



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

# Academic Program and Course

2024



## **Introduction:**

The educational program is a coordinated and organized package of courses that include procedures and experiences organized in the form of study vocabulary, the main purpose of which is to build and refine the skills of graduates, making them qualified to meet the requirements of the labour market. It is reviewed and evaluated annually through internal or external audit procedures and programs, such as the external examiner program .

The academic program description provides a brief summary of the main features of the program and its courses, indicating the skills that students are working to acquire based on the objectives of the academic program. The importance of this description is evident because it represents the cornerstone in obtaining program accreditation, and the teaching staff participates in writing it under the supervision of the scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and changes in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, semester) in addition to adopting the description of the academic program circulated under the letter of the Department of Studies TM 3/2906 dated 5/3/2023 regarding programs that adopt the Bologna process as a basis for their work. In this regard, we cannot but emphasize the importance of writing a description of academic programs and curricula to ensure the smooth running of the educational process.



## Concepts and terms:

**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 from the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture of the future of the academic program to be an advanced, inspiring, motivating, realistic and applicable program.

**Program Mission:** Clarifies the goals and activities necessary to achieve them concisely, and identifies the program's development paths and directions.

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

**Curriculum Structure:** All courses/subjects included in the academic program according to the approved learning system (semester, annual, Bologna track) whether they are required (ministry, university, college and scientific department) with the number of academic units.

**Learning outcomes:** A consistent set of knowledge, skills and values acquired by the student after successfully completing the academic program. The learning outcomes for each course must be determined in a way that achieves the program objectives. Teaching and learning strategies: These are the strategies used by the faculty member to develop the student's teaching and learning. They are plans that are followed to achieve the learning objectives. That is, they describe all classroom and extracurricular activities to achieve the learning outcomes of the program.



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

### Academic program description form for colleges and institutes

University: Al-Furat Al-Awsat Technical University

College/ Institute Technical Institute Samawa


Scientific Department : Mechanical Technologies.

Date of filling out the file 20/3/2024

The signature : 

Name of Department Head: M.M Mujahed Kareem Oglah

Date: 20/3/2024

The signature : 

Name of scientific assistant:- M. Alaa Abd Ali Hadi

Date: 20/3/2024

The file was checked by M. M. Ahmed Abdel Mohsen Abdel Sahib

Division of Quality Assurance and University Performance

Name of the Director of the Quality Assurance and University Performance

Division: Ahmed Abdel Mohsen

Date: Signing 20/03/2024



Authentication of the Dean

20/3/2024

### **1. See the program**

to remember Vision of the program as stated in the university's bulletin and website.

The Mechanics Department 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 accredited technical services. The spirit of competition and cooperation with the complex..

### **2. Program message**

to remember The program's mission is as stated in the university's bulletin and website.

The Department of 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 distinction of the department. The general objectives are focused on graduating national technical cadres at a level of education and training capable of absorbing technology systems and supporting the process of technical development to keep pace with rapid global technical developments..

The private message includes the following:-

- 1- Using computer and Internet technologies in education and training.
- 2- Activating the relationship with the private sector in the areas of training.
- 3- Follow up on the development of training plan curricula and then update laboratories and workshops.
- 4- Interaction with the labor market and community needs for qualification and training.

### **3. Program Goals**

The Department of Mechanical Technologies/Production Branch aims to prepare technical staff specialized in the field of mechanical production techniques, who will be the link between the specialist and the skilled worker. The department

prepares and prepares the graduate and provides him with theoretical, applied and practical information to be able to carry out the tasks assigned to him.

#### 4. Program accreditation

*No YugDr*

#### 5. Other external influences

Summer training for first-year students, and many service departments and institutions receive graduates of the department, as the level of work is taken along the lines of the school curriculum.

#### 6. Program structure

comments *	percentage	Study unit	Number of courses	Program structure
Nothing	31.66	60	19	Enterprise requirements
Nothing	---	---	---	College requirements
Nothing	31.66	60	19	Department requirements
Nothing	---	Nothing	There is	summer training
Nothing	0	0	0	Other

\* Notes may include whether the course is core or elective.

Conclusion	
65	Number of hours/week for both stages
130	Number of units for the two stages

37%	Ratio of theoretical hours for the two stages
63%	The ratio of practical hours for the two stages
62%	Percentage of hours for specialized lessons for the two stages
32%	Percentage of hours for auxiliary lessons for the two stages
6%	Percentage of hours for general lessons for the two stages
270	Number of summer training hours
2220	The total number of hours plus summer training for the two stages

<b>7. Program description</b>				
<b>Credit hours</b>		<b>Name of the course or course</b>	<b>Course or course code</b>	<b>Year/level</b>
<b>practical</b>	<b>theoretical</b>			
2	2	Manufacturing processes /1	There is no code	<b>The first</b>
-	2	Material properties	There is no code	
8	-	Modulus/1	There is no code	
3	2	Mechanics	There is no code	
-	2	mathematics	There is no code	
2	1	Computer applications/1	There is no code	
3	-	Engineering drawing	There is no code	
2	1	Electrical technology	There is no code	
-	2	Rights and democracy	There is no code	
-	1	English	There is no code	
-	3	Machine parts technology	There is no code	

2	2	Manufacturing processes /2	There is no code	<b>The second</b>
2	2	Metals	There is no code	
8	-	Factor / 2	There is no code	
3		The project	There is no code	
3	-	Industrial drawing	There is no code	
-	2	Occupational management and safety	There is no code	
2	1	Computer applications/2	There is no code	
-	1	English	There is no code	

<b>8. Expected learning outcomes of the programme</b>	
<b>Knowledge</b>	
<p>A1-The student is introduced to the basic concepts of the operation of various metal cutting machines (lathe, milling machine, and many specialized machines in workshops).</p> <p>A2-The student practices and applies the foundations and concepts he has studied theoretically</p> <p>A3-The student learns about the design of laboratories and factories and how to arrange machines in workshops and lines</p> <p>Productivity</p> <p>A4-The student learns about performing periodic and emergency maintenance on machines to avoid work risks</p>	<p><b>i- Cognitive objectives</b></p>

<b>Skills</b>	
<p>B1- Providing the student with applied skills for production machines (lathing, milling, milling...)</p> <p>B2- Knowing the types of problems in production workshops and developing the optimal solution to them in the work environment</p> <p>B3- The student gains the skill of managing production workshops</p> <p>B4–Giving the student the spirit of taking care of the machine and cooperating with his colleagues to achieve the best production goals</p>	<p>B -Marathi goals <b>Forprogram</b></p>
<b>Value</b>	
<p>C1-The student's ability to think systematically and thus to make the right decision</p> <p>C2-Urging students to collect information that increases their knowledge of the specialty</p> <p>C3-Urging the student to know how to maintain his life within the work environment</p> <p>C4- Urging the student to acquire individual skills in the work environment</p> <p>C5- Implementing small practical and applied projects</p>	<p>C- Emotional and value goals.</p>

## 9. Teaching and learning strategies

Teaching and learning strategies and methods adopted in implementing the program in general.

- 1- Preparing and implementing research and projects by students within the department's curricula and presenting them at annual student conferences
- 2- Using modern technical engineering techniques and skills

- 3- Using modern teaching methods such as brainstorming and discussion within the classroom. Students' cooperation in solving students' scientific and theoretical problems and solving questions.
- 4- Preparing reports and using the Internet to collect information sources.

## 10. Evaluation methods

Implementing it in all stages of the program in general.

### Evaluation methods

1. Discussing research
2. Written tests
3. Direct feedback
4. Surprising questions
5. Various reports
6. Semester and final exams

## 11. education institution

### Faculty members

Preparing the teaching staff		Special requirements/skills (if any)	Specialization		Scientific rank
lecturer	angel		private	general	
0	5	Nothing	Thermal energy engineering	Master's Mechanical Engineering	M. M. Mujahid Karim Okla
			Refractories	Ph.D Mechanical Engineering	Dr. Ahmed Razzaq Hassan

		Nothing	Applied mechanics	Master's Mechanical Engineering	M. M. Ahmed Abdel Mohsen Abdel Sahib
			Industrial engineering	Master's Mechanical Engineering	M. M. Ali Jodi Jassim
		Nothing	Mechanical	Master's Mechanbec	M. M. Ali Abdel Azim Hilal

### **Professional development**

#### **Orienting new faculty members**

Briefly describes the process used to orient new, visiting, full-time, and part-time faculty at the institution and department levels

Involving technicians from the teaching staff in development training courses for the latest developments in their specializations and participating in courses inside and outside Iraq.

#### **Professional development for faculty members**

Briefly describe the academic and professional development plan and arrangements for faculty members such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

Involving faculty members in developmental teaching courses to update the latest developments in their specializations and participating in courses inside and outside Iraq.

### **12. Acceptance standard**

**(Developing regulations related to admission to the college or institute, whether central admission or others mentioned)**

- 1- Graduate of preparatory school, scientific branch
- 2- Graduate of vocational/industry study
- 3- Admission is for both genders (males and females)

The minimum acceptance rate is determined by the authorities represented by the Central Admissions Department in the Ministry of Higher Education and Scientific Research.

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

- **Scientific books and documents related to the program, as well as through reviewing the latest scientific equipment and films**
- **Institute website and department email.**

**14. Program development plan**

**The Mechanical Technologies Department / Production Branch always seeks to prepare and graduate distinguished technical cadres in the field of specialization to serve their country in their sectors and provide everything that is distinctive and new by adopting modern technologies and participating in building and developing the country's infrastructure. By adding modern laboratories and testing equipment that cover the needs of the course and conducting research, as well as updating curricula that are consistent with recent changes in the field of specialization.**

<b>Skills chartprogram</b>															
<b>Learning outcomes required from the programme</b>												<b>Essential or optional?</b>	<b>Course Name</b>	<b>Course Code</b>	<b>Year/level</b>
<b>Value</b>				<b>Skills</b>				<b>ShineA flutter</b>							
<b>C4</b>	<b>C3</b>	<b>C2</b>	<b>C1</b>	<b>B4</b>	<b>B3</b>	<b>B2</b>	<b>B 1</b>	<b>A4</b>	<b>A3</b>	<b>A2</b>	<b>A1</b>				
		*	*			*	*		*	*	*	<b>Basic</b>	<b>Manufacturing processes /1</b>		<b>The first</b>
		*	*			*	*		*	*	*	<b>Basic</b>	<b>Material properties</b>		
		*	*			*	*		*	*	*	<b>Basic</b>	<b>Modulus/1</b>		
		*	*			*	*		*	*	*	<b>assistant</b>	<b>Mechanics</b>		
		*	*			*	*		*	*	*	<b>assistant</b>	<b>mathematics</b>		
		*	*			*	*		*	*	*	<b>assistant</b>	<b>computer applications</b>		
		*	*			*	*		*	*	*	<b>assistant</b>	<b>Engineering drawing</b>		
		*	*			*	*		*	*	*	<b>assistant</b>	<b>Electricity technology</b>		
		*	*			*	*		*	*	*	<b>General</b>	<b>human rights</b>		

		*	*			*	*		*	*	*	<b>General</b>	the language English		
		*	*			*	*		*	*	*	<b>Basic</b>	Machine parts technology	<b>The second</b>	
		*	*			*	*		*	*	*	<b>Basic</b>	Manufacturing processes /2		
		*	*			*	*		*	*	*	<b>Basic</b>	Metals		
		*	*			*	*		*	*	*	<b>Basic</b>	Factor / 2		
												<b>Basic</b>	The project		
		*	*			*	*		*	*	*	<b>Basic</b>	Industrial drawing		
												<b>assistant</b>	Management and safety		
		*	*			*	*		*	*	*	<b>assistant</b>	Computer Technology/ 2		

		*	*			*	*		*	*	*	General	the languageEn glish		
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- Please check the boxes corresponding to the individual learning outcomes from the program subject to evaluation

## Course description form

1. Course Name	
Manufacturing processes 1	
2. Code	
The decision nothing	
3. the chapter /the year	
annual	
4. Date this was prepared	
the description 2/18/2024	
5. Attendance forms available	
Mandatory weekly attendance	
6. Number of study hours (total)/number of units (total)	
120 hours = 4 hours Weekly*30week 0 2n+2p	
7. Name of the course administrator(If more than one name is mentioned)	
Name: M. M. Ali Abdel Azim Hilal Email:	
8. Course objectives	
<p>1- The ability to analyze processes into operating components.</p> <p>2- Preparing the technological path between production units.</p> <p>3- Preparing operating cards and orders for each unit and each machine.</p> <p>And calculate the runtime components and load programs for the units.</p> <p>4- Determine the elements of quality control and quality control.</p> <p>Conduct preliminary calculations of operating costs</p>	<p><b>Objectives of study subject</b></p>
9. Teaching and learning strategies	
<ul style="list-style-type: none"> <li>● Using modern means to present the scientific and theoretical aspect, such as devices Data Show to attract attention and attract students so that the idea reaches the student better.</li> <li>● Giving students extracurricular assignments that require them to exert skills and self-explanations in experimental ways.</li> </ul>	<p><b>The strategy</b></p>

<ul style="list-style-type: none"> <li>● Interrogating students through seminars by asking thinking questions (how, why, when, where, which) to specific topics.</li> <li>● Using the method of brainstorming and feedback in order to activate the accumulated experiences of students by linking the subjects taken in the previous academic stages and linking them to the new ones.</li> </ul> <p>Providing students with practical skills by conducting practical experiments on laboratory equipment</p>	
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10. Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Definition of measurement and units of measurement, error and its causes, methods of measuring main dimensions, simple conveyor measuring devices.</b>	The student's understanding of the material	2n+2A	1
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Measuring feet (probes), their parts, uses, and types.</b>	The student's understanding of the material	2n+2A	2

Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Micrometers, their types, uses, parts, and the idea of how a micrometer works.</b>	The student's understanding of the material	2n+3A	3
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Measuring molds and their uses, types, and how to use them.</b>	The student's understanding of the material	2n+3A	4
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Measuring angles and side shapes, tools for measuring angles and measuring cups (dabaa) and their types.</b>	The student's understanding of the material	2n+3A	5
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Vocabulary details</b>	The student's understanding of the material	2n+3A	6
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Method of measuring screw elements, external and internal diameters, measuring step and</b>	The student's understanding of the material	2n+3A	7

		<b>step diameter, electronic mechanical comparison devices.</b>			
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Optical device, some modern measurement methods (acoustic frequency measuring devices, digital optical).</b>	The student's understanding of the material	2n+3A	8
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Files and their role in industrial development, the chipping process, the tools used and the processes involved in the filing process, the files used and their specifications, the machines and their types and methods of attaching</b>	The student's understanding of the material	2n+3A	9

		crafts to them, the uses of files, the method of cleaning files.			
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Cutting with a saw, the conditions that must be met in the sawing process, the saw weapon, the crowns and their types, the teeth, the method of sharpening and maintaining them, the types of manual hammer heads and the method of installing them.	The student's understanding of the material	2n+3A	10
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Drilling and grinding, types of drills, types of primers, types of primers, how to	The student's understanding of the material	2n+3A	11

