

Academic Program Description Form

University Name: .. Al-Furat Al-Awsat Technical University

Institute: .. Babylon Technical Institute

Scientific Department..... Department of Mechanical Technologies.....

Academic or Professional Program Name: .. Diploma in Mechanical Technology ...

Final Certificate Name.. Technical diploma in mechanics.....


Academic System: ... annual

Description Preparation Date: 2024/2/1

File Completion Date: 2024/2/8



Signature: 
Head of Department Name:
L. Faez Jawad Kazem


Date:

Signature: 
Scientific Associate Name:
A.P Oras Khudhayer Obayes

Date:

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

Date: 
Signature: 

Prof. Dr. 
Eman Mohamed Abdullatif
Dean of
Babylon Technical Institute
Approval of the Dean

Director of the Quality Assurance and University Performance Department:

L.Khansaa Aziz Abbas

Date:

Signature:

Approval of the Dean

1. Program Vision

Program vision The Babylon Technical Institute aspires, through existing educational programs, to create a technical educational system based on the requirements and needs of society and service facilities related to the specialty in a way that serves the required civil development is written here as stated in the university's catalogue and website.

2. Program Mission

Program mission is written here as stated in the university's catalogue and website. The oath, which is considered one of the basic and important departments in all the formations of Al-Furat Al-Awsat Technical University, carries out a sublime message, as it works to achieve the goals and aspirations of the students by creating an appropriate educational environment and providing all the material and human requirements necessary to achieve this. And work to graduate groups capable of serving society in providing scientific and technical competence through technical education in accordance with internationally approved quality standards.

3. Program Objectives

General statements desk* Cognitive skills: Providing basic knowledge in production principles along with the knowledge necessary to support mathematics, computer, and engineering basics.

* Technical skills: developing basic skills in mechanical sciences, especially plumbing, turning, welding, carpentry, and filing workshops, in addition to other information about the computer.

communication skills :*

Developing the ability to organize information, whether orally, written, or graphically, in matters such as teamwork, leadership, occupational safety, ethics, service, economics, etc.

*Preparation for the profession: Providing a broad appreciation of the problems that arise in professional practice, including ribbing what the program or institution intends to achieve.

4. Program Accreditation

Does the program have program accreditation? And from which agency? NO

5. Other external influences

Summer training for all, in addition to holding awareness seminars for students

6. Program Structure

| Program Structure | Number of Courses | Credit hours | Percentage | Reviews* |
|------------------------|-------------------|--------------|------------|----------|
| Second mechanic | 21 | 129 | 16% | All |

| | | | | |
|--------------------------------|-----------|----------------------|------------|-----------------------------|
| College Requirements | 18 | 122 | 15% | courses are core |
| Department Requirements | 18 | 122 | 15% | |
| Summer Training | – | Without units | – | |
| Other | – | – | – | |

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

| 7. Program Description | | | | |
|-------------------------------|--------------------|----------------------------------|---------------------|------------------|
| Year/Level | Course Code | Course Name | Credit Hours | |
| | | | theoretical | practical |
| Second mechanic | A. Minerals | Minerals | 2 | 2 |
| Second mechanic | E.L | English language | 1 | – |
| Second mechanic | M.P | Manufacturing processes | 2 | 2 |
| Second mechanic | D.I | Drawing industrial | ..... | 3 |
| Second mechanic | I.M | Industrial management | 2 | ..... |
| Second mechanic | P. | project | ..... | 2 |
| Second mechanic | C.A | computer applications | 1 | 2 |
| Second mechanic | M.T | Machined parts Technology | 3 | ..... |
| Second mechanic | B.P.C | Baath Party Crimes | 2 | ..... |
| First mechanic | M.P | Manufacturing processes | 2 | 2 |
| First mechanic | M.P | Material properties | 2 | ..... |
| First mechanic | M. | Mechanical | 2 | 3 |
| First mechanic | F. | Factor | ..... | 8 |
| First mechanic | M. | Mathematics | 2 | ..... |
| First mechanic | E.D | Engineering Drawing | ..... | 3 |

| | | | | |
|----------------|-----|------------------------|---|-------|
| First mechanic | C.A | computer applications | 1 | 2 |
| First mechanic | E.T | Electricity Technology | 1 | 2 |
| First mechanic | R.D | Rights and democracy | 2 | ..... |
| First mechanic | E.L | English language | 1 | ..... |

8. Expected learning outcomes of the program

| Knowledge | |
|---------------------|---|
| Learning Outcomes 1 | Lear A1– Identifying machine parts and how to maintain them. A2– Identify metals, their properties, and heat treatments. A3– How to use the computer in terms of drawing shapes and machine parts. A4– Learn about labor management and industrial projects.ning Outcomes Statement 1 |
| Skills | |
| Learning Outcomes 2 | Learning O B1 – Production processes for metals B2 – Maintenance of devices and equipment outcomes Statement 2 |
| Learning Outcomes 3 | Learning Outcomes Statement 3 |
| Ethics | |
| Learning Outcomes 4 | Learning C1– The student must pay attention to respecting time and order in the classroom C2– That the student understands what cognitive excellence and scientific excellence mean C3– The student should listen carefully to the professor’s explanation Outcomes Statement 4 |
| Learning Outcomes 5 | Learning O– Activate the student’s thinking through sudden and quick questions 2– A quick review of the material presented in previous lectures outcomes Statement 5 |

9. Teaching and Learning Strategies

Teaching and learning strat1– Training the student on the latest devices.

- 2- Preparing technical staff capable of work and maintenance.
- 3- The student studies the computer subject (the Internet and its accessories).egos and methods adopted in the implementation of the program in general.

10. Evaluation methods

- 1- Listen to the student's solution.
- 2- Answering questions using paper and the blackboard.at all stages of the program in general.

11. Faculty

Faculty Members

| Academic Rank | Specialization | | Special Requirements/Skills (if applicable) | | Number of the teaching staff | |
|---------------------|--------------------------------------|--------------------------------------|---|--|------------------------------|----------|
| | General | Special | | | Staff | Lecturer |
| Professor | Industrial management | advanced systems | | | 2 | |
| | Mechanical | nuclear | | | | |
| Assistant Professor | Industrial Engineering | Industrial Engineering | | | 1 | |
| Lecturer | Production and Materials Engineering | Production and Materials Engineering | | | 3 | |
| | Applied Mechanics | Metallurgical Engineering | | | | |
| | Mechanics | Ceramic | | | | |

| | | | | | | |
|--------------------|--|--|--|--|---|--|
| | of materials | | | | | |
| Assistant Lecturer | general mechanic | Refractories | | | 5 | |
| | Agricultural machinery and equipment engineering sciences | Agricultural machinery and equipment engineering sciences | | | | |
| | Materials Engineering | Materials Engineering | | | | |
| | Capacity engineering | Electrical capacity | | | | |
| | Computer Engineering | Software | | | | |

Professional Development nuclear

Mentoring new faculty members

The head of the department greeted the appointees and welcomed them, and they noticed that they were heading towards their workplaces in the department, each according to his specialization and academic achievement, in order to carry out the work of others in it in a good manner, in order to continue the scientific and educational progress and its correct condition, including the maid of the department and the institution in general.

Professional development of faculty members

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

12. **Acceptance Criterion**

Enrollment in the institute takes place through the central admission system in general, and affiliation to the Department of Mechanical Technology is achieved through differentiation between students' grades according to the regulations established by the Ministry of Higher Education and Scientific Research.

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

State briefly the sources of information about the program.

- 1- Methodical books
- 2- Supplies prepared by the teachers
- 3- Modern sources from the Internet.

14. **Program Development Plan**

Medium-term future development plans were developed by a special committee for the department.

| Program Skills Outline | | | | | | | | | | | | | | | |
|------------------------|-------------|--------------------------|-------------------|------------------------------------|----|----|----|--------|----|----|----|--------|----|----|----|
| | | | | Required program Learning outcomes | | | | | | | | | | | |
| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | Skills | | | | Ethics | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| First production | M.P | Manufacturing processes | Basic | | | | √ | | | √ | | | | √ | |
| | M.P | Material properties | Basic | | | | √ | | | √ | | | | √ | |
| First production | E.M | Engineering Mechanics | Basic | | | | √ | | | √ | | | | √ | |
| | M. | Mathematics | Basic | | | | √ | | | √ | | | | √ | |
| First production | E.D | Engineering Drawing | Basic | | | | √ | | | | | | | √ | |
| | C.A | Computer Applications | Basic | | | | √ | | | | | | | √ | |
| First production | F. | Factor | Basic | | | | √ | | | √ | | | | √ | |
| | R.D | Rights and Democracy | Basic | | | | √ | | | √ | | | | √ | |
| First .P | E.L | English language | Basic | | | | √ | | | √ | | | | √ | |
| Second | M.P.T | Machine parts Technology | Basic | | | | √ | | | √ | | | | √ | |

| | | | | | | | | | | | | | | | |
|--------------------------|------------|--------------------------------|--------------|--|--|--|---|--|--|---|--|--|--|---|--|
| Production | | | | | | | | | | | | | | | |
| Second Production | M.P | Manufacturing processes | Basic | | | | √ | | | √ | | | | √ | |
| Second Production | M. | Minerals | Basic | | | | √ | | | √ | | | | √ | |
| Second Production | F. | Factor | Basic | | | | √ | | | √ | | | | √ | |
| Second Production | I.D | Industrial Drawing | Basic | | | | √ | | | √ | | | | √ | |
| Second Production | | Industrial Management | Basic | | | | √ | | | √ | | | | √ | |
| Second Production | C.A | Computer Applications | Basic | | | | √ | | | √ | | | | √ | |
| Second Production | E.L | English language | Basic | | | | √ | | | √ | | | | √ | |

