in 1983	Lectures and practical training	Oral exams And practical training
29	Theoretical=2	Learn about the crimes committed by the former regime	Genocide graves of the 1991 Shaaban Iya uprising, first section	Lectures and practical training	Oral exams And practical training
30	Theoretical=2	Learn about the crimes committed by the former regime	Genocide Graves of the 1991 Shaaban Iya Uprising, Section Two	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Baath crimes book

Main references (sources)

Methodical books

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet

## Course Description Form

1..Course Name:	The project				
2.Course Code:	P				
3.Semester / Year:	Second Stage / Annual Course				
4.Description Preparation Date:	8 / 12 /2024				
5.Available Attendance Forms:	Theoretical study				
6.Number of Credit Hours (Total) / Number of Units (Total): <b>60 Hours / 4 Units</b>					
7.Course administrator's name (mention all, if more than one name)					
Name: Asraa Adnan Nagem			Email: <a href="mailto:asraa@atu.edu.iq">asraa@atu.edu.iq</a>		
Name: Ahmed Hadi Hatif			Email: <a href="mailto:ahmed.shuber@gmail.com">ahmed.shuber@gmail.com</a>		
Name: Inas Jabbar Mohammed			Email: <a href="mailto:inasalrubaiy1973@gmail.com">inasalrubaiy1973@gmail.com</a>		
Name: Ali Assim Abd Al-Razak			Email: <a href="mailto:ali.nit2009@atu.edu.iq">ali.nit2009@atu.edu.iq</a>		
8.Course Objectives					
<b>Course Objectives</b>		The course works to provide the student with practical skills and abilities by adopting the idea of repairing or building a refrigeration device Integrated while transferring the theoretical and applied information he studied into a tangible practical reality			
9.Teaching and Learning Strategies					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	Theoretical=2	Provide the student with practical skills and abilities	Student projects are distributed to branch students by the branch or department and under the supervision of a professor, so that the projects include one of the following aspects: 1- Making integrated maps for a refrigeration or air conditioning device, within the specialized devices, and manufacturing parts or assembling the devices or accessories, and carrying out the necessary checks and tests on it after that. 2- The process of calculating the air conditioning loads for any public building and drawing the necessary diagrams and maps for all air ducts and water transmission pipes, as well as illustrations of the required accessories, installing the pipes and devices, the sequence of control devices, and testing the devices.	Lectures and practical training	Oral exams And practical training
11. Course Evaluation					
The degree is distributed 1-70 marks for the discussion committee's evaluation 2-30 marks or the competent supervisor's evaluation					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			According to the project topic		
Main references (sources)			Methodical books		
Recommended books and references (scientific journals, reports...)			Reports		
Electronic References, Websites			Internet		

## Course Description Form

1..Course Name	English language				
2.Course Code	E L				
3.Semester / Year	Second Stage / Annual Course				
4.Description Preparation Date:	8 / 12 /2024				
5.Available Attendance Forms:	Theoretical study				
6.Number of Credit Hours (Total) / Number of Units (Total): <b>30 Hours / 2 Units</b>					
7.Course administrator's name (mention all, if more than one name)					
Name: Nuha Kasim Suhail Email: <a href="mailto:Nuha.suhail@atu.edu.iq">Nuha.suhail@atu.edu.iq</a>					
8.Course Objectives					
<b>Course Objectives</b>		To provide the students with basic skills in both general and scientific English Language			
9.Teaching and Learning Strategies					
<b>Strategy</b>	1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy				
<b>10.Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	-Unit 1 Using questions in English, types of questions Knowing parts of speech in English	Lectures and practical training	Oral exams And practical training
5-6	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	-Unit 2 Simple present tense, present continuous tense, difference between have and have	Lectures and practical training	Oral exams And practical training
7-8 9-10 11 12 - 13	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Unit 3-Simple past tense Past continuous tense Using prepositions with time expressions Solving exercises of	Lectures and practical training	Oral exams And practical training
14-15 16-17	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	-Unit 4 Countable and uncountable nouns, quantity expressions Indefinite and definite articles, solving exercises of Unit 4	Lectures and practical training	Oral exams And practical training

18-19	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	-Unit 5 Simple future tense, verb patterns Solving exercises of Unit 5	Lectures and practical training	Oral exams And practical training
20-21	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	-Unit 6 Using the verb like, comparative and superlative adjectives Solving exercises of Unit 6	Lectures and practical training	Oral exams And practical training
22-25	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	-Unit 7 Present perfect tense and knowing the circumstances used with the present perfect Using the question tool how long Solving exercises of Unit 7	Lectures and practical training	Oral exams And practical training
25-29	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	-Unit 8 Using the verb have to in the affirmative, negative and interrogative cases Incomplete auxiliary verbs	Lectures and practical training	Oral exams And practical training
30	Theoretical=1	To provide the students with basic skills in both general and scientific English Language	Adverbial phrases If conditional Solving exercises of Unit 9	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Technical English book project
Main references (sources)	Methodical books
Recommended books and references (scientific journals, reports...)	Reports
Electronic References, Websites	Internet