		<b>perform the drilling and grinding process.</b>			
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecturetheoretical+practical	<b>Models, their types, wood used in their manufacture, and the conditions that must be met in the model.</b>	The student's understanding of the material	2n+3A	12
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecturetheoretical+practical	<b>Tools and devices used in making the model, box molds, and how to design a simple model.</b>	The student's understanding of the material	2n+3A	13
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecturetheoretical+practical	<b>Plumbing, historical overview, main methods of plumbing (cast casting, sand casting, metal mold casting, other methods of plumbing) Advantages</b>	The student's understanding of the material	2n+3A	14

		<b>of the plumbing process.</b>			
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecturetheoretical+practical	<b>Plumbing sand, plumbing sand specifications, components, plumbing sand, devices used and additives to plumbing sand.</b>	The student's understanding of the material	2n+3A	15
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecturetheoretical+practical	<b>Dumps and tools used in preparing sand molds, the process of molding a simple model and the last bench, the parasitic molds and the model molds used</b>	The student's understanding of the material	2n+3A	16
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecturetheoretical+practical	<b>Pulp, its types, pulp sand, mixture ratios and materials added to it, stages of its work</b>	The student's understanding of the material	2n+3A	17

		(mixing and preparing sand, making balls, drying it), the benefit of the drying process, ovens or methods of drying balls and their equipment.			
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Casting with metal molds, its types, centrifugal casting, and its types.	The student's understanding of the material	2n+3A	18
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Metal smelting and its foundations, types of smelting furnaces, blast furnace, main dimensions and method of operation, blast furnace, electric arc furnace,	The student's understanding of the material	2n+3A	19

		<b>reflector furnace, rotary furnace.</b>			
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Casting of castings, its equipment and foundations, cleaning of castings, casting defects, inspection of castings.</b>	The student's understanding of the material	2n+3A	20
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Welding, foundations of metal welding, clarification of the main methods of welding (pressure welding, electric arc fusion welding, other methods of fusion welding, flash welding and caustic welding), types of welding joints.</b>	The student's understanding of the material	2n+3A	21

<p><b>Discussion, quick quiz, solve problems, Homework</b></p>	<p>a lecture theoretical+practical</p>	<p><b>Hot pressure welding, including (electrical resistance welding, including spot and line welding, flash welding), cold pressure welding, pressure welding using explosives, and pressure welding using ultrasonic waves.</b></p>	<p>The student's understanding of the material</p>	<p>2n+3A</p>	<p>22</p>
<p><b>Discussion, quick quiz, solve problems, Homework</b></p>	<p>a lecture theoretical+practical</p>	<p><b>Fusion welding and gas welding, oxy-hydrogen welding and oxy-acetylene welding, types of flame, right-hand welding and left-hand</b></p>	<p>The student's understanding of the material</p>	<p>2n+3A</p>	<p>23</p>

		<b>welding, cutting with oxy-acetylene.</b>			
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Arc welding, welding current, direct and reverse polarity method, types of electrodes, packaging of metal electrodes and their types.</b>	The student's understanding of the material	2n+3A	24
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Electrode movement, methods of isolating electrodes and the welding area, electric arc welding using protective gases (carbon dioxide welding, argon tig welding, brazing welding)</b>	The student's understanding of the material	2n+3A	25

Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Atomic hydrogen arc welding, arc welding, fusion welding.</b>	The student's understanding of the material	2n+3A	26
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Temperature welding, caustic welding (mortar welding, plumbing welding) and some modern types of welding (laser welding, electron beam welding).</b>	The student's understanding of the material	2n+3A	27
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Welding defects, welding tests.</b>	The student's understanding of the material	2n+3A	28
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Metal forming, the theory of forming, the foundations of cold and hot forging, blacksmithing, the foundations of	The student's understanding of the material	2n+3A	29

		blacksmithing and its methods (manual, mechanical), blacksmithing equipment, manual and mechanical, blacksmithing elements.			
<b>11. Course evaluation</b>					
<ol style="list-style-type: none"> <li>1. Daily oral and written exams</li> <li>2. ExamsFSolid and final.</li> <li>3. Marks for participation, questions and discussion of theoretical and practical study topics During the course of lectures.</li> <li>4. Grades for homework.</li> <li>5. Degrees for writing reports and conducting scientific research in the context of scientific subject vocabulary</li> </ol>					
<b>12. Learning and teaching resources</b>					
<b>Engineering mechanics</b>			Required textbooks (methodology, if any)		
The institute's library for additional curricular resources					
1- Introduction to production engineering Written by – Hassan Hussein Fahmy, Jalal Shawqi (1966) 2- Principles of metal casting Translation – Dr. Salah al-Din Muhammad al-Muhanni 3- Metal forming methods Written by - Dr. Anwar Abdel Wahed (1963). 4- Manufacturing methods Written by - Dr. Arif Abu Safia, Dr. Abdul Razzaq Ismail Khadr			Main references (sources)		

<p>5- Ignition of metals – technological foundations</p> <p>Written by: Abdel Moneim Akef (1977).</p> <p>6- Principles of milling operations</p> <p>Written by – Afrutin, translated by – Muhammad Ab Hamid Al-Rifai</p>	
<p>- Engineering mechanics book</p> <p>All solid scientific journals that are related to broad concept of engineering mechanics</p>	<p>Recommended supporting books and references (scientific journals, reports....)</p>
<p>Websites on the Internet related to mechanical engineering</p>	<p>Electronic references, Internet sites</p>

### Course description form

1. Course Name
<b>Engineering mechanics</b>
2. CodeThe decision

nothing	
3. the chapter /the year	
annual	
4. Date this was preparedthe description	
2/18/2024	
5. aAttendance forms available	
Mandatory weekly attendance	
6. Number of study hours (total)/number of units (total)	
150 hours 1n+2p 3 hoursWeeklyIn 30 weeks	
7. Name of the course administrator(If more than one name is mentioned)	
Name: Dr. Sadiq Hassan Abdel Aziz Email:	
8. Course objectives	
<p>1) <b>The student understands mechanics because it is one of the scientific foundations of technology</b></p> <p>2) <b>He has an important role in achieving solutions to technical problems</b></p> <p><b>Its basic and prominent role in the design of machines, machines, devices and tools</b></p>	Objectives of study subject
9. Teaching and learning strategies	
<ul style="list-style-type: none"> <li>● Providing students with the basics and topics related to previous educational outcomes and the skills to solve practical problems through speech, lecture, or conducting experiments.</li> <li>● Solving a group of practical and applied examples by the subject teacher.</li> <li>● Through discussion, students participate in solving some practical problems.</li> <li>● The department's practical laboratories are monitored by the subject teacher and the department's technical staff.</li> </ul> <p>Asking the student to visit the library and the international informati network (the Internet) to obtain additional knowledge of the acader subjects.</p>	The strategy

10. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Static, fundamental concepts, Force, Scalars and, Vectors, Units, Force polygon, Cartesian Components .	The student's understanding of the material	2n+3A	1
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Analysis of Forces	The student's understanding of the material	2n+3A	2
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Resultant of Concurrent, Coplanar Force system (2-D)	The student's understanding of the material	2n+3A	3
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Moments	The student's understanding of the material	2n+3A	4
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Couples, transformation of the Couple and the force	The student's understanding of the material	2n+3A	5
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Resultant of non-Concurrent, Coplanar	The student's understanding of the material	2n+3A	6

		<b>force system (3-D).</b>	ng of the material		
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Equilibrium, free body diagram (FBD)</b>	The student's understanding of the material	2n+3A	7
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Equilibrium Conditions (2-D)</b>	The student's understanding of the material	2n+3A	8
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Equilibrium Conditions (3-D)</b>	The student's understanding of the material	2n+3A	9
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Friction, Dry Friction</b>	The student's understanding of the material	2n+3A	10
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Center of Gravity, Centroid (length, area), Centroid of Simple area</b>	The student's understanding of the material	2n+3A	11
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Centroids of Composite areas.</b>	The student's understanding of the material	2n+3A	12
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical+practical	<b>Moment of inertia (Simple and Composite areas).</b>	The student's understanding of the material	2n+3A	13

Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>2-Dynamics</b> type of motion, <b>Linear motion with constant speed.</b>	The student's understanding of the material	2n+3A	14
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Linear motion with constant acceleration.</b>	The student's understanding of the material	2n+3A	15
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Newton's Second Law</b>	The student's understanding of the material	2n+3A	16
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Curvilinear motion</b>	The student's understanding of the material	2n+3A	17
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Angular motion, Relative Motion.</b>	The student's understanding of the material	2n+3A	18
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>Work, Energy, Power</b>	The student's understanding of the material	2n+3A	19
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	<b>3-Strength of material: Fundamental concept, Loads, Stress, Strain, Elasticity, Plasticity,</b>	The student's understanding of the material	2n+3A	20

		<b>Deformation</b>			
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture <b>theoretical+practical</b>	<b>Hook's Law, Stress - strain curve, type of stress.</b>	The student's understanding of the material	2n+3A	21
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture <b>theoretical+practical</b>	<b>Normal stress due to an axial load on 1- Uniform cross section area 2- Variable cross section area.</b>	The student's understanding of the material	2n+3A	22
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture <b>theoretical+practical</b>	<b>Shear Stress</b>	The student's understanding of the material	2n+3A	23
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture <b>theoretical+practical</b>	<b>Tensional Stress</b>	The student's understanding of the material	2n+3A	24
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture <b>theoretical+practical</b>	<b>Thermal Stress</b>	The student's understanding of the material	2n+3A	25
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture <b>theoretical+practical</b>	<b>Beams, types of loads, types of beams.</b>	The student's understanding of the material	2n+3A	26
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture <b>theoretical+practical</b>	<b>Shear force (SF) &amp; bending moment</b>	The student's understanding	2n+3A	27

		(BM) of Simple supported beam under an axial load.	ng of the material		
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Shear force (SF) & bending moment (BM) of Simple supported beam under uniform distributed load.	The student's understanding of the material	2n+3A	28
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Shear force (SF) & bending moment (BM) of cantilever beam under an axial load.	The student's understanding of the material	2n+3A	29
Discussion, quick quiz, solve problems, Homework	a lecture theoretical+practical	Shear force (SF) & bending moment (BM) of cantilever beam under uniform distributed load.	The student's understanding of the material	2n+3A	30
11. Course evaluation					
1. First semester exam (theoretical + practical) 2. Second semester exam (theoretical + practical) 3. Sunnah works (10%), taking into account attendance and participation. Final exam (N+A), first round and second round.					
12. Learning and teaching resources					
<b>Engineering mechanics</b>			Required textbooks (methodology, if any)		

The institute's library for additional curricular resources	
<p>Engineering Mechanics Static &amp; dynamics 1- Bed ford &amp; fowler 4th ed 2005.</p> <p>2-Higdon &amp; Stiles Engineering Machine 3rd ed 1968</p> <p>3-Singh, Sadhu Strength of Material 4th ed 2007 9th</p> <p>4- Engineering Mechanics by singer.</p> <p>5-Mechanical engineering Applications, E.John Finnemore &amp; B.Franzini, Tenth Edition</p>	Main references (sources)
<ul style="list-style-type: none"> <li>- Engineering mechanics book</li> <li>- All solid scientific journals that are related to the broad concept of engineering mechanics</li> </ul>	Recommended supporting books and references (scientific journals, reports....)
Websites on the Internet related to mechanical engineering	Electronic references, Internet sites

### Course description form

1. Course Name
<b>Engineering Drawing</b>
2. Code/The decision
nothing
3. the chapter /the year
annual
4. Date this was prepared/the description
5. Attendance forms available

Full attendance					
6. Number of study hours (total)/number of units (total)					
90 hours					
7. Name of the course administrator(If more than one name is mentioned)					
Name: Dr. Ahmed Razzaq Hassan Email:					
8. Course objectives					
<p><b>Providing the student with the necessary skill to read technical drawings, know engineering symbols and terminology, and standard specifications, and draw simple and complex assembly mechanical parts that are most frequently encountered in the student's practical life. By computer using AutoCAD system.</b></p>					<p><b>Objectives of the subject</b></p>
9. Teaching and learning strategies					
<p>1- Providing students with the basics and additional topics related to the course outcomes</p> <p>2- Giving a set of drawings for each topic in the course</p> <p>Showing the steps of computer drawing by drawing one of drawings with the steps and displaying it on the projector</p>					<p><b>The strategy</b></p>
10. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Theoretical and practical exams	Lecture, computer, projector	The importance of engineering drawing	The importance of engineering drawing, the importance of using a computer to implement Engineering	3	<b>the first</b>

			ng drawing, standard drawing board sizes, an overview of the AutoCAD program		
Theoretical and practical exams	Lecture, computer, projector	Using the computer in drawing	Getting ready to draw using Title Blockthe computer	3	<b>the second</b>
Theoretical and practical exams	Lecture, computer, projector	Drawing geometric shapes	Drawing geometric shapes Using computer	3	<b>the third</b>
		Fee adjustments	Graphic modifications, computer drawing aids	6	<b>the fourth And the fifth</b>
Theoretical and practical exams	Lecture, computer, projector	Types of lines for engineering drawing	Types of lines for engineering drawing, engineering operations, dimensional development	9	<b>Sixth, seventh and eighth</b>
Theoretical and practical exams	Lecture, computer, projector	Perspective drawing	Perspective drawing, a perspective drawing containing a circle represented by an ellipse	3	<b>Ninth</b>
Theoretical and practical	Lecture, computer	Projection theory	Projection theory, drawing	6	<b>The tenth and eleventh</b>

al exams	r, projector		Simplified projections.		
Theoretical and practical exams	Lecture, computer, projector	Principal projections and even angles	Principal plots, even angles, drawing according to The theory of the first even angle of projection, drawing according to the theory of the third even angle of projection	12	<b>The twelfth and thirteenth The fourteenth and fifteenth</b>
Theoretical and practical exams	Lecture, computer, projector	Draw the three main projections	Draw the three main projections with even angles and note the difference between them	6	<b>sixteen And the seventeenth</b>
Theoretical and practical exams	Lecture, computer, projector	Conclusion of the third project from the two projects	Conclusion of the third project from the two projects	6	<b>Eighteenth and nineteenth</b>
Theoretical and practical exams	Lecture, computer, projector	Infer perspective from Two or three drops	Inferring perspective from two or three projections.	6	<b>Twenty and twenty-first</b>