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

Course Description Form

| | |
|---|--|
| 1. Course Name: Rights and Democracy | |
| 2. Course Code: R.D | |
| 3. Semester / Year: First/annual | |
| 4. Description Preparation Date: 8/ 2 / 2024 | |
| 5. Available Attendance Forms: Theoretical lectures | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) : 60 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: A.L. Mustafa Mohammed Email: mustafa.mohammed.iba4@atu.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | 1- Introducing the student to human rights and democracy and how to deal with people within framework of human rights and democracy and teach him respect Human rights and openness to all sects of society 2- Introducing the student and informing him of cultures of other peoples and countries and linking them with the culture of his surroundings to produce the best results..... |
| 9. Teaching and Learning Strategies | |
| Strategy | |

| | |
|--|---|
| | <p>1- Defining the student's role as a human being with rights and duties</p> <p>2- Understanding the culture of his country and his environment and the ability to develop it</p> <p>3- Understand the meaning of democracy correctly, away from chaos and chaos in the name of democracy</p> <p>4- Applying the foundations of correct democracy in various aspects of life</p> |
|--|---|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------|-----------|--------------------------------------|----------------------|----------------------------------|-------------------|
| 1-15 | Two hours | Teaching students about human rights | human rights | Blackboard+ theoretical lectures | Theory exams |
| 15-30 | Two hours | How to implement democracy | democracy | Blackboard+ theoretical lectures | Theory exams |

11. Course Evaluation

The degree is distributed

1- 20 marks for the first semester for practical.

2- 20 marks for the second semester for practical

3 - 10 marks for student activities

4 - 50 marks final exam

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | Lectures are given to students and on chairs, and there is no prescribed methodological book |
| Main references (sources) | <ul style="list-style-type: none"> - Human rights: their concept and goals - Mesopotamian civilization, human rights in Greek civilization - The position of divine laws on human rights |
| Recommended books and references (scientific journals, reports...) | Theoretical lectures |
| Electronic References, Websites | Various internet sites |

| Week | Vocabulary details |
|------|---|
| 1 | Human rights, their definition, and goals The roots of human rights and their development in human history: human rights in ancient and medieval times |
| 2 | Human rights in ancient civilizations, especially the Mesopotamian civilization |
| 3 | Human rights in the Middle Ages: human rights in political doctrines, schools and theories, human rights in companies and their declarations, revolutions and constitutions (English documents, American Revolution, French Revolution, Russian Revolution) Human rights in contemporary and modern history: international recognition of human rights since World War I and the League of Nations |
| 4 | Regional recognition of human rights: European Convention on Human Rights 1950 American Convention on Human Rights 1969 African Charter on Human Rights 1981 Arab Charter on Human Rights 1994 |
| 5 | Non-governmental organizations and human rights (International Committee of the Red Cross, Amnesty International, Human Rights Watch) National human rights organizations |

| | |
|----|--|
| 6 | Human rights in Iraqi constitutions between theory and reality |
| 7 | The relationship between human rights and public freedoms: 1- In the Universal Declaration of Human Rights 1- In regional charters and national constitutions |
| 8 | Necessary human rights and collective human rights |
| 9 | Economic, social and cultural human rights and civil and political human rights Modern human rights: facts in development, the right to a clean environment, the right to solidarity, the right to religion |
| 10 | Guarantees of respect and protection of human rights at the national level, guarantees in the constitution and laws, guarantees in the principle of the rule of law. Guarantees in constitutional oversight, guarantees in freedom of the press and public opinion, the role of non-governmental organizations in respecting and protecting human rights. |
| 11 | Guarantees, respect and protection of human rights at the international level: - The role of the United Nations and its specialized agencies in providing guarantees - The role of regional organizations (the Arab League, the European Union, the African Union, the Organization of American States, the ASEAN Organization) - The role of international non-governmental organizations and public opinion in respecting and protecting human rights |
| 12 | The general theory of freedoms: the origin of rights and freedoms, the project's position on declared rights and freedoms, the use of the term general freedoms. The functional nature of the concept of public freedoms: philosophical considerations of the functional right, structural considerations of the positive right, economic considerations and public freedoms. |
| 13 | The legal rule of the state of law Regulation of public freedoms by public authorities Non-judicial litigation or grievance Judicial appeal, determining the state's responsibility for its legitimate actions |
| 14 | The impact of double judiciary on public freedoms - Public freedoms under administrative jurisprudence Equality: The historical development of the concept of equality |
| 15 | The modern development of the idea of equality - gender equality - Equality between individuals according to their beliefs and race |
| 16 | The concept of freedoms, classification of public freedoms Fundamental freedoms, intellectual freedoms, economic and social freedoms |
| 17 | Freedom, security and feeling of reassurance |

| | |
|----|---|
| | Freedom to come and go |
| 18 | Intellectual freedoms: freedom of opinion, freedom of belief Freedom of education |
| 19 | Freedom of the press Freedom of society |
| 20 | Anti-sabotage law Freedom of association |
| 21 | Freedoms with economic and social content Freedom of action |
| 22 | The right to own property |
| 23 | Freedom of trade and industry |
| 24 | women freedom |
| 25 | Political parties and public freedoms |
| 26 | Public freedoms in the world |
| 27 | Scientific and technical progress and public freedoms |
| 28 | The future of public freedoms |
| 29 | Democracy, its definition, types Concepts of democracy Democracy in the Third World |
| 30 | Democratic systems in the world |

Course Description Form

| | |
|--|--|
| Course Name: Electricity Technology | |
| Course Code: E.T | |
| Semester / Year: First/annual | |
| Description Preparation Date: 8/2/2024 | |
| Available Attendance Forms: Theoretical + practical lectures | |
| Number of Credit Hours (Total) / Number of Units (Total) : 90 | |
| Course administrator's name (mention all, if more than one name) | |
| Name: A.L. Abbas Fakery Email: abbas.alrubayie@atu.edu.iq | |
| Course Objectives | |
| Course Objectives | <ul style="list-style-type: none"> 1- Knowing the basic electric energy, its expected generation and distribution 2- Knowledge of the known global systems for energy transmission and generation 3- Knowing the electrical influence systems and calculating the losses from them 4- Performance by studying the lines of control over transactions 5- Knowledge of magnetic systems and principles of electric motors |
| Teaching and Learning Strategies | |

| | |
|-----------------|---|
| Strategy | 1- Building experience in the foundations of electrical power 2- Building experience in operating electric motors 3- Building experience in examining faults in electrical stations and laboratories. |
|-----------------|---|

Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------|-----------|-----------------------------------|--|--|--|
| 1-8 | Two Hours | Basics of electricity and systems | Electrical systems and basics | White board +D Show + Control Panel | Theoretical, practical, surprise exams and reports |
| 9-18 | Two Hours | Electrical control systems | Electrical control | White board +D Show + Control Panel | Theoretical, practical, surprise exams and reports |
| 19-24 | Two Hours | Troubleshooting | Fault diagnosis | White board +D Show + Control Panel | Theoretical, practical, surprise exams and reports |
| 25-27 | Two Hours | Occupational safety | Methods principles occupational safety | White board +D Show + Control Panel | Periodic reports maintenance |

Course Evaluation :

The degree is distributed

- 1- 20 marks for the first semester for practical.
- 2- 20 marks for the second semester for practical
- 3 - 10 marks for student activities
- 4 - 50 marks final exam

Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | <ul style="list-style-type: none"> - Basics of electricity, electrical units and symbols - Potential difference, Ohm's law, electromotive force, direct and alternating current |
| Main references (sources) | Lectures by the subject teacher, and there is prescribed textbook. Sources are books and Internet sources |
| Recommended books and references (scientific journals, reports...) | Electrical technology panel reports |
| Electronic References, Websites | Electronic scientific websites |

| Week | Vocabulary details |
|------|--|
| 1 | Electrical units and symbols, micro wattage, dc current, emf |
| 2 | Potential difference, Ohm's law, methods of connecting resistors (series, parallel, compound) |
| 3 | Potential difference, Ohm's law, methods of connecting resistors (series, parallel, compound) |
| 4 | Methods of obtaining alternating current, types of electric power plants |
| 5 | Sine wave, current waveform with time and frequency, definition of the effective value of alternating current and voltage. |
| 6 | Knowledge of power factors and operations, applications and examples of the use of alternating current in practical life. |
| 7 | Magnetic field, field properties, properties of magnetism, types of magnetic materials |
| 8 | The magnetic effect of electric current. Applications on the use of the property of the magnetic force of attraction |
| 9 | Single-phase alternating current, three-phase alternating current, phase sequence recognition method |
| 10 | Star (Y) connection method, phase current and line current of star, phase voltage and line voltage of star |
| 11 | Delta (Δ) connection method, phase current and line current in the case of delta connection, phase voltage and line voltage, power, applications and examples of star and delta connection. |
| 12 | Types of motors, three-phase induction motors, their types, and uses. |
| 13 | Installation of induction motors (tri-phase), principle of rotary magnetic field, principle of motor operation theory. |
| 14 | Methods of starting movement in three-phase induction motors |

| | |
|----|---|
| 15 | Methods of control and control in changing the speed of three-phase induct motors (changing poles, changing source voltage, changing oscillation, changin |
| 16 | Impact motors are one-sided, their types, installation, uses, and reverse cycles. |
| 17 | Single-unit capacitor-start impact motors, their installation and uses |
| 18 | Unilateral split-face motors, their installation and uses |
| 19 | Fuses, their types, melting coefficient |
| 20 | Cycle breakers, thermal monitor against overload. |
| 21 | Methods used to identify malfunctions: The engine is unable to rotate, the eng is rotating at a speed less than its ideal speed. |
| 22 | The engine temperature rises during rotation, the engine rotates noisily. |
| 23 | How to treat and repair each of the previous malfunctions. |
| 24 | Command and control circuits used to operate engines manually and automatically. |
| 25 | Engine maintenance methods, necessary time periods, and types of maintenanc |
| 26 | Oiling, lubricating, cleaning, axle bearings. |
| 27 | Industrial security, occupational safety during the maintenance process. |
| 28 | Study of the ohmmeter (AVO) and how to use it to measure electric curre potential difference and resistance. |
| 29 | Recognizing the terminology of the color resistance system |
| 30 | Connect resistors in series and parallel in an electrical circuit and find equivalent resistance for the measurement |

Course Description Form

| | |
|---|--|
| Course Name: Engineering Mechanics | |
| Course Code: E.M | |
| Semester / Year: First/annual | |
| Description Preparation Date: 8/2/2024 | |
| Available Attendance Forms: Theoretical + practical lectures | |
| Number of Credit Hours (Total) / Number of Units (Total) : 150 | |
| Course administrator's name (mention all, if more than one name) | |
| Name: A.L. Zahra Hammond Email: inb.zhr2@atu.edu.iq | |
| Course Objectives : | |
| Course Objectives | Introducing the student to the theoretical basics of statics, dynamics, and material resistance, which makes him capable and skilled in dealing in the field of mechanical techniques. |
| Teaching and Learning Strategies | |
| Strategy | <ol style="list-style-type: none"> 1- Calculate the resultant forces acting on the bodies 2- There is the center of gravity of different objects and shapes 3- Calculate the moment of inertia for different shapes 4- Applies the laws of motion to objects |

| Course Structure | | | | | |
|--|---------|---|---|------------------------------|------------------------|
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1-6 | 2n + 3p | Engineering statics | Forces torque, balance | Lectures | Daily exams |
| 7-10 | 2n + 3p | Friction | Types of friction preventive methods | Theoretical lectures | Pop quizzes discussion |
| 11-18 | 2n + 3p | Moment of inertia Engineering dynamics | Center of gravity moment of inertia | Theoretical lectures | Pop quizzes discussion |
| 19-25 | 2n + 3p | Energy and capacity Resistance of engineering materials | Work, energy and capacity Resistance of materials stresses | Discussion v students + exam | Daily exams |
| 26-30 | 2n + 3p | Shear stresses | Shear and bending diagrams | Theoretical lectures | Daily exams |
| Course Evaluation | | | | | |
| <p>The degree is distributed</p> <p>1- 20 marks for the first semester for practical.</p> <p>2- 20 marks for the second semester for practical</p> <p>3 - 10 marks for student activities</p> <p>4 - 50 marks final exam</p> | | | | | |
| Learning and Teaching Resources | | | | | |
| Required textbooks (curricular books, if any) | | | Lectures by the subject teacher, and there is no prescribed textbook. Sources are books and Internet sources | | |
| Main references (sources) | | | Electronic scientific websites . | | |
| Recommended books and references (scientific journals, reports...) | | | Engineering mechanics magazines for various si and entities . | | |
| Electronic References, Websites | | | 1-Scientific sources 2- Websites | | |

| Week No. | Subject Topics |
|----------|---|
| 1 | 1-Static, fundamental concepts , Force , Scalars and , Vectors , Units , Force polygon , Cartesian Components . |
| 2 | Analysis of Forces |
| 3 | Resultant of Concrrent , Coplanar Force system (2-D) |
| 4 | Moments |
| 5 | Couples , transformation of the Couple and the force |
| 6 | Resultant of non –Concurrent , Coplanar force system (3-D) . |
| 7 | Equillibrium , free body diagram (F.B.D.) |
| 8 | Equillibrium Conditions (2-D) |
| 9 | Equillibrium Conditions (3-D) |
| 10 | Friction, Dry Friction |
| 11 | Center of Gravity, Centriod (length, area), Centriod of Simple area |
| | |
| | |

| Week No. | Subject Topics |
|----------|--|
| 12 | Centroids of Composite areas. |
| 13 | Moment of inertia (Simple and Composite areas). |
| 14 | 2-Dynamics type of motion ,Linear motion with constant speed . |
| 15 | Linear motion with Constant acceleration . |
| 16 | Newton's Second Law |
| 17 | Curvilinear motion |
| 18 | Angular motion , Relative Motion . |
| 19 | Work , Energy, Power |
| 20 | 3-Strength of material :Fundamental concept,Loads , Stress , Strain , Elasticity , Plasticity, Deformation . |

| | |
|----|---|
| 21 | Hook's Law , Stress -strain curve, type of stress . |
| 22 | Normal stress due to an axial load on 1-Uniformam Cross section area 2- Variable cross section area . |
| 23 | Shear Stress |
| 24 | Torsional Stress |
| 25 | Thermal Stress |
| 26 | Beams , types of loads , types of beams . |
| 27 | Shear force (S.F.) & bending moment (B.M.) of Simple supported beam under an –axial load . |
| 28 | Shear force (S.F.) & bending moment (B.M.) of Simple supported beam under uniform distributed Load . |
| 29 | Shear force (S.F.) & bending moment (B.M.) of cantilever beam under an –axial load . |
| 30 | Shear force (S.F.) & bending moment (B.M.) of cantilever beam under uniform distributed Load . |

Course Description Form

| | |
|---|--|
| Course Name: Engineering Drawing | |
| Course Code: E.D | |
| Semester / Year: First/annual | |
| Description Preparation Date: 8/2/2024 | |
| Available Attendance Forms: Theoretical + practical lectures | |
| Number of Credit Hours (Total) / Number of Units (Total) : 90 | |
| Course administrator's name (mention all, if more than one name) | |
| Name: A.L. Nawal Abd Allah Email: nawal-omran@atu.edu.iq | |
| Course Objectives | |
| Course Objectives | Teaching and training students on methods of entering coordinates in different ways and drawing using AUTOCAD in two-dimensional space. |
| Teaching and Learning Strategies | |
| Strategy | 1- The skill of entering data using relative, polar, and absolute method 2- Helping him draw accurately with the possibility of choosing drawing paper 3- Learn and understand how to draw using different drawing commands 4- Learn and understand how to draw with different modification commands 5- Learn and understand how to draw using two-dimensional space |

| Course Structure | | | | | |
|--|-------|--|--|------------------------|-------------------|
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1-15 | 3 | The student learned drawing and modification instructions in AutoCAD | AUTOCAD 2D | Blackboard+ + Computer | Practical exams |
| 16-30 | 3 | Learn how to implement 2D graphics | Two dimensions | Blackboard+ computer | Practical exams |
| Course Evaluation | | | | | |
| <p>The degree is distributed</p> <p>1- 20 marks for the first semester for practical.</p> <p>2- 20 marks for the second semester for practical</p> <p>3 - 10 marks for student activities</p> <p>4 - 50 marks final exam</p> | | | | | |
| Learning and Teaching Resources | | | | | |
| Required textbooks (curricular books, if any) | | | Lectures by the subject teacher, and there is no prescribed textbook. Sources are books and Internet sources | | |
| Main references (sources) | | | Electronic scientific websites | | |
| Recommended books and references (scientific journals, reports...) | | | Scientific journals examining the topics drawing and engineering designs | | |
| Electronic References, Websites | | | 1-Scientific sources 2- Websites | | |

| Week | Vocabulary details |
|-------------|---|
| 1 | The importance of engineering drawing, the importance of using a computer to implement engineering drawing, standard drawing board sizes, an overview of the AutoCAD program. |
| 2 | Preparing for computer drawing Title Block |
| 3 | Drawing geometric shapes using the computer |
| 4 | Graphic modifications, computer drawing aids |
| 5 | |
| 6 | Types of lines for engineering drawing, engineering operations, dimensioning |
| 7 | |
| 8 | Perspective drawing, a perspective drawing containing a circle represented by an ellipse |
| 9 | |
| 10 | Projection theory, drawing simplified projections |
| 11 | |
| 12 | Main projections, 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. |
| 13 | |
| 14 | |
| 15 | Draw the three main projections at even angles and note the difference between them |
| 16 | |
| 17 | Conclusion of the third project from the two projects |
| 18 | |
| 19 | Inferring perspective from two or three projections |
| 20 | |
| 21 | Cutting theory, cutting shapes and lines according to the type of material, drawing cut plots |
| 22 | |
| 23 | Drawing projections cut from one specific projection |
| 24 | |
| 25 | Partially cropped project drawing |
| 26 | |
| 27 | Drawing a half-cut projection, drawing winding sections |
| 28 | |
| 29 | |
| 30 | |