## Course Description Form

1..Course Name	Arabic language				
2.Course Code	AL				
3.Semester / Year	Second Stage / Annual Course				
4.Description Preparation Date:	8 / 12 /2024				
5.Available Attendance Forms:	Theoretical study				
6.Number of Credit Hours (Total) / Number of Units (Total): <b>30 Hours / 2 Units</b>					
7.Course administrator's name (mention all, if more than one name)					
Name: Noor Aied Email: <a href="mailto:noor.serkal.iba14@atu.edu.iq">noor.serkal.iba14@atu.edu.iq</a>					
8.Course Objectives					
<b>Course Objectives</b>			To recognize the beauty of the Arabic language and its literature, and for the student to acquire the ability to study the branches of the Arabic language		
9.Teaching and Learning Strategies					
<b>Strategy</b>		1-Reciprocal Teaching strategy 2- Educational bag 3- Discussion strategy 4- E-learning strategy 5- E-learning strategy			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	Theoretical=1	To recognize the beauty of the Arabic language	Original and secondary diacritical marks	Lectures and practical training	Oral exams And practical training
2	Theoretical=1	To recognize the beauty of the Arabic language	Examples and applied exercises on the subject of diacritical marks	Lectures and practical training	Oral exams And practical training
3	Theoretical=1	To recognize the beauty of the Arabic language	Distinguishing between nouns and verbs	Lectures and practical training	Oral exams And practical training
4	Theoretical=1	To recognize the beauty of the Arabic language	Examples on noun and verb marks	Lectures and practical training	Oral exams And practical training
5	Theoretical=1	To recognize the beauty of the Arabic language	Subject and predicate	Lectures and practical training	Oral exams And practical training
6	Theoretical=1	To recognize the beauty of the Arabic language	Examples and applied exercises on subject and predicate	Lectures and practical training	Oral exams And practical training

7	Theoretical=1	To recognize the beauty of the Arabic language	Formal aspects of administrative discourse and the importance of correct language in writing it	Lectures and practical training	Oral exams And practical training
8	Theoretical=1	To recognize the beauty of the Arabic language	Examples of administrative correspondence	Lectures and practical training	Oral exams And practical training
9	Theoretical=1	To recognize the beauty of the Arabic language	The indeclinable noun	Lectures and practical training	Oral exams And practical training
10	Theoretical=1	To recognize the beauty of the Arabic language	Examples and applied exercises on the indeclinable noun from the Holy Quran and Arabic literature	Lectures and practical training	Oral exams And practical training
11	Theoretical=1	To recognize the beauty of the Arabic language	Abrogated in Arabic grammar / Defective verbs and verb-like letters	Lectures and practical training	Oral exams And practical training
12	Theoretical=1	To recognize the beauty of the Arabic language	Examples and applied exercises on abrogated in Arabic grammar from the Holy Quran and Arabic literature	Lectures and practical training	Oral exams And practical training
13	Theoretical=1	To recognize the beauty of the Arabic language	The difference between the active tea and the silent tea of femininity	Lectures and practical training	Oral exams And practical training
14	Theoretical=1	To recognize the beauty of the Arabic language	A text from Abbasid poetry / Al-Mustahabb as a model	Lectures and practical training	Oral exams And practical training
15	Theoretical=1	To recognize the beauty of the Arabic language	A text from Abbasid prose / Al-RI salah as a model	Lectures and practical training	Oral exams And practical training
16	Theoretical=1	To recognize the beauty of the Arabic language	The vocative and its types	Lectures and practical training	Oral exams And practical training
17	Theoretical=1	To recognize the beauty of the Arabic language	Examples and applied exercises on the vocative	Lectures and practical training	Oral exams And practical training
18	Theoretical=1	To recognize the beauty of the Arabic language	Dependents in grammar / 1- Adjective 2- Emphasis	Lectures and practical training	Oral exams And practical training
19	Theoretical=1	To recognize the beauty of the Arabic language	Examples and applied exercises	Lectures and practical training	Oral exams And practical training
20	Theoretical=1	To recognize the beauty of the Arabic language	Dependents / 3- Substitution 4- Conjoined	Lectures and practical training	Oral exams And practical training
21	Theoretical=1	To recognize the beauty of the Arabic language	Applied models and exercises	Lectures and practical training	Oral exams And practical training
22	Theoretical=1	To recognize the beauty of the Arabic language	How to extract the meaning of words in the dictionary	Lectures and practical training	Oral exams And practical training
23	Theoretical=1	To recognize the beauty of the Arabic language	Applied examples on the dictionary of Lisan al-Arab	Lectures and practical training	Oral exams And practical training
24	Theoretical=1	To recognize the beauty of the Arabic language	How to write scientific research	Lectures and practical training	Oral exams And practical training
25	Theoretical=1	To recognize the beauty of the Arabic language	Applied examples on writing scientific research	Lectures and practical training	Oral exams And practical training
26	Theoretical=1	To recognize the beauty of the Arabic language	A text from the Holy Quran on social justice	Lectures and practical training	Oral exams And practical training
27	Theoretical=1	To recognize the beauty of the Arabic language	A text from the Holy Quran on good conduct and morals	Lectures and practical training	Oral exams And practical training
28	Theoretical=1	To recognize the beauty of the Arabic language	A text from Arabic poetry in the Andalusian era	Lectures and practical training	Oral exams And practical training

29	Theoretical=1	To recognize the beauty of the Arabic language	The article / its types and pillars	Lectures and practical training	Oral exams And practical training
30	Theoretical=1	To recognize the beauty of the Arabic language	A model of the article	Lectures and practical training	Oral exams And practical training

### 11. Course Evaluation

The degree is distributed

1- 10 marks for the first theoretical semester and 10 marks for practical.

2- 10 marks for the second semester, theoretical + 10 marks for practical

3 - 10 marks for student activities

4 - 50 marks final exam

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Technical Arabic book project

Main references (sources)

Methodical books

Recommended books and references (scientific journals, reports...)

Reports

Electronic References, Websites

Internet