Theoretical and practical exams	Lecture, computer, projector	Cutting theory	Cutting theory, shapes And cutting lines by type Material, plotted sections	6	<b>Twenty-second and twenty-third</b>
Theoretical and practical exams	Lecture, computer, projector	Drawing clipped projections	Draw projections cut from One specific hometown	6	<b>the fourth The twenty-fifth</b>
Theoretical and practical exams	Lecture, computer, projector	Partially cropped projection drawing	Partially cropped projection drawing	6	<b>Twenty-sixth and twenty-seventh</b>
Theoretical and practical exams	Lecture, computer, projector	Drawing a half-cut muscat,	Drawing a half-cut projection, drawing winding sections.	9	<b>VIII And the ninth And the twentyAnd the thirty</b>
<b>11. Course evaluation</b>					
<p>1- Daily exams provide a comprehensive exercise for the lesson topic, which requires thinking and the skill of using a computer to solve</p> <p>2- Degrees for participating in solving competitive questions Grades for homework</p>					
<b>12. Learning and teaching resources</b>					
<b>Industrial drawing by Mr. Youssef Al-Radi</b>			Required textbooks (methodology, if any)		
<b><u>Arabic sources</u></b>			Main references (sources)		

<p><b>1- “Engineering Drawing,” by Abd al-Rasul al-Khafaf</b></p> <p><b>2- “Engineering drawing technology”, Libertoyander <u>Foreign sources</u></b></p> <p><b>3- "Fundamental of engineering drawing", Feench and Vierck.</b></p> <p><b>4- "Engineering drawing", S. Bogolyubove N. Voinov</b></p> <p><b>5- "Basic technical drawing", Spencer</b></p>	
International computer magazines	Recommended supporting books and references (scientific journals, reports....)
Websites of solid scientific universities	Electronic references, Internet sites

### Course description form

1. Course Name
Material properties
2. CodeThe decision
nothing
3. the chapter /the year
annual
4. Date this was preparedthe description

2/15/2024					
5. Attendance forms available					
Full attendance					
6. Number of study hours (total)/number of units (total)					
60 hours					
7. Name of the course administrator(If more than one name is mentioned)					
Name: Khalil Fadel Abdel Khader Email:					
8. Course objectives					
Identify metallic and non-metallic engineering materials.				Objectives of the subject	
9. Teaching and learning strategies					
1- lecture 2- Data showdata show Material-specific testing devices, such as tension and compression devices hardness and durability testing devices				The strategy	
10. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Theoretical and practical exams	lecture , Blackboard, projector	Definition of engineering materials	Learn to classify engineering materials and their various properties	2	the first
Theoretical and practical exams	lecture , Blackboard, projector	Atom, element, types of bonds, engineering materials.	Review of firsts Engineering materials	2	the second
Theoretical and practical exams	lecture , Blackboard, projector	Crystalline materials And amorphous.	Learn to classify materials in terms of crystal structure	2	the third
Theoretical and	lecture , Blackboard, projector	Crystal shapes	Learn the types of crystal shapes	2	the fourth

practical exams			and know their properties		
Theoretical and practical exams	lecture , Blackboard, projector	Mechanical properties of materials (stress, strain). , stress-strain curve, ductility, collapse. (	Know some characteristics Mechanical materials	2	Fifth
Theoretical and practical exams	lecture , Blackboard, projector	Hardness, hardness tester.	Learn hardness testing methods	4	Sixth and seventh
Theoretical and practical exams	lecture , Blackboard, projector	Durability, durability tests.	Learn durability testing methods	2	VIII
Theoretical and practical exams	lecture , Blackboard, projector	Thermal properties of materials (Thermal expansion, thermal conductivity)	Learn how to act Exhaust valve on the drawing board	2	Ninth
Theoretical and practical exams	lecture , Blackboard, projector	Electrical properties of materials (ionic materials, insulating materials, materials Metallurgy, factors affecting conductivity. (	Knowledge of Electrical materials	2	The tenth
Theoretical and practical exams	lecture , Blackboard, projector	Magnetic properties of materials) Materials Ferromagnetism, paramagnetic materials, diamagnetic materials, magnetic hysteresis, factors affecting magnetism (	Knowledge of Mechanical materials	2	eleventh
Theoretical and practical exams	lecture , Blackboard, projector	Chemical properties For materials) corrosion, smoothness electrochemical, oxidation (	Knowledge of Chemical materials	2	twelveth
Theoretical and practical exams	lecture , Blackboard, projector	Iron, its most important ores, extraction, blast furnace , transformers.	Learn how Extracting iron and knowing its most important ores	2	Thirteenth
Theoretical and practical exams	lecture ,	Carbon steel, its most important	Know the most important types	2	fourteenth

	Blackboard, projector	types, properties, and uses.	Carbon steel and its uses		
Theoretical and practical exams	lecture , Blackboard, projector	Alloy steel, its most important types, properties, and uses.	Knowing the most important types of alloy steel and their uses	2	Fifteenth
Theoretical and practical exams	lecture , Blackboard, projector	Cast iron, its most important types, properties, and uses.	Knowing the most important types of cast iron and their uses	4	Sixteenth and seventeenth
Theoretical and practical exams	lecture , Blackboard device the offer	Copper, its alloys, properties, uses,	Metal identification Copper, the most important alloy and its properties And its uses	2	eighteen
Theoretical and practical exams	lecture , Blackboard, projector	Aluminum, its alloys, properties, and uses.	Identifying aluminum is the most important metal Alloys, their properties and uses	2	nineteenth
Theoretical and practical exams	lecture , Blackboard, projector	Nickel, its alloys, properties , its uses.	Identify nickel metal, its most important alloys and its properties And its uses	2	The twentieth
Theoretical and practical exams	lecture , Blackboard, projector	Tin, zinc, manganese, alloys, properties, uses	Identify the metal tin, the most important alloys, its properties and uses	2	21st
Theoretical and practical exams	lecture , Blackboard, projector	Other nonferrous alloys: )White metals and bearing alloys. (	Identify white metals and bearing alloys	2	the second And the twenty
Theoretical and practical exams	lecture , Blackboard, projector	Powder metallurgy (Methods of obtaining mineral powders).	Introduction to powder metallurgy	2	the third And the twenty
Theoretical and practical exams	lecture , Blackboard, projector	Powder pressing, sintering process.	Learn about powder pressing and sintering process	2	twenty fourth
Theoretical and practical exams	lecture , Blackboard, projector	Ceramic materials	Knowledge of ceramic materials	2	25th

Theoretical and practical exams	lecture , Blackboard, projector	Glass, its types, manufacture, and uses.	Learn the types of glass and how to make and use it	2	twenty- sixth
Theoretical and practical exams	lecture , Blackboard, projector	Concrete, its industrial uses.	Learn about concrete and its uses	2	27th
Theoretical and practical exams	lecture , Blackboard, projector	Polymers, polymer molecules, types of polymerization.	Knowledge of polymers And types of polymerization	2	VIII And the twenty
Theoretical and practical exams	lecture , Blackboard, projector	Properties and uses of plastics.	Learn the properties of plastics and their uses	4	Ninth Twenty and thirty
<b>11. Course evaluation</b>					
<p>1- Theoretical tests (semester, final and daily exams)</p> <p>2- Practical tests</p> <p>3- Questions during the lecture</p>					
<b>12. Learning and teaching resources</b>					
<b>Properties of materials. Maan Yahya Al-Hamdani, Hashem Kadhim Al-Jawahiri</b>			Required textbooks (methodology, if any)		
<p>1- Principles of metallurgy and materials engineering. F. Billy, translation - Dr. Hussein Baqir, may God have mercy on him</p> <p>2- Engineering metallurgy (applied physical metallurgy) A. Hickens, translation - George Yacoub, Reda Muhammad Ali</p> <p>3- Metals, their structure, properties and thermal coefficients. D.J. Diferol , a. Uliman - Translation - Dr. Jaafar Taher Al-Haidari. Adnan Nehme</p> <p>4- Properties of engineering materials. Dr.. Sabah Amin Karakji, Dr. Walid Muhammad Saleh, Dr. Talib Hussein Al-Sharif</p> <p>5- Engineering materials and their tests. Dr.. Qahtan Khalaf Al-Khazraji, Adel Mahmoud Hussein, Abdel-Jawad Muhammad Sharif</p>			Main references (sources)		

6- Mineral physics. Dr. Abdul Razzaq Ismail Khudair	
International computer magazines	Recommended supporting books and references (scientific journals, reports....)
Websites of solid scientific universities	Electronic references, Internet sites

## Course description form

1. Course Name	
<b>Calculator applications1</b>	
2. CodeThe decision	
nothing	
3. the chapter /the year	
annual	
4. Date this was preparedthe description	
2/15/2024	
5. aAttendance forms available	
Al-Nadhari's presence in the halls and practical presence in the computer laborator	
6. Number of study hours (total)/number of units (total)	
1 hour N + 2 hours E = 3 hours per week	
7. Name of the course administrator(If more than one name is mentioned)	
Name: M. M. Hussein Sabah Hashem Email:	
8. Course objectives	
Identifying the operating system, its importance, the tasks it performs, computer components and accessories, office application programs, connecting to the Internet, and learning about the outside world.	<b>Objectives of the st subject</b>
9. Teaching and learning strategies	
<ol style="list-style-type: none"> <li>1. Explanation, clarification, and use of the blackboard.</li> <li>2. Use modern display devicesData show</li> <li>3. Use of computersAvailable inDepartment computer lab.</li> </ol>	<b>The strategy</b>

10. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture ,Workshop,laboratory, side the job	Operating systems, file management, identifying types of computers.	The student understands computer basics and uses a calculator	3 hours per week (1 theoretical, 2 practical) Total 11 hours.	the first - Fifth
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture ,Workshop,laboratory, side the job	Physical components For the computer, control panel, safe mode and normal mode for the calculator, definition of software for the computer Disk management software	The student understands the hardware components of a computer and uses a calculator	3 hours per week (1 theoretical, 2 practical) Total 11 hours.	VI - The tenth
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture ,Workshop,laboratory, side the job	Recognition office 2013 or 2010 Word processing program ,Word	The student understands computer application programs and uses a calculator	3 hours per week (1 theoretical, 2 practical) Total 11 hours.	eleventh - Fifteenth
oral exams, the exams	lecture ,Workshop,laboratory, side the job	program Excel	The student understands the applied programs	3 hours per week (1 theoretical	sixteenth - twentieth

Written, practical tests quarterly exams, Final exams, evaluation Daily			Microsoft Office uses a calculator	l, 2 practical) Total 11 hours.	
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture, Workshop, laboratory, side the job	Powerpoint program	The student understands the applied programs Microsoft Office uses a calculator	3 hours per week (1 theoretical, 2 practical) Total 11 hours.	Twenty-first - twenty-fifth
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture, Workshop, laboratory, side the job	Living with the Internet, Internet networks, dealing with e-mail, searching for information on the Internet.	The student understands how to deal with the Internet and uses a calculator	3 hours per week (1 theoretical, 2 practical) Total 11 hours.	twenty-sixth - Thirty
<b>11. Course evaluation</b>					
<ol style="list-style-type: none"> <li>Daily oral and written exams</li> <li>ExamsFSolid and final.</li> <li>Marks for participation, questions and discussion of theoretical study topicsAnd the process duringCourse of lectures.</li> <li>Degrees for writing reports and conducting scientific research in the context of scientific subject vocabulary.</li> </ol>					
<b>12. Learning and teaching resources</b>					
				Required textbo (methodology, if any)	
The Internet				Main references (sources)	

Scientific reports on free websites.	Recommended supporting books and references (scientific journals, reports...)
<p>YouTube educational website</p> <p>Free books and research sites, including:</p> <p><a href="https://en.wikipedia.org/wiki/Computer-integrated_manufacturing">https://en.wikipedia.org/wiki/Computer-integrated_manufacturing</a></p> <p><a href="http://files.books.elebda3.net/elebda3.net-7468.pdf">http://files.books.elebda3.net/elebda3.net-7468.pdf</a> <a href="http://download-engineering-pdf-ebooks.com/80-1-library-books">http://download-engineering-pdf-ebooks.com/80-1-library-books</a> <a href="http://download-engineering-pdf-ebooks.com/86-1-library-books">http://download-engineering-pdf-ebooks.com/86-1-library-books</a></p> <p><a href="https://docs.google.com/viewerng/viewer?url=http://files.books.elebda3.net/elebda3.net-6816.pdf&amp;hl=ar">https://docs.google.com/viewerng/viewer?url=http://files.books.elebda3.net/elebda3.net-6816.pdf&amp;hl=ar</a></p> <p><a href="http://www.kemet.co.uk/blog/lapping/how-to-measure-flatness-technical-article">http://www.kemet.co.uk/blog/lapping/how-to-measure-flatness-technical-article</a></p>	Electronic references, Internet sites

### Course description form

1. Course Name
<b>mathematics</b>
2. CodeThe decision
nothing
3. the chapter /the year
annual
4. Date this was preparedthe description
2/18/2024
5. aAttendance forms available
Full attendance
6. Number of study hours (total)/number of units (total)
2 hours a week 60 hours
7. Name of the course administrator(If more than one name is mentioned)
Name: M.M. Ahmed Abdel Mohsen Abdel Sahib Email:
8. Course objectives

<p><b>Graduating a cadre capable of working in the fields of manufacturing, finding and mathematically designing the dimensions of the part required to be produced in workshops and laboratories, and preparing it to contribute to the following work:</b></p> <ol style="list-style-type: none"> <li>1. <b>Ability</b> On the use of mathematics in other scientific subjects.</li> <li>2. <b>The ability to think logically when solving exercises.</b></li> <li>3. <b>The ability to develop and how to link data with information to obtain a solution to the problem</b></li> </ol>	<p><b>Objectives of the subject</b></p>
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**9. Teaching and learning strategies**

<ol style="list-style-type: none"> <li>1- Explanation and clarification</li> <li>2- Display models and illustrations</li> <li>3- Use modern display devices</li> <li>4- Lecture method</li> </ol>	<p><b>The strategy</b></p>
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**10. Course structure**

<b>Evaluation method</b>	<b>Learning method</b>	<b>Name of the unit or topic</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>the week</b>
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Determinants and their properties, solving simultaneous equations using the determinant method (Cramer).	The student's understanding of the material	2 hours a week	the first and the second

Oral exams the exams Editorial Practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Differentiation, algebra of derivatives, multiple functions	The student's understanding of the material	2 hours a week	The third, fourth and fifth
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Trigonometric and logarithmic functions The exponential, its derivatives, implicit functions, and the chain rule.	The student's understanding of the material	2 hours a week	Sixth, seventh and eighth
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Drawing functions, drawing trigonometric functions and maximum and minimum limits.	The student's understanding of the material	2 hours a week	The ninth, tenth and eleventh
oral exams, the exams Written, practical tests quarterly exams,	lecture data show the blackboard	Applications of physical differentiation, velocity and acceleration, and engineering applications of differentiation.	The student's understanding of the material	2 hours a week	Twelfth and thirteenth