Course Description Form

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| Course Name: Factor | |
| Course Code: F. | |
| Semester / Year: First/annual | |
| Description Preparation Date: 8/2/2024 | |
| Available Attendance Forms: practical | |
| Number of Credit Hours (Total) / Number of Units (Total) : 240 | |
| Course administrator's name (mention all, if more than one name) | |
| Name: A.L. Abbas fakery Email: abbas.alrubayie@atu.edu.iq | |
| Course Objectives | |
| Course Objectives | Discussing the practical side of the Mechanics Department/Product Branch and introducing the student to the most important mechanical workshops and learning about their many different types and technological methods used in arranging the lines of each workshop according to the sequence of steps in making the works for each workshop |
| Teaching and Learning Strategies | |
| Strategy | <ol style="list-style-type: none"> 1- Introducing the student in general to the practical side of the Mechanical Technologies Department 2- Introducing the student to the mechanical workshops in his surroundings and knowing their types 3- Introducing the student to the types of machines present in each workshop according to the sequence of steps in making the works for each workshop |

to the sequence of their importance in producing various artifacts
 4- The student will be able to stand on the machine, manage it successfully, and learn about ways to maintain it
 5- The student is able to know the problems that occur in the production process and how to find logical solutions to them.

Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------------|--------------|-----------------------------------|--------------------------------------|------------------------|--------------------------|
| 1-3 | 8 | Plumbing workshop | Plumbing foundation | Practical | Practical tests in week |
| 3-6 | 8 | Carpentry workshop | Carpentry operations | practical | Practical tests in week |
| 6-9 | 8 | Welding workshop | Ancient and modern welding processes | practical | Practical tests in week |
| 9-12 | 8 | Lathe workshop | Sequential turning operations | practical | Practical tests in week |

Course Evaluation:

Continuing education

Learning and Teaching Resources

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| Required textbooks (curricular books, if any) | Customized curricula for the laboratory unit |
| Main references (sources) | References and sources for each workshop |
| Recommended books and references (scientific journals, reports...) | Periodic reports and field visits to laboratories and factories |
| Electronic References, Websites | Various internet sites |

| Practical vocabulary | |
|-----------------------------|---|
| Weekly | vocabulary details |
| First | <p>1- Model carpentry (3 weeks)</p> <p>1-The basic principles of model carpentry, definition of types of wood and their uses, types of models, 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 the 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 thickening machine, the tray saw, the band saw, the raking machine, the sanding machine, the converter.</p> <p>4-Practical training for attaching parts according to the operational drawing on the marks.</p> |
| second | Completing the training, finishing the parts of the model, methods of assembling it, and its final dimensions. |
| third | Complex models: explanation of multiple dividing boundaries and internal spaces. |

| Practical vocabulary | |
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| Weekly | vocabulary details |
| first | <p>2- Metal Plumbing (6 weeks)</p> <p>- Metal casting and its importance, the purpose of using castings in industry, contents of the casting unit, industrial safety precautions in casting, forming a sand mold for a one-piece model in front of the students, sand for molds and cores, their types and sources, properties of additives, mixing processes and controlling quantities, use of a sand mixer, sand treatment.</p> <p>- Forming sand molds using manual methods for a one-piece model to form a sand mold.</p> |
| second | Sand mold for a one-piece model with identification of castings and risers, melting metal and pouring it into a mold, extracting and cleaning the castings. |

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| third | Forming a sand mold as before, melting the metal, pouring it into a mold, taking out the casting and cleaning it. |
| forth | 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. |
| fifth | Casting sand molds for moving and compound models with a core. These exercises are among the exercises that the student will perform to complete their operation in other laboratories |
| sixth | Metal smelting furnaces, their types, characteristics, uses, rotary, stirrer, and stationary furnaces. |
| first | -Refrigeration and maintenance (6 weeks) 1- Industrial development and the role of the refrigerator in it. 2- The veneer foot, its types, measurement methods, how to make a veneer that reads the depth gauge, and the calipers. 3-The Shankara process 4- Foundation surfaces, tools used, display materials, impact fork, straight calipers, chisel calipers, tailbone and tailbone, right angles, chisel flowers, regular and sensitive chinks, altimeter, universal protractor and angle measurement, 5- A practical exercise that combines chicane operations. 6- Files and cold process 7-Types of files and their specifications, components and their types, and methods of attaching the crafts and their work. |
| | 1- Uses of files, how to clean files, the process of filing, practice on a hook and a simple file. |

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| second | <p>2- Cutting with a saw</p> <p>3- The hand saw, the saw weapon, installing the saw weapon, the conditions that must be met in sawing, an exercise in the saw cutting process.</p> |
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| third | <p>1- Gerification process Types of embryos, tooting and maintenance of embryos, types of manual hammer heads, method of installing the hammer head, exercise on the embryo process.</p> <p>2-The process of drilling and glazing 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 Types of screws, internal and external dental tables, training on performing different screwing operations.</p> |
| forth | Various training exercises on the previously mentioned filing work. |
| fifth | The importance of maintenance for machines and equipment, clarification of periodic and comprehensive maintenance operations, and how to prepare maintenance reports. |
| sixth | <p>1-Types of gaskets and sealants, their uses, methods of installing and removing them, and reviewing their operation</p> <p>2-Types of valves, methods of operation, inspection and repair.</p> |
| first | <p>-Welding (6 weeks)</p> <p>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 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.</p> |
| | Practical exercises: |

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| second | Welding opposite surfaces, perpendicular surfaces, inclined surfaces, circle welding, longitudinal and transverse cutting Welding equipment, practical training on the use of electric arc in welding various surfaces, |
| third | Equipment used, electrodes and how to install them, practical training. |

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| forth | Welding using CO2 gas and gas cutting operations, equipment used and precautions to be taken Performing exercises on welding artifacts using CO2 gas |
| fifth | Training in gas-shielded arc welding (Tig, Mig). |
| sixth | Assembly exercises using various cutting and welding processes. |
| first | 5-Plumbing and blacksmithing (3 weeks) Equipment for cutting and bending billets, rolling machine, grooving machine and manual tools, using and bending the billet manually, regular thruster, list and drawing method, simple discretization, calculating the individual cut and missing actuators. |
| second | Training on calculating the individual intersecting works, performing an exercise for two intersecting cylinders. |
| third | Singular cones and conic ellipses. |
| first | 6-Lathing (6 weeks) The lathe, its specifications, uses, accessories, installation methods, operating the lathe, types of lathe pens using each of them. |
| | Lathing operations: Plane lathe, tool, center work, simple step drill, use of measuring |

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| second | tools. |
| third | Mapping the external looting in different ways, explaining the laws for each method, and doing an exercise specifically for the external looting. |
| forth | 1- Externally working on the different teeth (the triangle). Doing an exercise that includes the triangle tooth 2- Make the tooth an outer square and make an exercise. |

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| fifth | Cutting speeds, selecting them, and using their tables. |
| sixth | Implementing training on decentralized turning and using quadrilateral sampling. |

Course Description Form

| Course Name: Manufacturing Processes | | | | | |
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| | | | | | |
| Course Code: M.P | | | | | |
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| Semester / Year: First/annual | | | | | |
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| Description Preparation Date: 8/2/2024 | | | | | |
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| Available Attendance Forms: Theoretical + practical lectures | | | | | |
| | | | | | |
| Number of Credit Hours (Total) / Number of Units (Total) : 120 | | | | | |
| | | | | | |
| Course administrator's name (mention all, if more than one name) | | | | | |
| Name: A.L. Nawal Abd Allah Email: nawal-omran@atu.edu.iq | | | | | |
| Course Objectives | | | | | |
| Course Objectives | | | The student understands the processes and how to use measuring devices and tools (such as a perforator, micrometer, and ruler), as well as devices for measuring permeability, humidity, durability, hardness, and adjustment for all metals. The student learns how to use these devices in practical life. | | |
| Teaching and Learning Strategies | | | | | |
| Strategy | | 1- The skill of using the measurement process, a veneer, and a ruler 2- Use humidity and permeability measuring devices and plumbing devices 3- How to use and understand hardness and durability measuring devices | | | |
| Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1-10 | 2n + 2p | Measuring devices | Comparison devices | Theoretical practical | Snap tests |

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|--|---------|--------------------|---|-----------------------|------------------|
| 10-15 | 2n + 2p | Shankara | The filings | Theoretical practical | Discussion class |
| 16-30 | 2n + 2p | Forming operations | Welding and forming | Theoretical practical | Discussion class |
| Course Evaluation | | | | | |
| <p>The degree is distributed</p> <p>1- 20 marks for the first semester for practical.</p> <p>2- 20 marks for the second semester for practical</p> <p>3 - 10 marks for student activities</p> <p>4 - 50 marks final exam</p> | | | | | |
| Learning and Teaching Resources | | | | | |
| Required textbooks (curricular books, if any) | | | Lectures by the subject teacher, and there no prescribed textbook. Sources are books and Internet sources . | | |
| Main references (sources) | | | Electronic scientific websites | | |
| Recommended books and references (scientific journals, reports...) | | | Weekly reports submitted by students. | | |
| Electronic References, Websites | | | 1-Scientific sources 2- Websites | | |

| Theoretical vocabulary | |
|-------------------------------|--|
| the first | Definition of measurement and units of measurement, error and its causes, methods of measuring main dimensions, simple conveyor measuring devices. |
| the second | Measuring feet (probes), their parts, uses, and types. |
| the third | Micrometers, their types, uses, parts, and the idea of how a micrometer works. |
| the fourth | Measuring molds and their uses, types, and how to use them. |
| Fifth | Measuring angles and side shapes, tools for measuring angles and measuring cups (debar) and their types |

| week | Vocabulary details |
|-------------|--|
| sixth | Method of measuring screw elements, external and internal diameters, measuring step and step diameter, electronic mechanical comparison devices. |
| Seventh | Optical device, some modern measurement methods (acoustic frequency measuring devices, digital optical). |
| eighth | 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 crafts to them, the uses of files, the method of cleaning files. |
| Ninth | 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 tenth | Drilling and grinding, types of drills, types of primers, types of primers, how to perform the drilling and grinding process. |
| eleveth | Models, their types, wood used in their manufacture, and the conditions that must be met in the model. |
| twelfth | Tools and devices used in making the model, box molds, and how to design a simple model. |
| Thirteenth | Plumbing, historical overview, main methods of plumbing (cast casting, sand casting, metal mold casting, other methods of plumbing) Advantages of the plumbing process. |
| fourteenth | Plumbing sand, plumbing sand specifications, components, plumbing sand, devices used and additives to plumbing sand. |
| Fifteenth | Dumps and tools used in preparing sand molds, the process of molding a simple and final model, the parasitic molds and the model molds used. |
| sixteen | Pulp, its types, pulp sand, mixture ratios and materials added to it, stages of its work (mixing and preparing sand, making balls, drying it), the benefit of the drying process, ovens or methods of drying balls and their equipment. |

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| seventeenth | Casting with metal molds, its types, centrifugal casting, and its types. |
| eighteen | Lost wax plumbing, continuous plumbing, shell plumbing. |
| week | Vocabulary details |
| nineteenth | Metal smelting and its foundations, types of smelting furnaces, blast furnace, main dimensions and method of operation, blast furnace, electric arc furnace, reflector furnace, rotary furnace. |
| The twentieth | Casting of castings, its equipment and foundations, cleaning of castings, casting defects, inspection of castings. |
| 21st | 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. |
| twenty tow | 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. |
| twenty third | Fusion welding and gas welding, oxy-hydrogen welding and oxy-acetylene welding, types of flame, right-hand welding and left-hand welding, cutting with oxy-acetylene. |
| twenty fourth | Arc welding, welding current, direct and reverse polarity method, types of electrodes, packaging of metal electrodes and their types. |
| 25th | Electrode movement, methods of isolating electrodes and the welding area, electric arc welding using protective gases (carbon dioxide welding, acorn tig welding, brazing welding) |
| twenty-sixth | Atomic hydrogen arc welding, arc welding, fusion welding. |
| 27th | Temperature welding, caustic welding (mortar welding, plumbing welding) and some modern types of welding (laser welding, electron beam welding). |
| Twenty- | Welding defects, welding tests. |

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| Twenty-ninth | Metal forming, the theory of forming, the foundations of cold and hot forging, blacksmithing, the foundations of blacksmithing and its methods (manual, mechanical), blacksmithing equipment, manual and mechanical, blacksmithing elements. |
| thirty | Special blacksmithing methods, blacksmithing molds and their manufacture, effective force, explanation of the different blacksmithing operations (contact, methods of different geometric sections in cutting operations, making simple steps, forming various artifacts). |

Course Description Form

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| Course Name: Mathematics | |
| Course Code: M. | |
| Semester / Year: First/annual | |
| Description Preparation Date: 8/2/2024 | |
| Available Attendance Forms: Theoretical lectures | |
| Number of Credit Hours (Total) / Number of Units (Total) : 60 | |
| Course administrator's name (mention all, if more than one name) | |
| Name: L. Najlaa Shaker Aziz Email: najlaa.shemery@atu.edu.iq | |
| Course Objectives | |
| Course Objectives | How to use mathematical functions and their scope of application, addition to how to analyze, conclude, tabulate and organize data in frequency tables and how to display them in graphical charts, in addition to studying probability to reach the best decision. |
| Teaching and Learning Strategies | |
| Strategy | <ol style="list-style-type: none"> 1- The skill of using mathematical functions in applied aspects 2- The skill of organizing and tabulating data into tables, analyzing it, and putting it into graphs 3- Using probability to reach the optimal solution |

| Course Structure | | | | | |
|--|--------|---|---|-----------------|-------------------------|
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1-9 | 2 hour | Learn the laws of differentiation | Determinants and differentiation | the blackboard | Homework surprise exams |
| 10-15 | 2 hour | Mathematical functions and ways to solve them | Indefinite integration | the blackboard | Homework surprise exams |
| 16-30 | 2 hour | Laws of definite integration | Vectors statistics and probability | the blackboard | Homework surprise exams |
| Course Evaluation | | | | | |
| <p>The degree is distributed</p> <p>1- 20 marks for the first semester for practical.</p> <p>2- 20 marks for the second semester for practical</p> <p>3 - 10 marks for student activities</p> <p>4 - 50 marks final exam</p> | | | | | |
| Learning and Teaching Resources | | | | | |
| Required textbooks (curricular books, if any) | | | Subject teacher's lectures are printed Mathematics- Dr. Qasim's assistant book and internet sources . | | |
| Main references (sources) | | | Electronic scientific websites | | |
| Recommended books and references (scientific journals, reports...) | | | Providing various examples and questions students in the form of reports | | |
| Electronic References, Websites | | | 1-Scientific sources 2- Websites | | |

| Weekly | Practical vocabulary |
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| the first and the second | Determinants and their properties, solving simultaneous equations using the determinant method (Cramer). |
| Third, fourth and fifth | , differentiation, algebra of derivatives, multiple functions |
| Sixth, seventh and eighth | Trigonometric, logarithmic and exponential functions and their derivatives and implicit functions, the chain rule. |
| The ninth, tenth, and eleventh | drawing of functions, drawing of the trigonometric function, and maximum and minimum limits. |
| Twelfth and thirteenth | : Physical differential applications, velocity and acceleration, and geometric differential applications. |
| Fourteenth and fifteenth: | Integration, laws, and its relationship to differentiation, definite and indefinite integration. |
| Sixth, seventh, eighth, and nineteenth | : Implicit integration, geometric applications of integration (areas and volumes) and physics. |

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| Weekly | vocabulary details |
| Twenty and twenty-first | , general methods of integration, substitution and partial integration, and the use of exponential and logarithmic partial fractions. |
| The third, fourth, fifth, and twenty-sixth, | discrete, homogeneous, and linear differential equations with their various applications. |
| Twenty-seventh and twenty-eighth: | Vectors (direct and quantitative multiplication and calculating angles between vectors. |
| Twenty-nine and thirty | Statistics (principles) and probability theory |

Course Description Form

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| Course Name: Computer Applications | |
| Course Code: C.A | |
| Semester / Year: First/annual | |
| Description Preparation Date: 8/2/2024 | |
| Available Attendance Forms: Theoretical + practical lectures | |
| Number of Credit Hours (Total) / Number of Units (Total) : 90 | |
| Course administrator's name (mention all, if more than one name) | |
| Name: P. Rakia Jawed Email: raqeyah.najy@atu.edu.iq | |
| Course Objectives | |
| Course Objectives | The student understands what is meant by a computer, the types computers and their development over generations. He also learns about the types of data and how to enter them into the computer system through operating systems. |
| Teaching and Learning Strategies | |
| Strategy | 1-Learning about the operating system 2-Learn how to create a folder 3- Identify the CONTROL PANEL icon 4- Data entry skills using relative and polar methods 5-Learn drawing and editing commands |
| Course Structure | |