Final exams, evaluation Daily					
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Integration, laws, and its relationship to differentiation, definite and indefinite integration.	The student's understanding of the material	2 hours a week	Fourteenth and fifteenth
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Implicit integration, geometric applications of integration (areas and volumes) and physics	The student's understanding of the material	2 hours a week	Sixth, seventh, eighth and nineteenth
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Vocabulary details	The student's understanding of the material	2 hours a week	Twenty and twenty-first
oral exams, the exams Written, practical tests	lecture data show the blackboard	General methods of integration include substitution and partial integration and the use of	The student's understanding of the material	2 hours a week	The third, fourth, fifth, and twenty-sixth

quarterly exams, Final exams, evaluation Daily		exponential and logarithmic partial fractions.			
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Discrete, homogeneous and linear differential equations with their various applications.	The student's understanding of the material	2 hours a week	Twenty-seventh and twenty-eighth
oral exams, the exams Written, practical tests quarterly exams, Final exams, evaluation Daily	lecture data show the blackboard	Vectors (direct and quantitative multiplication and calculating angles between vectors.	The student's understanding of the material	2 hours a week	Twenty-nine and thirty-nine
<b>11. Course evaluation</b>					
1- Theoretical tests (semester and final exams).And daily( 2- Practical tests 3- Questions during the lecture					
<b>12. Learning and teaching resources</b>					
			Required textbooks (methodology, if any)		
			Main references (sources)		
			Recommended supporting books and references (scientific journals, reports....)		
			Electronic references, Internet sites		

## Course description form

<b>1. Course Name</b>	
Human rights and democracy	
<b>2. Code</b> The decision	
nothing	
<b>3. the chapter /the year</b>	
annual	
<b>4. Date this was prepared</b> the description	
2/19/2024	
<b>5. a</b> Attendance forms available	
Full attendance	
<b>6. Number of study hours (total)/number of units (total)</b>	
2 hours Weekly 60 hours	
<b>7. Name of the course administrator</b> (If more than one name is mentioned)	
Name: Email:	
<b>8. Course objectives</b>	
<p><b>-The student should be able to recognize the principles and values of human rights, introduce them, and educate generations to respect and adhere to them</b></p> <p><b>2-Learn about public freedoms and what these freedoms are in their details.</b></p> <p><b>3-The student learns about continuous awareness of human rights and the fundamental freedoms associated with them.</b></p> <p><b>4-He fights everything that aims to ignore it, harm it, or undermine its sanctity</b></p> <p><b>5-Learn about the concept of democracy and its relationship to public freedoms.</b></p>	<p><b>Objectives of study subject</b></p>
<b>9. Teaching and learning strategies</b>	
<p><b>1- Explanation and clarification</b></p> <p><b>2- Use of current display devices</b></p> <p><b>3-Lecture route</b></p>	<p><b>The strategy</b></p>
<b>10. Course structure</b>	

<b>Evaluation method</b>	<b>Learning method</b>	<b>Name of the unit or topic</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>the week</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Human rights – their definition – their goals Human rights in ancient civilizations, especially the Mesopotamian civilization</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>1</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Human rights in divine laws, with a focus on human rights in Islam</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>2</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Human rights in contemporary and modern history – international recognition of human rights since World War I and the League/United Nations</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>3</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Regional recognition of human rights, European Convention on Human Rights0591American agreement 1</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>4</b>
<b>Oral exams, written exams,</b>	lecture	<b>Non-governmental organizations and human rights)</b>	The student learns about human rights	<b>2 hours of</b>	<b>5</b>

and semester exams ,Final exams,Evaluation Daily		International Committee of the Red Cross – Amnesty International – Human Rights Watch – National Human Rights Organizations <sup>1</sup>		sunshine per week	
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture	Human rights in Iraqi constitutions between theory and reality <sup>1</sup>	The student learns about human rights	2 hours of sunshine per week	6
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture	The relationship between human rights and civil freedoms: 0–In the Universal Declaration of Human Rights <sup>1</sup> 2–In regional charters and national constitutions 1	The student learns about human rights	2 hours of sunshine per week	7
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture	Economic, social and cultural human rights and civil and political human rights <sup>1</sup>	The student learns about human rights	2 hours of sunshine per week	8
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture	Modern human rights: facts in development – the right to a clean environment – the right to solidarity – the right to religion	The student learns about human rights	2 hours of sunshine per week	9

<p><b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b></p>	<p>lecture</p>	<p><b>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</b></p> <p><b>Guarantees in constitutional oversight – guarantees in Freedom of the press and public opinion – the role of non-governmental organizations in respecting and protecting human rights1</b></p>	<p>The student learns about human rights</p>	<p><b>2 hours of sunshine per week</b></p>	<p><b>10</b></p>
<p><b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b></p>	<p>lecture</p>	<p><b>Guarantees, respect and protection of human rights at the international level:</b></p> <ul style="list-style-type: none"> <li>- The role of the United Nations and its specialized agencies in providing guarantees</li> <li>- The role of regional organizations (the Arab League – the European Union – the European African – Organization of American States – ASEAN1</li> </ul>	<p>The student learns about human rights</p>	<p><b>2 hours of sunshine per week</b></p>	<p><b>11</b></p>

		-The role of international, regional non-governmental organizations and public opinion in respecting and protecting human rights			
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture	The general theory of freedoms: the origin of rights and freedoms – The project’s position on the declared rights and freedoms – Use of the term public freedoms1	The student learns about human rights	2 hours of sunshine per week	12
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture	The legal rule of the state of law	The student learns about human rights	2 hours of sunshine per week	13
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture	Regulation of public freedoms by public authorities	The student learns about human rights	2 hours of sunshine per week	14
Oral exams, written exams, and semester exams ,Final exams,Evaluation on	lecture	Equality: The historical development of the concept of equality The modern development of the idea of equality - gender equality1	The student learns about human rights	2 hours of sunshine per week	15

<b>Daily</b>		<b>- Equality between individuals according to their beliefs And their element1</b>			
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Democracy. Its definition. Its types</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>16</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Concepts of democracy</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>17</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Democracy in the Third World</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>18</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Democratic systems in the world</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>19</b>
<b>Oral exams, written exams, and semester exams</b>	lecture	<b>The concept of freedoms, classification of public freedoms</b>	The student learns about human rights	<b>2 hours of sunshine</b>	<b>20</b>

<b>,Final exams,Evaluation Daily</b>				<b>e per week</b>	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Fundamental freedoms, intellectual freedoms, economic and social freedoms</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>21</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Freedom of security and feeling of reassurance, freedom of coming and going</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>22</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Freedom of education</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>23</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Freedom of the press Freedom of assembly</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>24</b>
<b>Oral exams, written exams, and semester exams</b>	lecture	<b>Freedom of association</b>	The student learns about human rights	<b>2 hours of sunshine</b>	<b>25</b>

<b>,Final exams,Evaluation Daily</b>		<b>freedom in the job</b>		<b>e per week</b>	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>The right to own property</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>26</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Freedom of trade and industry</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>27</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>women freedom</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>28</b>
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture	<b>Political parties and public freedoms</b>	The student learns about human rights	<b>2 hours of sunshine per week</b>	<b>29</b>
<b>Oral exams, written exams, and semester exams</b>	lecture	<b>Scientific and technical progress and public freedoms</b>	The student learns about human rights	<b>2 hours of sunshine</b>	<b>30</b>

<b>,Final exams,Evaluation on Daily</b>				<b>e per week</b>	
<b>11. Course evaluation</b>					
<b>1 Daily oral and written exams</b> <b>2 Pray exams and final</b> <b>3 Grades for the participant, questions, and discussion of topics related to the topics</b> <b>4 Grades for homework</b>					
<b>12. Learning and teaching resources</b>					
<b>Human rights and democracy</b>			Required textbooks (methodology, if any)		
<b>Human Rights &amp; Democratic</b>					
<b>Books on human rights and democracy</b>			Main references (sources)		
<b>Scientific reports on free websites, books on human rights</b>			Recommended supporting books and references (scientific journals, reports....)		
			Electronic references, Internet sites		

### Course description form

<b>1. Course Name</b>
<b>Electrical technology</b>
<b>2. Code</b> The decision
nothing
<b>3. the chapter /the year</b>
annual
<b>4. Date this was prepared</b> the description
2/18/2024
<b>5. a</b> Attendance forms available
Full attendance
<b>6. Number of study hours (total)/number of units (total)</b>
3 hours Weekly 1n+2p

90 hours					
7. Name of the course administrator(If more than one name is mentioned)					
Name: Hani Kani Jaber Email:					
8. Course objectives					
<b>Graduating a cadre capable of working in the fields of electricity and preparing to contribute to the following work:</b> <b>1- Ability to analyze electrical circuits.</b> <b>2- Connecting electrical circuits.</b> <b>3- Conduct laboratory calculations and measurements of electrical circuits and compare them with theoretical results.</b> <b>4- Access to electric motors and transformers and the possibility of performing their calculations.</b> <b>Learn about electrical circuit protection devices, how to use them, and how they work</b>					Objectives of study subject
9. Teaching and learning strategies					
1. Explanation and clarification 2. Display models and illustrations 3. Use Projector the talk 4. Lecture route Use Devices and tools Available in Laboratories and workshops					The strategies
10. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Oral exams, written exams,	lecture- Workshop- laboratory-	Casting units	The student's	1 hour	visu

and semester exams ,Final exams,Evaluation Daily	The practical side		understanding of the material	1 + 2 hours practical	
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture– Workshop– laboratory– The practical side	Ohm's law	The student's understanding of the material	1 hour visual + 2 hours practical	
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture– Workshop– laboratory– The practical side	Connect series and parallel	The student's understanding of the material	1 hour visual + 2 hours practical	
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture– Workshop– laboratory– The practical side	Alternating current	The student's understanding of the material	1 hour visual + 2 hours practical	
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture– Workshop– laboratory– The practical side	Effective value of current and voltage	The student's understanding of the material	1 hour visual + 2 hours	

				practical	
<b>Oral exams, written exams, and semester exams</b> <b>,Final exams,Evaluation</b> <b>Daily oral tests, written tests, and quarterly exams</b> <b>,Final exams,Evaluation</b> <b>Daily</b>	lecture– Workshop– laboratory– The practical side	Years of ability	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams</b> <b>,Final exams,Evaluation</b> <b>Daily</b>	lecture– Workshop– laboratory– The practical side	Electromagnetism	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams</b> <b>,Final exams,Evaluation</b> <b>Daily</b>	lecture– Workshop– laboratory– The practical side	the magnetic field	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams</b> <b>,Final exams,Evaluation</b> <b>Daily</b>	lecture– Workshop– laboratory– The practical side	Alternating current	The student's understanding of the material	1 hour visual + 2 hours	

				practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop-laboratory– The practical side	Connect the star	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop-laboratory– The practical side	Connect delta	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop-laboratory– The practical side	AC motor	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop-laboratory– The practical side	The working principle of the electric motor	The student's understanding of the material	1 hour visual + 2 hours practical	

<b>Oral exams, written exams, and semester exams</b> <b>,Final exams,Evaluation</b> <b>Daily</b>	lecture– Workshop– laboratory– The practical side	Methods of transmitting movement in induction motors	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams</b> <b>,Final exams,Evaluation</b> <b>Daily</b>	lecture– Workshop– laboratory– The practical side	Control and control in Speed Induction motors	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams</b> <b>,Final exams,Evaluation</b> <b>Daily</b>	lecture– Workshop– laboratory– The practical side	Single-phase AC motors	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams</b> <b>,Final exams,Evaluation</b> <b>Daily</b>	lecture– Workshop– laboratory– The practical side	Single AC motors Capacitor apogee	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams</b>	lecture– Workshop– laboratory–	Prism motors	The student's understanding of	1 hour visual +	

<b>,Final exams,Evaluation Daily</b>	The practical side		the material	2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop– laboratory– The practical side	Protection and protection of engines	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop– laboratory– The practical side	Course quotientCB	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop– laboratory– The practical side	Giving to engines	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop– laboratory– The practical side	It roseAEngine temperature	The student's understanding of the material	1 hour visual + 2 hours	

				practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop-laboratory– The practical side	The origin of giving	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop-laboratory– The practical side	Tightening engines manually and automatically	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop-laboratory– The practical side	Engine safety and durability	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily</b>	lecture– Workshop-laboratory– The practical side	Sustaining the engines	The student's understanding of the material	1 hour visual + 2 hours practical	
<b>Oral exams, written exams,</b>	lecture– Workshop	TuberculosisProfessional job	The student's	1 hour	

and semester exams ,Final exams,Evaluation Daily	p-laboratory–The practical side		understanding of the material	visual + 2 hours practical	
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture– Workshop-p-laboratory–The practical side	Professional integrity	The student's understanding of the material	1 hour visual + 2 hours practical	
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture– Workshop-laboratory–The practical side	Professional integrity	The student's understanding of the material	1 hour visual + 2 hours practical	
Oral exams, written exams, and semester exams ,Final exams,Evaluation Daily	lecture– Workshop-laboratory–The practical side	Professional integrity	The student's understanding of the material	1 hour visual + 2 hours practical	
11. Course evaluation					
1. ExamsDaily oral and written					
2. ExamsSemester and final.					