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------|---------|--|---|-----------------------|-------------------------|
| 1-8 | 1n + 2p | Computer se, software | Calculator generations and entry methods | the blackboard | Surprise practical exam |
| 9-13 | 1n + 2p | Computer security...electronic hacking | The most common security problems | White board+DATA | Surprise practical exam |
| 14-16 | 1n + 2p | Windows 7 applications folders, files, icons | Windows 7 operating system | White board+DATA SHOW | Surprise practical exam |
| 16-30 | 1n + 2p | PowerPoint applications menus, icons | Microsoft Word operating system + PowerPoint operating system | White board+DATA SHOW | Surprise practical exam |

Course Evaluation

The degree is distributed
 1- 20 marks for the first semester for practical.
 2- 20 marks for the second semester for practical
 3 - 10 marks for student activities
 4 - 50 marks final exam

Learning and Teaching Resources

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| Required textbooks (curricular books, if any) | : Computer Basics and its Office Applications (Part One and Two) - Prof. Dr. Ghassan Hamid Abdel Majeed and others Ministry of Higher Education and Scientific Research – Iraq |
| Main references (sources) | Electronic scientific websites |
| Recommended books and references (scientific journals, reports...) | Preparing reports on the representation of geometric shapes . |
| Electronic References, Websites | 1-Scientific sources 2- Websites |

| Vocabulary details | week |
|---|-------------|
| Evolution of computer generations | First |
| II computer components, physical parts, software | Second |
| Types of computers, by purpose, by size and performance, by data type, by operating systems | Third |
| preparation systems, computer features | Fifth |
| Ethics of the electronic world, forms of excesses | Fifth |
| Computer security, computer licenses, computer privacy | Six |
| Types of licenses, intellectual property | Seven |
| Electronic penetration, types of penetration, sources of penetration | Eight |
| The most widespread security problems | Nine |
| Computer viruses, damage caused by the virus | Ten |
| Characteristics of viruses, components of the virus, types of virus | Eleven |
| Necessary steps to protect against hacks | Twelve |
| Computer damage to health | thirteenth |
| Applications | Fourteenth |
| Applications | Fifteenth |
| Definition of the operating system, OS functions | Sixteenth |
| Operating system objectives, classification of operating systems | Seventeenth |
| Examples of some operating systems | Eighteenth |

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| Windows 7 operating system, installation requirements | Nineteenth |
| Features of Windows 7, desktop components | Twenty |
| Start menu, taskbar, notification area | Twenty-First |
| Folders, files, icons | Twenty-second |
| Window operations, desktop wallpapers | Twenty-third |
| Control panel, auxiliary instructions | Twenty-fourth |
| Some common situations and settings in the computer | Twenty-fifth |
| Microsoft Word operating system | Twenty-sixth |
| Microsoft Word interface, menus | Twenty-seventh |
| Rosters | Twenty-eighth |
| PowerPoint system | Twenty-ninth |
| PowerPoint lists | Thirtieth |

Course Description Form

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| Course Name: Material Properties | |
| | |
| Course Code: M.P | |
| | |
| Semester / Year: First/annual | |
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| Description Preparation Date: 8/2/2024 | |
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| Available Attendance Forms: Theoretical lectures | |
| | |
| Number of Credit Hours (Total) / Number of Units (Total) : 60 | |
| | |
| Course administrator's name (mention all, if more than one name) | |
| Name: L. Mohammed Ali Jabir Email: mohammed.dakhil@atu.edu.iq | |
| Course Objectives | |
| Course Objectives | Teaching and training students to recognize physical and mechanical properties, how to conduct tests using Brunel and impact tests, stresses metals, and the use of chemical paint for metals. |
| Teaching and Learning Strategies | |
| Strategy | 1- Identify the physical properties of metals 2- Identify the mechanical properties of metals 3-How to use chemical paint for metals 4-How to conduct tests for metals . |

| Course Structure | | | | | |
|--|--------|---|--|-------------------------|-----------------------|
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1-10 | 2hours | The most important physical and mechanical properties of metals | Properties of metals | Blackboard DATA SHAW | Weekly surprise tests |
| 10-15 | 2hours | Metal smelting furnaces | Methods of manufacturing metals and alloys | Blackboard DATA SHAW | Weekly surprise test |
| 16-30 | 2hours | Iron and its alloys | Properties of steel | Blackboard DATA SHAW | Weekly surprise test |
| Course Evaluation | | | | | |
| <p>The degree is distributed</p> <p>1- 20 marks for the first semester for practical.</p> <p>2- 20 marks for the second semester for practical</p> <p>3 - 10 marks for student activities</p> <p>4 - 50 marks final exam</p> | | | | | |
| Learning and Teaching Resources | | | | | |
| Required textbooks (curricular books, if any) | | | Subject teacher lectures | | |
| Main references (sources) | | | Electronic scientific websites | | |
| Recommended books and references (scientific journals, reports...) | | | Weekly reports submitted by students | | |
| Electronic References, Websites | | | <p>1-Scientific sources</p> <p>2- Websites</p> | | |

| Week No. | Subject Topics |
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| 1 | Definition of engineering materials. |
| 2 | Atom, element, types of bonds in engineering materials. |
| 3 | Crystalline and amorphous materials. |
| 4 | Crystal forms: H.C.P, F.C.C, and B.C.C. |
| 5 | Mechanical properties of materials: Stress, strain, stress-strain curve, ductility, and failure. |
| 6 | Hardness, hardness test. |
| 7 | Complement. |
| 8 | Toughness and toughness test |
| 9 | Thermal properties of materials: Thermal expansion and thermal conductivity. |
| 10 | Electrical properties of materials: Ionic materials, insulating materials, metallic materials, and factors affecting conductivity. |
| 11 | Magnetic properties of materials: Ferromagnetic materials, paramagnetic materials, diamagnetic materials, magnetic retardation, and factors affecting magnetism. |

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| 12 | Chemical properties of materials: Corrosion, electrochemical series, and oxidation. |
| 13 | Iron, its most important ores, extraction, blast furnace, and transformers. |
| 14 | Carbon steel, its most important types, properties, and uses. |
| 15 | Alloy steel, its most important types, properties, and uses. |
| 16 | Cast iron, its types, properties, and uses. |
| 17 | Complement. |
| 18 | Copper, its alloys, properties, and uses. |
| 19 | Aluminum, its alloys, properties, and uses. |
| 20 | Nickel, its alloys, properties, and uses. |
| 21 | Tin, its alloys, properties, and uses. |

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| | Zinc, its alloys, properties, and uses. Manganese, its alloys, properties, and uses. |
| 22 | Other nonferrous alloys (white metals, bearing alloys) |
| 23 | Powder metallurgy: Methods of obtaining metal powders, mechanical methods, physical and chemical methods, natural, mechanical and chemical properties of powders. |
| 24 | Powder pressing and sintering process. |
| 25 | Ceramic materials. |
| 26 | Glass, its types, manufacture, and uses. |
| 27 | Concrete, its industrial uses. |
| 28 | Polymers, polymer molecules, and types of polymers. |
| 29 | Properties and uses of plastics. |
| 30 | Plastics Complement. |

Course Description Form

| Course Name: English Language | | | | | |
|--|----------|--|---|----------------------|---------------------------------|
| Course Code: E.L | | | | | |
| Semester / Year: First/annual | | | | | |
| Description Preparation Date: 8/2/2024 | | | | | |
| Available Attendance Forms: Theoretical lectures | | | | | |
| Number of Credit Hours (Total) / Number of Units (Total) : 30 | | | | | |
| Course administrator's name (mention all, if more than one name) | | | | | |
| Name: A.L Asmaa Adnan Email: asmaa.najm@atu.edu.iq | | | | | |
| Course Objectives | | | | | |
| Course Objective | | | Teaching and training the student to recognize the basics of English language : | | |
| | | | 1 - Learn about composition writing skills . | | |
| | | | 2- Mastering the skill of conversation . | | |
| Teaching and Learning Strategies | | | | | |
| Strategy | | 1-Recognize welcome phrases 2- Identify the conversation 3-How to use verb tenses 4- How to differentiate between adjectives, nouns and verbs . | | | |
| Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1-10 | One hour | Mastery of the English language | Welcome and introduction in English | Theoretical lectures | Test at the end of each lecture |

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|-------|----------|---------------------------------------|---------------------------------------|--|---------------------------------|
| 10-15 | One hour | Mastery of the English language | Pronouns and prepositions | listening Theoretical lectures listening | Test at the end of each lecture |
| 16-30 | One hour | Countries, capitals and nationalities | Countries, capitals and nationalities | Theoretical lectures listening | Test at the end of each lecture |

Course Evaluation

The degree is distributed

1- 20 marks for the first semester for practical.

2- 20 marks for the second semester for practical

3 - 10 marks for student activities

4 - 50 marks final exam .

Learning and Teaching Resources

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| Required textbooks (curricular books, if any) | Subject teacher lectures + Head way book |
| Main references (sources) | Electronic scientific websites |
| Recommended books and references (scientific journals, reports...) | English-language magazines that effectively support the curriculum . |
| Electronic References, Websites | 1-Scientific sources 2- Websites |

| WEEK | CONTENTS |
|------|------------|
| 1 | Hello |
| 2 | Your World |

| | |
|----|----------------------|
| 3 | Personal Information |
| 4 | Family and Friends |
| 5 | It's my life |
| 6 | Every day |
| 7 | Places I Like |
| 8 | Where I live |
| 9 | Happy Birthday |
| 10 | We Had a Good Time |
| 11 | We Can Do It |
| 12 | Thank You Very Much |
| 13 | Here and Now |
| 14 | It's Time To Go |
| 15 | Grammar Reference |

(Reference) :

1- New Headway Book

2- Beginner Students Book

Course Description Form

| 13. Course Name: Baath Party Crimes | | | | | |
|--|--------------|---|-----------------------------|------------------------|--------------------------|
| | | | | | |
| 14. Course Code: B.P.C | | | | | |
| | | | | | |
| 15. Semester / Year: Second/annual | | | | | |
| | | | | | |
| 16. Description Preparation Date 8/2/2024 | | | | | |
| | | | | | |
| 17. Available Attendance Forms: Theoretical lectures | | | | | |
| | | | | | |
| 18. Number of Credit Hours (Total) / Number of Units (Total) : 60 | | | | | |
| | | | | | |
| 19. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: A.L Mustafa Mohammed Email: Mustafa.Mohammed.iba4@atu.idu.iq | | | | | |
| 20. Course Objectives | | | | | |
| Course Objectives | | <p>a. Developing the student's organized logical thought.</p> <p>B. Highlighting the most important reasons for the fall of the Baath Pa regime and the heinous crimes it committed against the Iraqi people.</p> <p>C. Developing ideal attitudes and values and instilling the spirit of humanity, tolerance and patriotism in the student.</p> | | | |
| 21. Teaching and Learning Strategies | | | | | |
| Strategy | | <ul style="list-style-type: none"> - Theoretical lectures - Discussions for students regarding the subject | | | |
| 22. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |

| | | | | | |
|-------|--------|--|--|----------------------------------|---|
| 1-10 | 1 hour | Being able to know the general concept of crimes linguistically and terminologically | The term crimes language and concepts | Theoretical lectures + listening | Test at the end of each lecture + student discussion |
| 10-15 | 1 hour | Identify the different types of crimes and their psychological and social effects | Psychological crimes and social crimes | Theoretical lectures + listening | Student discussion Test at the end of each lecture |
| 16-30 | 1 hour | The most important unjust decisions against the Iraqi people | Violations of Iraqi laws and their most prominent unjust forms | Theoretical lectures + listening | Test at the end of each lecture |

23.

Course Evaluation

The degree is distributed

1- 20 marks for the first semester for practical.

2- 20 marks for the second semester for practical

3 - 10 marks for student activities

4 - 50 marks final exam

24.

25. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | A methodological book (Crimes of the Baath Regime in Iraq) + lectures by the subject teacher |
| Main references (sources) | Reliable sources approved by the Ministry of Higher Education and Scientific Research |
| Recommended books and references (scientific journals, reports...) | Diverse cultural sources effectively support curriculum |
| Electronic References, Websites | 1-Scientific sources 2- Websites |

| Week | Curriculum vocabulary |
|------|--|
| 1 | The concept of crimes linguistically and terminologically Crime departments |
| 2 | Types of international crimes |

| | |
|----|---|
| 3 | Decisions issued by the Supreme Criminal Court |
| 4 | Psychological and social crimes and their effects, and the most prominent |
| 5 | violations of the Baathist regime in Iraq |
| 6 | Psychological crimes, mechanism of psychological crimes |
| 7 | The mechanism of pressure and psychological punishment / the mechanism of scientific impoverishment / the effects of psychological crimes |
| 8 | Social crimes, first section |
| 9 | Social crimes, section two |
| 10 | Violations of Iraqi laws and their forms, Section One |
| 11 | Violations of Iraqi laws and their forms, Section Two |
| 12 | Some decisions regarding political and military violations of the Baath regime |
| 13 | Prison and detention places of the Baath regime |
| 14 | Environmental crimes of the Baath regime |
| 15 | Environmental crimes in Basra |
| 16 | Contamination with radioactive materials / Halabja |
| 17 | Destruction of cities and villages |
| 18 | The battle of the Jassim River and the burning of oil wells |
| 19 | Drying the marshes |
| 20 | Demolishing palm groves, trees and crops |
| 21 | Introduction to mass grave crimes |
| 22 | Incidents of genocide graves committed by the Baathist regime/events of 1963 |
| 23 | Introduction to the events spanning the years 2003-1979 and their relationship to mass graves. |
| 24 | The events of the Iran-Iraq War 1980-1988 AD and their relationship to mass graves |
| 25 | The events of 1988-1987 and their relationship to mass graves |
| 26 | The events of the Shaabani uprising in 1991 AD and their relationship to mass graves |
| 27 | Genocide graves related to the Iran-Iraq War for the period 1980-1988 AD: |
| 28 | Graves of the genocide of the Barzanian Kurds in 1983 |
| 29 | Genocide graves of the 1991 Shaabaniya uprising, first section |
| 30 | Genocide Graves of the 1991 Shaabaniya Uprising, Section Two |

Course Description Form

| |
|--|
| 1. Course Name: Project |
| |
| 2. Course Code: P. |
| |
| 3. Semester / Year: Second/annual |
| |
| 4. Description Preparation Date: 8/2/2024 |
| |
| 5. Available Attendance Forms: Theoretical lectures and discussions with the project supervisor + field visits to the site for implementing and completing the project work . |
| |
| 6. Number of Credit Hours (Total) / Number of Units (Total) : 30 |
| |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: A.P. Zuher Hassan Abdullah Email: inb.zuher74@edu.atu.iq |
| Name: A.T. Nawal Abd Allah omran EMAIL: nawal_omran@atu.edu.iq |
| Name: L. Najlaa Shaker Aziz Email: najlaa.shemery@atu.edu.iq |

Name A.T Zehra hmoad
 Email: inb.zhr2@atu.edu.iq

Name: A.T Zianab Abd Al Abbas
 Email: zainabalnamey68@gmail.com

8. Course Objectives

Course Objectives

- The student becomes able to create and create various types and shapes of designs and manufacture and assemble models in an accurate and organized scientific manner.
- Expanding and developing the student's capacity for imagination, creativity, and implementation.

9. Teaching and Learning Strategies

Strategy

The organization's workshops and laboratories and conducting practical experiments and various field practices in order to reach and achieve the goal.

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------|---------|---|--|---|---|
| 1-4 | 4 hours | Search for sources that are important to the project Identify the different parts of the project | topic. Introduction of the project + importance of project | Collect various information about project topic | Continuous discussion with students supervisor follow-up |
| 5-14 | 4 hours | Research the theoretical part of the project | Writing the theoretical part of the project | Directions of project supervisor | Continuous discussion with students supervisor follow-up |
| 15-20 | 4 hours | Research the theoretical part of the project | Writing the practical part of the project | | Continuous discussion |

| | | | | | |
|-------|---------|---|---|--|--|
| 20-30 | 4 hours | of the practical part of the project Collect information for the purpose of discussing project results | part of the project V Discussing project results | Preparing all necessary materials and tools to complete practical part of the project Researching most important results extracted from the project under supervision of the supervisor/teacher | with students supervisor follow-up Continuous discussion with students supervisor follow-up |
|-------|---------|---|---|--|--|

11. Course Evaluation

The degree is distributed

- 1- 30 marks for the first semester for practical.
- 2- 30 marks for the second semester for practical
- 3 - 10 marks for student activities
- 4 - 30 marks final exam

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | Scientific sources directly related to the project topic selected and directed by the supervisor and project students |
| Main references (sources) | Books and scientific sources directly related to the project topic |
| Recommended books and references (scientific journals, reports...) | Scientific journals that address the practical and theoretical aspects of the project |
| Electronic References, Websites | Various scientific Internet sites that are directly related to the essence of the project topic |

Practical vocabulary

| | |
|-----------------------------|--|
| first | Discussing the projects that are being tested and determining the method and plan of work. |
| second | Defining and distributing responsibilities and setting a timetable for project implementation. |
| third | Preparing drawings and operating cards for the various mechanical laboratories related to the project's parts. |
| Fourth-Fourteenth: | Implementing the project in the laboratory units and preparing reports on the stages that have been reached, along with weekly follow-up of the work progress of production rates and operating obstacles. |
| Fifteenth: | Discussion of students by a committee and evaluation of implementation plans for the best (this is considered an evaluation for the end of the first semester). |
| Sixteenth - Twenty-seventh: | Resuming the implementation of the project paragraphs and completing the practical aspect |
| Twenty-eighth: | Discussing the details of the project and directing students to prepare the report in its final form (it is considered an evaluation of the second semester). |
| Twenty-nine: | Completing the project, both its theoretical and practical aspects, and preparing for the final discussion |
| Thirty | final discussion of the project |