<p>3. grades For the participant, questions and discussion of topics Theoretical and practical studies During the course of lectures.</p> <p>4. Grades for homework.</p> <p>5. Degrees about Report book And conduct research Scientific in Context of scientific subject vocabulary</p>	
12. Learning and teaching resources	
Electrical technology and	Required textbo (methodology, if any)
<p>1-Electrical Technology by – Theraga</p> <p>2- Electrical Technology by – Hughes</p> <p>3- Electrical Technology by – Erick</p>	Main references (source
<p>Electrical basics books</p> <p>Books on engines and electrical machines</p> <p>Scientific reports on free websites</p>	Recommended supporting books and references (scientific journals, reports....)
<p style="text-align: center;"><b>The YouTube educational website includes free books and research sites</b></p> <p><a href="http://www.kutub.info/library/category/13h">http://www.kutub.info/library/category/13h</a><a href="https://en.wikipedia.org/wiki/Electricity">https://en.wikipedia.org/wiki/Electricity</a><a href="https://simple.wikipedia.org/wiki/Electricity">https://simple.wikipedia.org/wiki/Electricity</a><a href="http://science.howstuffworks.com/electricity.htm">http://science.howstuffworks.com/electricity.htm</a></p>	Electronic referenc Internet sites

### Course description form

1. Course Name
<b>Factor/1</b>
2. Code
The decision nothing
3. the chapter /the year
annual

4. Date this was prepared the description					
2/15/2024					
5. Attendance forms available					
Full attendance weekly					
6. Number of study hours (total)/number of units (total)					
8 hours Weekly 240 hours					
7. Name of the course administrator (If more than one name is mentioned)					
Name: Khalil Fadel Abdel Khader Email:					
8. Course objectives					
Objective of the course: Acquiring the manual skill to carry out operating and manufacturing operations using various hand tools and measuring tools and the ability to work and operate operating machines in the optimal production method.					Objectives of the subject
9. Teaching and learning strategies					
1. Explanation and clarification 2. Display models and illustrations 3. Lecture route 4. Use Devices and tools Available in the workshops					The strategy
10. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Oral exams	Practical exercises	1- Model carpentry (3 weeks) 1- The basic principles of model carpentry, definition of	Student understanding of the exercise	8 hours per week	the first

		<p>wood types and their uses, types of models and their carpentry and their uses in plumbing.</p> <p>2- Correcting the model, the conditions that must be met in correcting the model, the shrinkage factor, an exercise on executive drawing of simple models with one separator term and without a box.</p> <p>3- The equipment used, the hand tools and the mechanical equipment used, the</p>			
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		thickening machine, the tray saw, the band saw, the raking machine, the sanding machine, the converter. 4- Practical training for cutting parts according to the operational drawing on the marks.			
Oral exams	Practical exercises	Completing the training, finishing the parts of the model, methods of assembling it, and its final dimensions.	Student understanding of the exercise	8 working hours	<b>the second</b>
Oral exams	Practical exercises	Complex models: explanation of multiple dividing boundaries and internal spaces.	Student understanding of the exercise	8 working hours	<b>the third</b>
<b>2- Metal Plumbing (6 weeks)</b>					
Oral exams	Practical exercises	Metal casting and its importance, the purpose of using castings in industry,	Student understanding of the exercise	8 working hours	<b>the first</b>

		<p>contents of the casting unit, industrial safety precautions in casting, forming a sand mold for a one-piece model in front of students, sand for molds and cores, their types and sources, properties of additives, mixing processes and controlling amounts, use of a sand mixer, sand treatment.</p> <p>Forming sand molds using manual methods for a one-piece model to form a sand mould.</p>			
Oral exams	Practical exercises	<p>Sand mold for a one-piece model with identification of castings and risers, melting metal and pouring it into a mould, extracting and cleaning the castings.</p>	Student understanding of the exercise	8 working hours	<b>the second</b>
Oral exams	Practical exercises	<p>Forming a sand mold as before, melting the</p>	Student understanding	8 working hours	<b>the third</b>

		metal, pouring it into a mold, taking out the casting and cleaning it.	g of the exercise		
Oral exams	Practical exercises	Casting sand molds in a productive manner, training on the use of plumbing plates that contain more than one piece in one mold and with cores, methods of cleaning castings with brushes, files, grinding stones, steel balls, compressed air, rotating machines, reviewing and examining castings, identifying visible defects and their causes, Review the dimensions of the castings, and ensure that they match the required dimensions.	Student understanding of the exercise	8 working hours	<b>the fourth</b>
Oral exams	Practical exercises	Casting sand molds for moving and	Student understanding of the exercise	8 working hours	<b>Fifth</b>

		compound models with a core. These exercises are among the exercises that the student will perform to complete their operation in other laboratories.			
Oral exams	Practical exercises	Metal smelting furnaces, their types, characteristics, uses, rotary, stirrer, and stationary furnaces.	Student understanding of the exercise	8 working hours	<b>VI</b>
<b>-Refrigeration and maintenance (6 weeks)</b>					
Oral exams	Practical exercises	1- Industrial development and the role of the refrigerator in it. 2- Vernier foot, its types, methods of measuring it, how to make a vernier that reads the height scale with depths,	Student understanding of the exercise	8 working hours	<b>the first</b>

		<p>and the calipers.</p> <p>3- Shankara process</p> <p>Base surfaces, tools used, display materials, impact fork, justice calipers, chink calipers, tailbone and tailbone, right angle, chink flowers, regular and sensitive chinks, altimeter, universal protractor and angle measurement , a practical exercise that combines chinking operations.</p> <p>4- Files and cold process</p> <p>Types of files and their specifications, components and their types, and</p>			
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		methods of attaching the crafts and their work.			
Oral exams	Practical exercises	Uses of files, how to clean files, the process of filing, practice on the hook and the simple file. Chainsaw cutting Hand saw, saw weapon, installing the saw weapon, conditions that must be met in sawing, training on the saw cutting process.	Student understanding of the exercise	8 working hours	<b>the second</b>
Oral exams	Practical exercises	-Gerification process Types of embryos, age and maintenance of embryos, types of manual hammer heads, method of installing the hammer head, exercise on	Student understanding of the exercise	8 working hours	<b>the third</b>

		<p>the embryo process.</p> <p>2-The process of drilling and glazing</p> <p>Types of drills, types of primers, types of reamers, how to perform the drilling and grinding process, training on manual and mechanical drilling and grinding operations after performing the shredding operations.</p> <p>3-Al-Qalawz</p> <p>Types of screws, internal and external dental tables, training on performing different screwing operations.</p>			
Oral exams	Practical exercises	Various training exercises on the previously mentioned filing work.	Student understanding of the exercise	8 working hours	<b>the fourth</b>

Oral exams	Practical exercises	The importance of maintenance for machines and equipment, clarification of periodic and comprehensive maintenance operations, and how to prepare maintenance reports.	Student understanding of the exercise	8 working hours	<b>Fifth</b>
Oral exams	Practical exercises	1- Types of gaskets and sealants, their uses, methods of installing and removing them, and reviewing their operation 2- Types of valves, methods of operation, inspection and repair	Student understanding of the exercise	8 working hours	<b>VI</b>
<b>-Welding (6 weeks)</b>					
Oral exams	Practical exercises	Occupational safety and security precautions: gas welding, the equipment used and how to install and adjust it, other auxiliary tools and gases used and their specifications, welding wires, their types and measurements, other auxiliary	Student understanding of the exercise	8 working hours	<b>the first</b>

		materials, welding equipment, types of flames and the method of igniting and adjusting the required flame, artifacts, rinsing and cleaning the edges to be welded.			
Oral exams	Practical exercises	Practical exercises: Welding opposite surfaces, perpendicular surfaces, inclined surfaces, circle welding, longitudinal and transverse cutting		8 working hours	<b>the second</b>
Oral exams	Practical exercises	Welding equipment, practical training on using the electric arc to weld various surfaces, equipment used, electrodes and how to install them, practical training.	Student understanding of the exercise	8 working hours	<b>the third</b>
Oral exams	Practical exercises	Gas welding CO <sub>2</sub> Gas cutting operations, equipment used and precautions that must be available Doing exercises on welding items using gas CO <sub>2</sub>	Student understanding of the exercise	8 working hours	<b>the fourth</b>
Oral exams	Practical exercises	Training in gas-shielded arc welding operations (Tig, mig)	Student understanding of the exercise	8 working hours	<b>Fifth</b>
Oral exams	Practical exercises	Assembly exercises using various	Student understanding of the exercise	8 working hours	<b>VI</b>

		cutting and welding processes.			
<b>5-Plumbing and blacksmithing (3 weeks)</b>					
Oral exams	Practical exercises	Equipment for cutting and bending billets, rolling machine, grooving machine and hand tools, using and bending the billet manually, regular thruster, list and drawing method, simple discretizations, calculating the individual cut and missing actuators.	Student understanding of the exercise	8 working hours	<b>the first</b>
Oral exams	Practical exercises	Training on calculating the individual intersecting works, performing an exercise for two intersecting cylinders.	Student understanding of the exercise	8 working hours	<b>the second</b>
Oral exams	Practical exercises	Singular cones and conic ellipses.	Student understanding of the exercise	8 working hours	<b>the third</b>
<b>-Lathing (6 weeks)</b>					
Oral exams	Practical exercises	The lathe, its specifications, uses, accessories, installation methods, operating the lathe, types of lathe pens using each of them.	Student understanding of the exercise	8 working hours	<b>the first</b>

Oral exams	Practical exercises	Lathing operations: Plane lathe, tool, center work, simple step drill, use of measuring tools.	Student understanding of the exercise	8 working hours	the second
Oral exams	Practical exercises	Mapping the external looting in different ways, explaining the laws for each method, and doing an exercise specifically for the external looting.	Student understanding of the exercise	8 working hours	the third

### 11. Course evaluation

**The evaluation is done on the basis of:**

- 1- Attendance at the lecture–Participation or discussion in the lesson
- 2- Tests taken from the lecture
- 3- Providing scientific reports on the subject’s courses, specifically related to the topic of the lecture
- 4- Making small projects

### 12. Learning and teaching resources

	Required textbooks (methodology, if any)
	Main references (sources)
	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

## Course description form

1. Course Name
2. CodeThe decision
3. the chapter /the year





	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites

### Course description form

1. Course Name	
<b>Machine parts technologies</b>	
2. Code	
The decision nothing	
3. the chapter /the year	
annual	
4. Date this was prepared	
the description 2/20/2024	
5. Attendance forms available	
Mandatory weekly attendance	
6. Number of study hours (total)/number of units (total)	
90 hours	
7. Name of the course administrator(If more than one name is mentioned)	
Name: Khalil Fadel Abdel Khader Email:	
8. Course objectives	
<p>1) <b>Explain the role of mechanical parts in the machine system.</b></p> <p>2) <b>The relationship that links these parts together.</b></p> <p><b>3- How to perform some calculations to design these parts and determine all the factors affecting them.</b></p>	Objectives of the subject
9. Teaching and learning strategies	

<ul style="list-style-type: none"> <li>● Providing students with the basics and topics related to previous educational outcomes and the skills to solve practical problems through speech, lecture, or conducting experiments.</li> <li>● Solving a group of practical and applied examples by the subject teacher.</li> <li>● Through discussion, students participate in solving some practical problems.</li> <li>● Asking the student to visit the library and the international information network (the Internet) to obtain additional knowledge of the academic subjects and to observe, maintain, and repair the machines in the machine shop at the institute.</li> </ul>	<b>The strategy</b>
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10. Course structure

<b>Evaluation method</b>	<b>Learning method</b>	<b>Name of the unit or topic</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>the week</b>
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture <b>theoretical</b>	Review of Strength of Materials.	The student's understanding of the material	3n	1
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Riveted Joints. Types of Riveted Joints, Design of Riveted Joints, Efficiency of Riveted Joints	The student's understanding of the material	=	2-3

<b>Discussion, quick quiz, solve problems, Homework</b>	=	Welded Joints Types of welding Joints ,Design of welding Joints	The student's understanding of the material	=	4-5
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Screwed Joints, Design of Bolts for Fastening, Design of Bolts for Power Transition	The student's understanding of the material	=	6-7
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Keyed Joints, Types of Key, Design of Sunk Key	The student's understanding of the material	=	8-9
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Frictional Clutches, Type of Frictional Clutches, Design of Frictional Clutches.	The student's understanding of the material	=	10-11
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Types of Springs, Design of Springs.	The student's understanding of the material	=	12-13
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Types of Belts,	The student's understanding of the material	=	14-15

		Design of Belts.			
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Design of Shafts.	The student's understanding of the material	=	16-17
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Design of Journal Bearings.	The student's understanding of the material	=	18-19
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Selection of Ball Bearings.	The student's understanding of the material	=	20
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Design of Gears by Lewis Equation.	The student's understanding of the material	=	21-22
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Gears Trains.	The student's understanding of the material	=	23-24
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Design of Simple Gears Box.	The student's understanding of the material	=	25-26
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Worm Gears.	The student's understanding of the material	=	27-28
<b>Discussion, quick quiz, solve problems, Homework</b>	=	Cams.	The student's understanding of the material	=	29
<b>Discussion, quick quiz, solve problems, Homework</b>	a lecture theoretical	Review of Strength of Materials.	The student's understanding of the material	3n	30
11. Course evaluation					

<ul style="list-style-type: none"> <li>● Evaluating students individually by giving them an opportunity to participate in the class by answering questions.</li> <li>● Students are evaluated collectively through daily exams with practical and theoretical questions.</li> <li>● Assessing students collectively by giving extracurricular assignments such as writing special reports or those that... Concerning machine parts.</li> <li>● Exams at the end of the first semester (mid-year), the second semester, and the final exams for the first and second semester</li> </ul>	
12. Learning and teaching resources	
<p><b>Production engineering(Arab)</b> The institute's library for additional curricula resources.</p>	Required textbooks (methodology any)
<p>1-Strength of Material by Ferdinal L. Singer 2-Strength of Materials by RSKhurmi. 3-Machine Design by RS Khurmi, JK Gupta 4-Machine Design by Paul H.Black. 5- Schaums Outline Series of Machine Design by Hall, Holowenko, Laughin</p>	Main references (sources)
<p>- All solid scientific journals that are related to the broad concept <b>For design</b></p>	Recommended supporting books and references (scientific journals, reports....)
Websites on the Internet related to mechanical engineering	Electronic references, Internet sites

### Course description form

1. Course Name
<b>Minerals</b>
2. CodeThe decision

nothing	
3. the chapter /the year	
annual	
4. Date this was preparedthe description	
2/21/2024	
5. aAttendance forms available	
Mandatory weekly attendance	
6. Number of study hours (total)/number of units (total)	
120 hours 2 practical + 2 visual	
7. Name of the course administrator(If more than one name is mentioned)	
Name: M.M. Mujahid Karim Okla Email:	
8. Course objectives	
<b>1) The student understands mineralogy</b> <b>2) It has an important role in selecting engineering materials</b> <b>3- Its basic and prominent role in designing machines, machines, devices and tools</b>	<b>Objectives of study subject</b>
9. Teaching and learning strategies	
<ul style="list-style-type: none"> <li>● Providing students with the basics and topics related to previous educational outcomes and the skills to solve practical problems through speech, lecture, or conducting experiments.</li> <li>● Solving a group of practical and applied examples by the subject teacher.</li> <li>● Through discussion, students participate in solving some practical problems.</li> <li>● The department's practical laboratories are monitored by the subject teacher and the department's technical staff.</li> <li>● Asking the student to visit the library and the international information network (the Internet) to obtain additional knowledge of the academic subjects.</li> </ul>	<b>The strategy</b>

10. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Discussion, quick quiz, solve problems, Home work	a lecture theoretical+practical	Introduction to mineralogy, crystallization, chimeric crystallization, and the effect of cooling rate on the structure of minerals. Introduction to the metallurgy laboratory (resistance laboratory, heat treatment laboratory, microscopic examination and sample preparation laboratory, imaging laboratory)	The student's understanding of the material	2n+2A	1
Discussion, quick quiz, solve problems, Home work	a lecture theoretical+practical	Installation of metal blocks (solidification of castings) Common defects in castings. Simple tension experiment, elongation curve, stress-strain curve, elastic and plastic formation, modulus of elasticity,	The student's understanding of the material	2n+2A	2

		maximum tensile strength (UTS) relative elongation, decrease in cross-sectional area.			
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical + practical	Atomic crowding coefficient, crystallographic directions, crystallographic levels, the phenomenon of rooting. Compression experiment, load curve, elongation, stress-strain curve, length relationship with cross-sectional area, factors affecting the compression experiment.	The student's understanding of the material	2n+ 2A	3
<b>Discussion, quick quiz, solve problems, Homework</b>	Theoretical + practical lecture	Crystal lattice defects, linear raster. Hardness test, Pernel method.	The student's understanding of the material	2n+ 2A	4
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical + practical	Flexible forming and plastic forming (slippage, twinning). Hardness test, Vickers method.	The student's understanding of the material	2n+ 2A	5
<b>Discussion, quick quiz, solve</b>	a lecture theoretical + practical	Strain hardening, cold forming, hot	The student's understanding	2n+ 2A	6

problems,Home work		forming. Hardness test, Rockwell method -B-.	ng of the material		
Discussion, quick quiz, solve problems,Home work	a lecturetheoretical+practical	Recovery, recrystallization, crystal growth, hardness test, Rockwell method -C-.	The student's understanding of the material	2n+2A	7
Discussion, quick quiz, solve problems,Home work	a lecturetheoretical+practical	Stress and strain curves in bending, stretching, fracture, types of fracture, movement from ductile to brittle fracture. Fatigue test.	The student's understanding of the material	2n+2A	8
Discussion, quick quiz, solve problems,Home work	a lecturetheoretical+practical	Fatigue, fatigue mechanism, factors affecting the fatigue limit, fatigue-resistant materials. Creep test. Shock test (Izod - Charpy). Preparing samples for microscopic examination (smoothing, polishing, display, examination under a microscope)	The student's understanding of the material	2n+2A	9
Discussion, quick quiz, solve problems,Home work	a lecturetheoretical+practical	Creep, creep mechanism, creep-resistant materials.	The student's understanding	2n+2A	10

			ng of the material		
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture <b>theoretical+practical</b>	Compound, phase, solid solution, system, equilibrium, alloy formation, mechanical mixture, eutectics.	The student's understanding of the material	2n+ 2A	11
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture <b>theoretical+practical</b>	Thermal equilibrium diagram for a binary system that is completely dissolved in the liquid and solid states. Thermal equilibrium diagram for a binary system that is completely dissolved in the liquid state and undissolved in the solid state (eutectics).	The student's understanding of the material	2n+ 2A	12
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture <b>theoretical+practical</b>	Thermal equilibrium diagram for a binary system with complete solvation in	The student's understanding of the material	2n+ 2A	13

		the liquid state and limited solvation in the solid state.			
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical + practical	Thermal equilibrium diagram for a binary system that is completely dissolved in the liquid state and forms a chemical compound when frozen.	The student's understanding of the material	2n+ 2A	14
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical + practical	Iron, dissolution of carbon in iron, heat equilibrium diagram for the iron/carbon system, the most important reactions included in the diagram.	The student's understanding of the material	2n+ 2A	15
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical + practical	Completion of the heat equilibrium diagram for the iron/carbon system.	The student's understanding of the material	2n+ 2A	16

<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical+practical	Austenite formation, mechanism of converting pearlite to austenite.	The student's understanding of the material	2n+ 2A	17
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical+practical	Austenite transformations with constant temperature and transformations by continuous cooling.	The student's understanding of the material	2n+ 2A	18
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical+practical	Thermal treatments (annealing, equalization, standardization)	The student's understanding of the material	2n+ 2A	19
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical+practical	Completion of thermal coefficients (standardization and revision), sub-zero thermal coefficients, aging.	The student's understanding of the material	2n+ 2A	20
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecture theoretical+practical	Surface hardening (carburization of all types and the thermal treatments that follow it)	The student's understanding of the material	2n+ 2A	21

		Al-Tahwa, Al-Sanida.			
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecturetheoretical+practical	Alloy steel, the effect of alloying elements on the properties of steel.	The student's understanding of the material	2n+ 2A	22
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecturetheoretical+practical	Stainless steel, tool steel.	The student's understanding of the material	2n+ 2A	23
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecturetheoretical+practical	Cast iron production and its heat treatments.	The student's understanding of the material	2n+ 2A	24
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecturetheoretical+practical	Supplementing the production of cast iron and its most important types.	The student's understanding of the material	2n+ 2A	25
<b>Discussion, quick quiz, solve problems, Home work</b>	a lecturetheoretical+practical	Definition of corrosion, direct and indirect economic costs of corrosion, manifestations of corrosion, mechanism of corrosion.	The student's understanding of the material	2n+ 2A	26

Discussion, quick quiz, solve problems, Home work	a lecture theoretical+practical	Passivity, Faraday's law general corrosion, galvanic corrosion, cavernous corrosion.	The student's understanding of the material	2n+2A	27
Discussion, quick quiz, solve problems, Home work	a lecture theoretical+practical	Soil corrosion, facultative corrosion, intercrystalline corrosion, and stress corrosion.	The student's understanding of the material	2n+2A	28
Discussion, quick quiz, solve problems, Home work	a lecture theoretical+practical	Optimal material selection, contour softening, design and operation.	The student's understanding of the material	2n+2A	29
Discussion, quick quiz, solve problems, Home work	a lecture theoretical+practical	Corrosion prevention methods.	The student's understanding of the material	2n+2A	30
<b>11. Course evaluation</b>					
<p>The evaluation is done on the basis of:</p> <ol style="list-style-type: none"> <li>1. First semester exam (theoretical + practical)</li> <li>2. Second semester exam (theoretical + practical)</li> <li>3. Sunnah works (10%), taking into account attendance and participation.</li> <li>4. Final exam (N+A), first round and second round.</li> </ol>					
<b>12. Learning and teaching resources</b>					
<b>Engineering mechanics</b>			Required textbooks (methodology, if any)		

<p>The institute's library for additional curricula resources.</p>	
<p>7- Introduction to production engineering</p> <p>Written by – Hassan Hussein Fahmy, Jalal Shawqi (1966)</p> <p>8- Principles of metal casting</p> <p>Translation – Dr. Salah al-Din Muhammad al-Muhanni</p> <p>9- Metal forming methods</p> <p>Written by - Dr. Anwar Abdel Wahed (1963).</p> <p>10- Manufacturing methods</p> <p>Written by - Dr. Arif Abu Safia, Dr. Abdul Razzaq Ismail Khadr</p> <p>11- Ignition of metals – technological foundations</p> <p>Written by: Abdel Moneim Akef (1977).</p> <p>12- Principles of milling operations</p> <p>Written by – Afrutin, Translated by – Muhammad Abdel Hamid Al-Rifai.</p>	<p>Main references (sources)</p>
<ul style="list-style-type: none"> <li>- Engineering mechanics book</li> <li>- All solid scientific journals that are related to the broad concept of engineering mechanics</li> </ul>	<p>Recommended supporting books and references (scientific journals, reports....)</p>
<p>Websites on the Internet related to mechanical engineering</p>	<p>Electronic references, Internet sites</p>

## Course description form

1. Course Name	
<b>Industrial drawing</b>	
2. Code	
The decision nothing	
3. the chapter /the year	
annual	
4. Date this was prepared	
the description 2/20/2024	
5. Attendance forms available	
Mandatory weekly attendance	
6. Number of study hours (total)/number of units (total)	
90 hours	
7. Name of the course administrator(If more than one name is mentioned)	
Name: Sajjad Karim Kazim Email:	
8. Course objectives	
<p><b>Providing the student with the necessary skills to read technical drawings</b></p> <p><b>Knowledge of symbols, engineering terminology and specifications</b></p> <p><b>Standard, drawing of simple assembled mechanical parts</b></p> <p><b>The most complex and most common method in the student's</b></p>	<p><b>Objectives of the study subject</b></p>

practical life is using the computer using the AutoCAD system.	
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9. Teaching and learning strategies

<p>Deleting the part related to the Autodesk Inventor program from the week22-02And that          Because it is not used as a basic program in government departments and local companies related to drawing          And engineering design.          And as compensation for the weeks thatWe suggestWe recomme          removing Autodesk Inventor from themReturnsome          Topics that had previously been deleted, such as worm gears,          addition to increasing the number of hours (weeks), some topics          Increasing the number of laboratory exercisesBecause of          importanceThe current hours are insufficient for her, such asSprin          And female readers          Bearings, straight and bevel gears</p>	The strategy
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10. Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Discussion, conducting a practical exercise to draw types of lines, projections, and segments	Theoretical lecture+practical	General Revision Types of lines, projection, sections, dimensions by using AutoCAD	The student's understanding of the material	3	1
Discuss and explain the types of screws,	practical	Bolts and bolted joints	The student's understandin	3	2+3

with 2 drawings showing the types of screws and nuts		Type of Bolts and Nuts,  Assembly Drawing for Bolting System	g of the material		
Discussing and explaining the types of screws, while compiling and drawing a picture showing the types of screws and their uses	practical	Keys and Keyways joints,  Types of Keys and their uses,  Assembly Drawing for Keys System	The student's understanding of the material	3	4+5
Discuss and explain the types of welding connections with welding symbols. Drawing 2 assembly panels with symbols for a mechanical jack And Brackett	Theoretical lecture+practical	Welding joints and welding symbols  Assembly Drawing for Welding System indicated the Welding Symbols	The student's understanding of the material	3	6+7
Discussing and explaining the types of fastening with rivets, while compiling and drawing a	a lecturetheoretical+practical	Rivets and Riveted joints,  Types of Rivets and Rivets joints,  Assembly Drawing for Rivets System	The student's understanding of the material	3	8+9

picture showing the types of fastening and their uses					
<b>Drawing a board for assembling the mechanical parts of a mechanical crane</b>	<b>practical</b>	Assembly Drawing to Mechanical Screw jack	The student's understanding of the material	3	10
Explaining springs, their types and uses Draw a picture of a compression spring	<b>practical</b>	Springs, Types of Springs and their uses,  Assembly Drawing for Compressed Spring	The student's understanding of the material	3	11
<b>Drawing a board to assemble the mechanical parts of an exhaust valve</b>	<b>practical</b>	Assembly drawing for exhaust valve	The student's understanding of the material	3	12
Explanation of column connections and their types (Couplings) with Draw a drawing of a rigid coupling.	<b>practical</b>	types of couplings,  Assembly Drawing for Couplings System	The student's understanding of the material	3	13
Explaining clutches, their types and uses Draw in	<b>practical</b>	Clutches, Types of Clutches and their uses,	The student's understanding of the material	3	14

g of a friction clutch.		Assembly Drawing for Clutches System			
Explanation of loading chairs with Drawing an assembly plate for a friction bearing chair.	<b>practical</b>	Bearings, Assembly Drawing for journal Bearing	The student's understanding of the material	3	15
Explaining pulleys and belts, their types and uses Draw a board to assemble parts containing wheels and belts.	<b>practical</b>	Belts and pulleys, Types and their uses  Tow Assembly Drawing Sheets to assemble parts contain, pulleys, and different types of belts	The student's understanding of the material	3	16
Explaining gears and their types, straight gears and basic definitions with Drawing a plate for a gear and an assembly plate for a gear.	<b>practical</b>	Types of Gears, Spur Gear definitions, Drawing Spur Gear, and Assembly drawing for Spur Gear box System	The student's understanding of the material	3	17+18
Explanation of bevel gears with Drawing of a bevel gear	<b>practical</b>	bevel gears, Assembly Drawing for Bevel Gear box System	The student's understanding of the material	3	19+20

<b>Explanation of the program with practical application of the program</b>	a lecturetheoretical+practical	Introduction of Autodesk inventor program	The student's understanding of the material	3	21+22
<b>2D drawing</b>	<b>practical</b>	Drawing Two-Dimension Environment	The student's understanding of the material	3	23
Practical exercise	<b>practical</b>	Assembly Environment	The student's understanding of the material	3	24+25
Practical exercise	<b>practical</b>	Dynamics Analysis Environment & Movement	The student's understanding of the material	3	26+27
Practical exercise	<b>practical</b>	Additions on Engineering Drawings	The student's understanding of the material	3	28
<b>A project to draw a moving crow for a lathe.</b>	<b>practical</b>	Special practical project of any process system	The student's understanding of the material	3	29+30
<b>11. Course evaluation</b>					
1 Theoretical tests (semester, final and daily exams)					
2 Practical tests					
Questions during the lecture					
<b>12. Learning and teaching resources</b>					
			Required textbooks (methodology, if any)		
<u>Arabic sources</u>			Main references (sources)		
1. "Engineering Drawing," by Abd al-Rasul al-Khafaf					
2. "Engineering drawing technology", Ebert and Weander, foreign sources					

3. "Fundamental of engineering drawing", Feench and Vierck. 4. "Engineering drawing", S. Bogolyubove N. Voinov "Basic Technical drawing", Spencer	
<b>International computer magazines</b>	Recommended supporting books and references (scientific journals, reports....)
<b>Websites of solid scientific universities</b>	Electronic references, Internet sites

### Course description form

1. Course Name
Manufacturing processes 2
2. CodeThe decision
nothing
3. the chapter /the year
annual
4. Date this was preparedthe description
2/18/2024

<b>5. Attendance forms available</b>					
Full attendance					
<b>6. Number of study hours (total)/number of units (total)</b>					
Weekly (theoretical lessons in classrooms + practical lessons in workshops)					
<b>7. Name of the course administrator(If more than one name is mentioned)</b>					
Name: Email:					
<b>8. Course objectives</b>					
<p>Graduating a cadre capable of working in the fields of manufacturing and production and preparing to contribute to the following work:</p> <p>0–Ability to analyze processes into operating components.</p> <p>2. Preparing the technological path between production units.</p> <p>3. Preparing operating cards and orders for each unit and each machine, and calculating components, operating times, and loading programs for the units.</p> <p>4. Conduct preliminary calculations of operating costs.</p>				<p><b>Objectives of the study subject</b></p>	
<b>9. Teaching and learning strategies</b>					
<p>1. Explanation and clarification</p> <p>2. Lecture method</p> <p>3. The applied aspect In laboratories and workshops</p>				<p><b>The strategy</b></p>	
<b>10. Course structure</b>					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
oral exams, the exams Written and tested process quarterly exams, Final exams, evaluation daily)	lecture The workshop Laboratory The practical side	Engineering tolerances , dualities, duality systems, determinants of measurement	The student understands tolerances And use determiner s	4Hours per week )6Theoretical +6practical ( Total82hour	The first - the fourth

oral exams, the exams Written and tested process quarterly exams, Final exams, evaluation daily)	lecture The workshop Laboratory The practical side	metal working, Types of angles, cutting edge, cutting speed	The student understands operating methods and calculates cutting speed	4Hours per week )6Theoretical +6Practica l (total64ho ur	V - X
oral exams, the exams Written and tested process quarterly exams, Final exams, evaluation daily)	lecture The workshop Laboratory The practical side	Turret turning, milling, heads Partition, tools for connecting artifacts	The student understands the work The turret lathe, the milling process, and the use of dividing heads	4Hours per week )6Theoretical +6Practica l (total61ho ur	eleventh - Fifteenth
oral exams, the exams Written and tested process quarterly exams, Final exams, evaluation daily)	lecture The workshop Laboratory The practical side	Milling knives, types of gears, Operating rates, feeding speed	The student understands knives Milling and types of gears It calculates operating rates and feeding speed	4Hours per week )6Theoretical +6Practica l (total61ho ur	sixteenth - twentieth h
oral exams, the exams Written and tested process quarterly exams, Final exams, evaluation daily)	lecture The workshop Laboratory The practical side	Skimming, types Planers, grinding, cutting theory	The student understands the process of scraping, types of planers and grinding, and the theory of scraping	4Hours per week )6Theoretical +6Practica l (total61ho ur	Twen ty-first - twenty- fifth
oral exams, the exams Written and tested process	lecture The workshop	Machining card, metal forming, rolling, extrusion,	The student can prepare the operation	4Hours per week )6Theoretical +6Practica	VI Twenty - thirty

quarterly exams, Final exams, evaluation daily)	Laboratory The practical side	shearing, punching	card and understands Forming, rolling, extrusion, shearing and punching process	l (total61hour	
<b>11. Course evaluation</b>					
<ol style="list-style-type: none"> <li>1. Daily oral and written exams</li> <li>2. Semester and final exams.</li> <li>3. Marks for participation, questions, and discussion of theoretical and practical study topics during the lectures.</li> <li>4. Grades for homework.</li> <li>5. Degrees for writing reports and conducting scientific research</li> </ol> <p>In the context of the vocabulary of the scientific subject</p>					
<b>12. Learning and teaching resources</b>					
Manufacturing processes			Required textbooks (methodology, if any)		
1Introduction to production engineering 2Production engineering technology and dimensional design			Main references (sources)		
Books on metal working processes Books on metal forming processes Scientific reports on free websites			Recommended supporting books and references (scientific journals, reports....)		
YouTube educational website Free books and research sites, including: <a href="https://en.wikipedia.org/wiki/Computer-integrated_manufacturing">https://en.wikipedia.org/wiki/Computer-integrated_manufacturing</a> <a href="http://files.books.elebda3.net/elebda3.net-7468.pdf">http://files.books.elebda3.net/elebda3.net-7468.pdf</a> <a href="http://download-engineering-pdf-ebooks.com/80-1-library-books">http://download-engineering-pdf-ebooks.com/80-1-library-books</a> <a href="http://download-engineering-pdf-ebooks.com/86-1-library-books">http://download-engineering-pdf-ebooks.com/86-1-library-books</a> <a href="https://docs.google.com/viewerng/viewer?url=http://files.books.elebda3.net/elebda3.net-6816.pdf&amp;hl=ar">https://docs.google.com/viewerng/viewer?url=http://files.books.elebda3.net/elebda3.net-6816.pdf&amp;hl=ar</a> <a href="http://www.kemet.co.uk/blog/lapping/how-to-measure-flatness-technical-article">http://www.kemet.co.uk/blog/lapping/how-to-measure-flatness-technical-article</a>			Electronic references, Internet sites		

## Course description form

13. Course Name					
<b>Calculator applications-2</b>					
14. CodeThe decision					
nothing					
15. the chapter /the year					
annual					
16. Date this was preparedthe description					
2/18/2024					
17.aAttendance forms available					
Al-Nadhari's presence in the halls and practical presence in the computer laborator					
18.Number of study hours (total)/number of units (total)					
1 hour N + 2 hours E = 3 hours per week					
19. Name of the course administrator(If more than one name is mentioned)					
Name: Email:					
20. Course objectives					
Introducing the student to using the 2D and 3D engineering drawing program(AutoCAD 2D&3D)With applications in his field of specialization					<b>Objectives of the student subject</b>
21. Teaching and learning strategies					
1- Providing students with the basics and additional topics related to the course outcomes  2- Giving a set of drawings for each topic in the course  3-Displaying the steps of computer drawing by drawing one of the drawings with the steps and displaying them on the projector					<b>The strategy</b>
22. Course structure					
<b>Evaluation method</b>	<b>Learning method</b>	<b>Name of the unit or topic</b>	<b>Required learning outcomes</b>	<b>hours</b>	<b>the week</b>
Physical and practical exams	Lecture computer	Introduction to the program AutoCAD screen settings	AutoCAD program settings	3	<b>the first</b>

	projector	(Snap, Limit, Grid, Pan, Zoom,....)			
Physical and practical exams	Lecture computer projector	Drawing list(Draw)	Learn drawing commands from the main menus in the AutoCAD window	9	<b>The second, third and fourth</b>
Physical and practical exams	Lecture computer projector	List of revisions(modify).	Learn modification commands	6	<b>Fifth And the sixth</b>
Physical and practical exams	Lecture computer projector	(Object.Snap List)	Learn modification commands	3	<b>Seventh</b>
Physical and practical exams	Lecture computer projector	(Layers)	Learn class commands	3	<b>VIII</b>
Physical and practical exams	Lecture computer projector	Dimension	Enter dimensions on the drawing	3	<b>Ninth</b>
Physical and practical exams	Lecture computer projector	Writing, scratching Hatching	Learning to write and drawing	3	<b>The tenth</b>
Physical and practical exams	Lecture computer projector	Store files, import files from other programs, and export them.	Learn how to store and retrieve files	3	<b>eleventh</b>
Physical and practical exams	Lecture computer projector	(Blocks) work And import parts from other programs such as: Split an element by equal spaces(Divide) ,distribution of elements along a path (Measure)	block. blockLearn the commands and divide	3	<b>the second ten</b>

Physical and practical exams	Lecture computer projector	Computer drawing applications according to the department's specialization.	Draw applied examples	6	<b>Three and fourteen</b>
Physical and practical exams	Lecture computer projector	Printing and reproduction And output the files to the plotter.	Learn to print And cloning	3	<b>Fifteenth</b>
Physical and practical exams	Lecture computer projector	Principles of drawing in three dimensions.	Learn the principles of 3D drawing	3	<b>sixteen</b>
Physical and practical exams	Lecture computer projector	List of cortical trigramsSurface ).	Learn to draw shapes from drawing menus	12	<b>seventeenth- The twentieth</b>
Physical and practical exams	Lecture computer projector	List of solid trigrams(Solids).	Learn to draw shapes from drawing menus	9	<b>atheistic Twenty-third And the twenty</b>
Physical and practical exams	Lecture computer projector	Applications on orders Slice - Revolve - Extrude	Applications to some modification orders	9	<b>the fourth Twenty-sixth</b>
Physical and practical exams	Lecture computer projector	Solid drawing revisions Editing	Learn how to edit your drawing	6	<b>Twenty-seventh and twenty-eighth</b>
Physical and practical exams	Lecture computer projector	Draw an applied example Within the department's jurisdiction.	Draw applied examples	6	<b>Ninth Twenty and thirty</b>

### 23. Course evaluation

2. Daily oral and written exams
3. ExamsFSolid and final.
4. Marks for participation, questions and discussion of theoretical study topicsAnd the process duringCourse of lectures.
5. Degrees for writing reports and conducting scientific research in the context of scientific subject vocabulary.

24. Learning and teaching resources	
	Required textbo (methodology, if any)
<p><b>1- "Auto CAD Smart Book", Mostafa Abd El-Basset.</b></p> <p><b>2- "Mastering Auto CAD 2002", George Omura.</b></p> <p><b>3- "Yi 2D and 3D drawing exercises," Amjad Ali Jassim.</b></p> <p><b>4-“Computer Aided Drawing”, General Organization for Technical Education and Vocational Training</b></p>	Main references (sources)
International computer magazines	Recommended supporting books and references (scientific journals, reports....)
Websites of solid scientific universities	Electronic references, Inter sites

## Course description form

1. Course Name	
<b>Management and professional safety</b>	
2. Code	
The decision nothing	
3. the chapter /the year	
annual	
4. Date this was prepared	
the description 2/18/2024	
5. aAttendance forms available	
Full attendance in classrooms	
6. Number of study hours (total)/number of units (total)	
2 hours Weekly 60 hours	
7. Name of the course administrator(If more than one name is mentioned)	
Name: Rajha Daaboul Email:	
8. Course objectives	
<b>Graduating a cadre capable of working in the fields of manufacturing and production and preparing to contribute to the following work:</b>  1. <b>The ability to identify</b> Specific deviation control charts.	<b>Objectives of the student subject</b>

<p>2. <b>Preparation</b>Control charts for variables (control chart for arithmetic mean).</p> <p>3. <b>The ability to identify</b>Factors controlling quality, developing and improving quality.</p> <p>4. <b>a JRA. Initial calculations of work costs</b></p>					
<p>9. Teaching and learning strategies</p>					
<p>1- Explanation and clarification  2- Display models and illustrations  3- Use modern display devices  4- Lecture method  5- Use of devices and equipmentAvailable inIn laboratories and workshops</p>		<p><b>The strategy</b></p>			
<p>10. Course structure</p>					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Physical and practical exams	Nazari's lecture	Administration : Management and its development, stages and development of management, basic principles of management, characteristics of management, levels of management.	The student's understanding of the material	2 hours a week	the first

Physical and practical exams	Nazari's lecture	Administration : Administrative functions, industrial management, its functions, industrial engineering, characteristics of industrial management.	The student's understanding of the material	<b>2 hours a week</b>	the second
Physical and practical exams	Nazari's lecture	Industrial unit arrangement: - Location and arrangement of the industrial unit - The main factors affecting the selection of industrial project sites. - Arrangement of the industrial unit (initial arrangement of the factory). - Classification of types of industrial unit arrangements. - Advantages, limitations, and cases in which it is applied	The student's understanding of the material	<b>2 hours a week</b>	the third

		(commodity, functional, mixed, and combined arrangement).			
Physical and practical exams	Nazari's lecture	Feasibility study for industrial projects: An idea about the feasibility study for industrial projects. Industrial project Stages of feasibility studies The importance of feasibility studies.	The student's understanding of the material	<b>2 hours a week</b>	the fourth
Physical and practical exams	Nazari's lecture	Production planning: Production planning, the concept of production planning, objectives of production planning and control.	The student's understanding of the material	<b>2 hours a week</b>	Fifth
Physical and practical exams	Nazari's lecture	Production planning: Types of production, production planning	The student's understanding of the material	<b>2 hours a week</b>	VI

		methods, linear programming methods, graphical method, and transportation method.			
Physical and practical exams	Nazari's lecture	Discussing reports submitted by students with a test.	The student's understanding of the material	2 hours a week	Seventh
Physical and practical exams		Study work and standard time: Work study, work study methods, method study, time study, work measurement.	The student's understanding of the material	2 hours a week	VIII
Physical and practical exams	Nazari's lecture	Maintenance: Maintenance, the importance of maintenance, the concept of the technological system	The student's understanding of the material	2 hours a week	Ninth
Physical and practical exams	Nazari's lecture	Maintenance: Types of maintenance, types of holidays.	The student's understanding of the material	2 hours a week	The tenth
Physical and practical exams	Nazari's lecture	Training: Training, the concept of	The student's understanding of the material	2 hour	eleventh

		training, the importance of training, training methods.		<b>s a week</b>	
Physical and practical exams	Nazari's lecture	Industrial costs and wages: Costs, classification of costs, wages.	The student's understanding of the material	<b>2 hours a week</b>	twelveth
Physical and practical exams	Nazari's lecture	Industrial costs and wages: Methods of calculating wages, incentives, and types of incentives	The student's understanding of the material	<b>2 hours a week</b>	Thirteenth
Physical and practical exams	Nazari's lecture	purchase management: Purchases, purchasing steps, inventory, types of stored materials and methods of controlling them.	The student's understanding of the material	<b>2 hours a week</b>	fourteenth
Physical and practical exams	Nazari's lecture	Industrial safety : Industrial safety, accidents, types of accidents, road	The student's understanding of the material	<b>2 hours a week</b>	.Fifteenth

		accidents, protective equipment and their types.			
Physical and practical exams	Nazari's lecture	Quality control: The meaning of control, the meaning of quality.	The student's understanding of the material	<b>2 hour s a week</b>	sixteen
Physical and practical exams	Nazari's lecture	Quality control: Definition of quality, quality specifications, factors controlling quality, development and improvement of quality, design, conformity quality, international and Iraqi standard specifications.	The student's understanding of the material	<b>2 hour s a week</b>	seventeenth
Physical and practical exams	Nazari's lecture	Quality control methods and sample inspection plans: Quality control methods, examination	The student's understanding of the material	<b>2 hour s a week</b>	eighteen

		and inspection methods, quality control steps, sampling methods, sample inspection schedule.			
Physical and practical exams	Nazari's lecture	Quality control methods and sample inspection plans: Operating characteristic curve, quality of design, data collection (type and analysis).	The student's understanding of the material	<b>2 hours a week</b>	nineteenth
Physical and practical exams	Nazari's lecture	Control charts	The student's understanding of the material	<b>2 hours a week</b>	The twentieth
Physical and practical exams	Nazari's lecture	Control charts: Preparing and using a mean chart. Preparing and using a Pareto chart.	The student's understanding of the material	<b>2 hours a week</b>	21st
Physical and practical exams	Nazari's lecture	Control charts: Prepare a chart with standard deviation	The student's understanding of the material	<b>2 hours a week</b>	twenty tow

		Prepare a defect chart			
Physical and practical exams	Nazari's lecture	Control charts: Scatterplot, how to prepare a scatterplot.	The student's understanding of the material	2 hours a week	twenty third
Physical and practical exams	Nazari's lecture	Vocabulary details	The student's understanding of the material	2 hours a week	twenty fourth
Physical and practical exams	Nazari's lecture	Control charts: Quality control charts for standard deviation and percentage of defective units. Histogram (preparation and use)	The student's understanding of the material	2 hours a week	25th
Physical and practical exams	Nazari's lecture	Types of control charts: Control charts for variables (control chart for arithmetic mean(X-chart).	The student's understanding of the material	2 hours a week	twenty-sixth
Physical and practical exams	Nazari's lecture	Types of control charts: Control charts for variables (control chart for rangesR-Chart and control chart for standard	The student's understanding of the material	2 hours a week	27th

		deviation $\delta$ -chart).			
ExamsNadriyaAnd practical	Nazari's lecture	Types of control charts: Control charts for features (Control chart for the percentage of defective unitsP-chart).	The student's understanding of the material	2 hours a week	Twenty-eighth
ExamsNadriyaAnd practical	Nazari's lecture	Types of control charts: Control charts for features (Control chart for the number of defects in one itemC-Chart).	The student's understanding of the material	2 hours a week	XXIX
<b>11. Course evaluation</b>					
<ol style="list-style-type: none"> <li>1. Daily oral and written exams</li> <li>2. Semester and final exams.</li> <li>3. Marks for participation, questions, and discussion of theoretical and practical study topics during the lectures.</li> <li>4. Grades for homework.</li> </ol> <p>Degrees for writing reports and conducting scientific research in the context of scientific subject vocabulary</p>					
<b>12. Learning and teaching resources</b>					
Industrial Administration - Authority of Technical Institutes1991		Required textbooks (methodology, if any)			
<ul style="list-style-type: none"> <li>- Industrial Engineering - Dar Al-Kutub for Printing and Publishing - University of Basra - first edition2222</li> <li>- Total quality management and ISO requirements</li> </ul>		Main references (sources)			

-Total Quality Management Scientific reports on free websites	Recommended supporting books and references (scientific journals, reports....)
YouTube educational website Free books and research sites, includi	Electronic references, Internet sites

### Course description form

13. Course Name	
<b>Factor/2</b>	
14. Code	The decision
	nothing
15. the chapter /the year	
	annual
16. Date this was prepared	the description
	2/19/2024
17.a Attendance forms available	
	Full attendance weekly
18. Number of study hours (total)/number of units (total)	
	8 hours of my eyes Weekly 240 hours

19. Name of the course administrator(If more than one name is mentioned)					
Name: Khalil Fadel Abdel Khader Email:					
20. Course objectives					
Objective of the course: Acquiring the manual skill to carry out operating and manufacturing operations using various hand tools and measuring tools and the ability to work and operate operating machines in the optimal production method.				Objectives of the subject	
21. Teaching and learning strategies					
5. Explanation and clarification 6. Display models and illustrations 7. Lecture route 8. Use Devices and tools Drat Available in And the workshops					The strategy
22. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
<b>Milling workshop 5 weeks</b>					
Oral exams	Practical exercises	<b>1- Milling (5 weeks)</b> 1- Horizontal milling machine, main unit.  Explaining the parts of the machine and the function of each one, operating the machines and choosing speeds and feeds, tools and devices attached to the machines and their uses and methods of installing them, dividing heads, slots, rotary	Student understanding of the exercise	8 hours per week	the first

		<p>trays, universal milling heads, rack work heads, sewer work heads.</p> <p>2- Milling balls:</p> <p>Types (cylindrical surface milling, shoulder milling, sewage work blocks, gear sharpening machines, special cylindrical forming machines with internal or peripheral holes)</p> <p>Uses of cables, methods of installing them, and installing artifacts</p> <p>3- Milling flat surfaces:</p> <p>Choosing and installing the appropriate cutter, adjusting the cutting and feeding speeds, how to install the workpieces, the sequence of operating operations, parts of the milling operations to prepare flat, inclined and opposite surfaces and create a group of different ducts.</p>			
Oral exams	Practical exercises	<p>1- Splitting heads and their uses:</p> <p>The dividing device and how to use it, simple dividing, dividing using circles of holes, differential dividing, dividing corners, doing exercises on different types of dividing (dividing parts, dividing corners).</p>	Student understanding of the exercise	8 working hours	<b>the second</b>

		2- Milling straight gears on general machines and gear racks, rules for cutting gears, used chains, service equipment, and preparing processing and operating processes, parts for milling operations, reviewing the final dimensions, training on milling a gear arch and gear rack.			
Oral exams	Practical exercises	1- Milling bevel gears on general machines: (The same method for milling straight gears) 2- Milling helical gears and inclined racks on general machines:  (The same method for milling straight gears)	Student understanding of the exercise	8 working hours	the third
Oral exams	Practical exercises	1- Milling crafts by dividing the corners 2- Milling of internal sewers. 3- Milling curves, explaining the general laws of each process, steps to implement it, preparing raw materials, choosing diameters, choosing operating rates,		8 working hours	the fourth

		performing milling operations, reviewing the dimensions of the artifacts.			
Oral exams	Practical exercises	<p>Milling machine maintenance:</p> <ol style="list-style-type: none"> <li>1- Dismantling and installing the mandrel shaft.</li> <li>2- Opening, maintaining and installing the machine table.</li> <li>3- Open the speed box for the main parts and learn how to change the speeds and reinstall them.</li> <li>4- Open the feed speed box and learn how to change it and reinstall it.</li> <li>5- Performing speed-changing operations using belts and pulleys and learning how to convert them and the process of tightening them.</li> <li>6- Identify the electrical control circuits for operating the milling machine.</li> </ol>		8 working hours	<b>Fifth</b>
<b>2- - Grinding (5 weeks)</b>					

<p>Ora l exa ms</p>	<p>Practica l exerc ises</p>	<p><b>2Grinding machines:</b> (Internal and external cylindrical, eccentric grinding, surface grinding, tool sharpening) 1- Grinding stones:  Their shapes, types, specifications, use of each, preparing grinding stones for operation (adjusting balance, leveling stones). 2- Surface grinding machines:  Explaining the parts of the machine and the function of each, the method of operation and adjusting the travel, the speed of feeding and feeding, methods of installing the workpieces, the use of cooling fluids and its types. 3- Training on grinding flat, parallel, perpendicular and inclined surfaces. 4- Drain grinding: Training on grinding different drains and round drains.</p>	<p>Student understanding of the exercise</p>	<p>8 worki ng hours</p>	<p><b>the first</b></p>
<p>Ora l exa ms</p>	<p>Practica l exerc ises</p>	<p>1-Cylinder grinding: Parts of the machine, how to operate it, adjusting operating speeds and rates, testing the appropriate stone for the workpiece, installing the artifacts, using cooling fluids and measuring tools.</p>	<p>Student understanding of the exercise</p>	<p>8 worki ng hours</p>	<p><b>the seco nd</b></p>

		2- Exercises on external and internal cylindrical grinding operations.			
Oral exams	Practical exercises	1-Eccentric grinding and grinding of cranks. 2-Various grinding operations using previous grinding operations and training on them.	Student understanding of the exercise	8 working hours	<b>the third</b>
Oral exams	Practical exercises	Number sharpening machine: 1- Operating tool sharpening machines, how to deal with them, and choosing the appropriate machine for sharpening the specific tool. 2- How to install the cutting tool on the machine and determine the required angles for the cutting edge. 3- Performing sharpening operations on models of a number of pieces (single-edged cutting tool, double-edged cutter, multi-edged cutting tool.	Student understanding of the exercise	8 working hours	<b>the fourth</b>
Oral exams	Practical exercises	Maintenance of grinding machines (general internal and external cylindrical grinding machines) 1- How to replace the coolant and determine the required level.	Student understanding of the exercise	8 working hours	<b>Fifth</b>

		<p>2- Determine the lubrication locations for the machine and the appropriate type of oil and grease.</p> <p>3- Performing the process of replacing the belts that transmit rotary speeds for stone and workpieces.</p>			
<b>- 3-Scraping (5 weeks).</b>					
Ora l exa ms	Practica l exerc ises	<p>1- Flat and vertical planers: The difference between using each of them, the parts of the machine and the method of work, the objects and surfaces that can be operated on each of them, the pens used, the methods for installing them, the speeds of cutting and feeding, the inoculation rates, and the selection of each of them.</p> <p>2- Exercises for scraping straight and inclined surfaces at different angles.</p> <p>3- Exercises to make internal and external drains of various shapes.</p>	Student understanding of the exercise	8 working hours	<b>the first</b>
Ora l exa ms	Practica l exerc ises	Exercises for scraping entire surfaces and artifacts, including parts of machines.V Block, Drill Bases.	Student understanding of the exercise	8 working hours	<b>the second</b>

Ora l exa ms	Practica l exerc ises	Exercises on scraping arcs, making sewers on circular works using dividing devices on planers.	Student understandin g of the exercise	8 worki ng hours	<b>the third</b>
Ora l exa ms	Practica l exerc ises	Various scraping exercises.	Student understandin g of the exercise	8 worki ng hours	<b>the fourth</b>
Ora l exa ms	Practica l exerc ises	Maintenance of skimmer machine: 1- Maintenance of the cart scraping machine. 2- Opening the crocodile and maintenance parts for the control parts along the stroke, as well as changing the location of the stroke. 3- Parts of various lubrication and lubricating operations and opening the oil pump.	Student understandin g of the exercise	8 worki ng hours	<b>Fifth</b>
<b>4-Lathing (5 weeks)</b>					
Ora l exa ms	Practica l exerc ises	1- Eccentric turning and turning using a quadrilateral eyelet and methods of installing special workpieces. 2-Exercises on various eccentric objects..	Student understandin g of the exercise	8 worki ng hours	<b>the first</b>
Ora l exa ms	Practica l exerc ises	1- External and internal rotation lathe and formation lathe. 2-Exercises for various lathe operations using modeling pens.		8 worki ng hours	<b>the second</b>
Ora l	Practica l	Turret lathes:	Student understandin	8 worki ng hours	<b>the third</b>

exams	exercises	<p>1- A general idea about turret lathes and the use of speed and feed tables.</p> <p>2- Follow up on the operations of various products and prepare the sequence of their operations.</p>	g of the exercise		
Oral exams	Practical exercises	<p>1- The pens and tools used, the method of adjusting them, and preparation for making various crafts.</p> <p>2-How to prepare maps that follow operations.</p>	Student understanding of the exercise	8 working hours	<b>the fourth</b>
Oral exams	Practical exercises	Vocabulary details	Student understanding of the exercise	8 working hours	<b>Fifth</b>
<b>5- Machines programmed using G-Code</b>					
Oral exams	Practical exercises	<p>1- A historical overview of the machines CNC, differences between regular machines and CNC machines, stages of work on programmed machines.</p> <p>2- Defining the parts of the machine, the movement axes, the control panel, and defining and operating the machine in practice.</p>	Student understanding of the exercise	8 working hours	<b>the first</b>
Oral exams	Practical exercises	<p>1- Program, program structure, how to program milling machines, functions used in programmed machines, zero point of the machine,</p>	Student understanding of the exercise	8 working hours	<b>the second</b>

		<p>functions of movement levels.</p> <p>(G17, G18, G19) Motion coordinate functions (G90, G91).</p> <p>2- Simulation work(Simulation) using simulation programs, how to use the program, program instructions.</p> <p>3- Control panel of the machineCNC according to the ISO9001 system, executing movements via a manual control device, zeroing the machine, zeroing the triangular machine, zeroing the workpiece, and methods for installing the workpiece.</p>			
Oral exams	Practical exercises	<p>1- Linear motion functions(G1,G2), functions to store segment zero points (reference points)</p> <p>(G1,G2,G3,G4,G5,G6,G7,G8,G9,G10,G11,G12,G13,G14,G15,G16,G17,G18,G19,G20,G21,G22,G23,G24,G25,G26,G27,G28,G29,G30,G31,G32,G33,G34,G35,G36,G37,G38,G39,G40,G41,G42,G43,G44,G45,G46,G47,G48,G49,G50,G51,G52,G53,G54,G55,G56,G57,G58,G59), auxiliary functions F,M,S,T</p> <p>2- Implement a face milling program using the instructions above and apply it to the calculator using simulation programs</p>	Student understanding of the exercise	8 working hours	the third

		<p>and implement it practically on the machine.</p> <p>3- Rotary motion functions G2, G3, repetition function, mirror image formation function.</p>			
Ora l exa ms	Practica l exerc ises	<p>1- Create a program to implement circular cuts (quarter circle, semicircle, full circle) and apply it on the calculator using simulation programs and implement it practically on the machine.</p> <p>2- Radius compensation functions (calibration functions) G40, G41, G42, G43, G44</p> <p>3- Create a program to implement two exercises, one of which is relief and the other is drilling, and apply it on the calculator using simulation programs and implement it on the machine using the above functions.</p>	Student understanding of the exercise	8 working hours	<b>the fourth</b>
Ora l exa ms	Practica l exerc ises	<p>1- Fixed functions, single-stage drilling function, two-stage drilling function, tooth operating function,</p>	Student understanding of the exercise	8 working hours	<b>Fifth</b>

		<p>hole expansion function, sifting ring function, longitudinal slit operating function, circular drilling operating function.</p> <p>2- Implementing a program using the previous functions and applying it on a calculator using simulation programs and executing it on a machine.</p> <p>3- Maintenance of the machine, how to replace the parts, check the lubrication system in the machine and lubricate the rotating shaft, check the cooling system and replace the coolant.</p>			
<b>6-Vocabularies for the workshop of programmed machines that operate with a systemCAD-CAM</b>					
Oral exams	Practical exercises	<p>1- Introducing students to programmed machines, their accessories, and accompanying programs.</p> <p>2- Identify the parts of the programmed lathe machine. Control panel keys and their respective functions, number of pieces, machine axes.</p>	Student understanding of the exercise	8 working hours	<b>the first</b>

		3-Use a programCAD-CAM to design an engineering product and implement the product on the calculator using a simulation method.			
Ora l exa ms	Practica l exerc ises	Learn how to replace a damaged kit or define a new kit. Implementing an integrated product on the machine starting from the design stage using the programCAD/CAM, through the simulation process, and ending with implementing the product on the machine.	Student understanding of the exercise	8 working hours	<b>the second</b>
Ora l exa ms	Practica l exerc ises	1- Identify the parts of the programmed milling machine: the control panel keys and the function of each, the number of pieces, and the machine axes. 2- Use a programCAD/CAM to design an engineering product and implement the product on a calculator using a simulation method.	Student understanding of the exercise	8 working hours	<b>the third</b>
Ora l exa ms	Practica l exerc ises	1- Learn how to replace a damaged number or define a new number. 2- Implementing an integrated product on the machine, starting from the design stage on the	Student understanding of the exercise	8 working hours	<b>the fourth</b>

		programCAD/CAM, passing through the simulation process and ending with implementing the product on the machine.			
Oral exams	Practical exercises	Carrying out many exercises on lathe and milling machines.	Student understanding of the exercise	8 working hours	<b>Fifth</b>
<b>23. Course evaluation</b>					
<p><b>The evaluation is done on the basis of:</b></p> <ul style="list-style-type: none"> <li>5- Attendance at the lecture–Participation or discussion in the lesson</li> <li>6- Tests taken from the lecture</li> <li>7- Providing scientific reports on the subject’s courses, specifically related to the topic of the lecture</li> <li>8- Making small projects</li> </ul>					
<b>24. Learning and teaching resources</b>					
	Required textbooks (methodology, if any)				
	Main references (sources)				
	Recommended supporting books and references (scientific journals, reports....)				
	Electronic references, Internet sites				