Course Description Form

| | |
|--|---|
| 1. Course Name: Industrial Drawing | |
| 2. Course Code: I.D | |
| 3. Semester / Year: Second/annual | |
| 4. Description Preparation Date: 8/2/2024 | |
| 5. Available Attendance Forms: Theoretical lectures + applied training/computer training | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) : 90 | |
| 7. Course administrator's name (mention all, if more than one name) Name: A.T. Zainab Abd Al Abbas Email: zainabalnamey68@gmail.com | |
| 8. Course Objectives | |
| Course Objectives | <p>Teaching the student to draw mechanical parts</p> <p>Teaching students how to assemble mechanical parts</p> <p>Teaching the student the rules and dimensions needed to draw a mechanical part</p> <p>Teaching the student to cut assembled parts and how to split them</p> <p>Teaching the student to project the combined figure</p> <p>Teaching the student to draw three-part mechanical parts assembled</p> <p>Teaching the student to read the mechanical part and sort it into design or blocks.</p> |
| 9. Teaching and Learning Strategies | |
| Strategy | <ul style="list-style-type: none"> -Theoretical lectures - 2- Practical applications - 3- Use DATA-SHOW - 4- Use AUTO CAD program. |

| | |
|--|--|
| | |
|--|--|

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------|--------|--------------------------------------|-----------------------------|-------------------------|---------------------|
| 1-2 | 3hours | Review informati | Drop and cut. | Blackboard + | Practical exercise |
| 3-13 | 3hours | Mechanical p drawing and design | Drawing of mechan parts. | DATA SHOW Blackboard | Practical exercises |
| 14-26 | 3hours | Drawing mechanical assemblies. | Assembling mechan parts. | + DATA SHOW | Semester exam |
| 27-30 | 3hours | Complex group exercises. | Complex group exercises. | | Surprise exams |

11.

11.Course Evaluation

The degree is distributed

1- 20 marks for the first semester for practical.

2- 20 marks for the second semester for practical

3 - 10 marks for student activities

4 - 50 marks final exam

12. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | Drawing and design books Educational bag |
| Main references (sources) | Electronic scientific websites |
| Recommended books and references (scientific journals, reports...) | -Scientific sources 2- Websites |
| Electronic References, Websites | Continuing education courses |

| | |
|---------------------------|--|
| The first week | A general review of first grade topics: geometric lines, projections, and sections. Setting dimensions using AutoCAD |
| The second and third week | Methods of fastening using screws, types of screws, types of nuts, with drawing |
| Week four and five | Connecting by means of threads, their types, uses, drawing a collage painting |
| Week six and seven | Connecting by welding, welding symbols, drawing an assembly plate with weld symbols |
| eighth and ninth week | Fastening by rivet, shapes of rivet nails, types of fastening by rivet drawing |
| tenth week | Application plate for segmentation and assembly of mechanical crane |

| | |
|---|---|
| <p>- Week eleven</p> | <p>Springs, their types, uses, drawing of a compression spring. Springs, their types, uses, drawing of a compression spring</p> |
| <p>The twelfth week</p> | <p>Drawing of an application plate for segmentation and assembly of an exhaust valve</p> |
| <p>thirteenth week</p> | <p>Column connections (couplings), their types, application drawing.</p> |
| <p>The fourteenth and fifteenth weeks</p> | <p>Couplings and clutches.</p> |
| <p>Sixteenth week</p> | <p>Pulleys and belts, their types and uses, with two drawings to assemble parts containing On belt wheels of various types</p> |
| <p>Week seven and eighteen</p> | <p>Types of gears, gears, basic definitions, drawing of gears with Assembly plate for engaging the gear</p> |
| <p>Week nineteen and twenty</p> | <p>Bevel gears, basic definitions with assembly plate drawing for gearing Bevel gear.</p> |

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|-------------------|--|
| 15- Week 23-22-21 | Introduction to Autodesk Inventor |
| | And the two-dimensional drawing environment. |
| | |
| 16- Week 25-24 | Autodesk Inventor program |
| | And the assembly environment |
| | |
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Course description Form

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|---|--|
| 1. Course Name: Management & Accupational Safety (industrial management a quality control) | |
| 2. Course Code: M&A.S | |
| 3. Semester / Year: Second/annual | |
| 4. Description Preparation Date: 8/2/2024 | |
| 5. Available Attendance Forms: Theoretical lectures | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) : 60 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: A.P. Zuher Hassan Abdullah Email: inb.zuher74@edu.atu.iq | |
| 8. Course Objectives | |
| Course Objectives | Teaching and training the student to recognize the control charts, international specifications, and industrial safety found in laboratories, and to manage those laboratories, diagrams, and safety precautions. Teaching the student to project the combined figure Teaching the student to draw three-part mechanical parts assembled |
| 9. Teaching and Learning Strategies | |
| Strategy | -1 Theoretical lectures - 2- Use the blackboard |
| 10. Course Structure | |

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------|---------|--|---------------------------------------|-------------------------------|--------------------------------|
| 1-15 | 2 hours | Everything related to management. | Management administrative operations. | Blackboard discussion reports | Theoretical and surprise exams |
| 16-30 | 2 hours | Everything related to quality control. | Quality control charts | Blackboard reports | Theoretical and surprise exams |

11.

11.Course Evaluation

The degree is distributed

1- 20 marks for the first semester for practical.

2- 20 marks for the second semester for practical

3 - 10 marks for student activities

4 - 50 marks final exam

12.

13. Learning and Teaching Resources

| | |
|--|---|
| Required textbooks (curricular books, if any) | Industrial Management Book - Acer Soussan |
| Main references (sources) | Electronic scientific websites |
| Recommended books and references (scientific journals, reports...) | -Scientific reports 1-Scientific sources 2- Websites |
| Electronic References, Websites | Periodic visits to laboratories and factories continuous education |

| Theoretical vocabulary | |
|-------------------------------|---|
| Week | Vocabulary details |
| First | <p style="text-align: center;">Management:</p> Management and its development, stages development of management, basic principles of management, characteristics of management, levels of management. |
| Second | <p style="text-align: center;">Management:</p> Administrative functions, industrial management, functions, industrial engineering, characteristics of industrial management |
| Third | <p style="text-align: center;">Layout of industrial facility:</p> <ul style="list-style-type: none"> - Location and layout of industrial facility - Effect main factors to select of industrial project sites - Layout of industrial facility (initial layout of the factory) - Classification layout types of industrial facility - Advantages, limitations and cases of application (product layout, Process Layout, fixed layout, hybrid layout)(|
| Fourth | <p style="text-align: center;">Feasibility study for industrial projects:</p> <ul style="list-style-type: none"> - Idea for feasibility study of industrial projects <li style="padding-left: 40px;">Industrial project - - Stages of feasibility studies - Importance of feasibility studies |
| Fifth | <p style="text-align: center;">Production planning:</p> Production planning, concept of production planning, objectives of production planning and control |
| Sixth | <p style="text-align: center;">Production planning:</p> Types of production, production planning methods, linear programming methods, graphical method, and transportation method |
| Seventh | Discussion reports submit by students with a test |
| Eighth | <p style="text-align: center;">Work study and standard time:</p> Work study, work study methods, method study, time study, work measure |
| Ninth | <p style="text-align: center;">Maintenance:</p> Maintenance, importance of maintenance, concept of the technological system |
| Tenth | <p style="text-align: center;">Maintenance:</p> Types of maintenance, types of malfunctions |
| Eleventh | Training: |

| | |
|------------------|---|
| | Training, concept of training, importance of training, training methods |
| Twelfth | Industrial costs and wages: Costs, classification of costs, wages |
| Thirteenth | Industrial costs and wages: Calculating methods of wages, incentives, types of incentives |
| Fourteenth | Purchase management: Purchases, purchasing steps, inventory, types of stored materials and controlled methods |
| Fifteenth | Industrial safety: Industrial safety, accidents, types of accidents, accident prevention methods, protective equipment and their types |
| Sixteen | Quality control: Meaning of control, meaning of quality |
| Seventeenth | Quality control: Definition of quality, quality specifications, Control factors of quality, development and improvement of quality, quality of design, quality of conformity, international and Iraqi standard specifications. |
| Eighteenth | Quality control methods and sample inspection plans: Quality control methods, test and inspection methods, quality control steps, sampling methods, sample test schedule |
| Nineteenth | Quality control methods and sample inspection plans: Operating characteristic curve, design quality, data collection (type and analysis) |
| Twentieth | Control charts |
| Twentieth-first | Control charts: Prepare and use a mean chart Prepare and use a Pareto chart |
| Twentieth-second | Control charts: Prepare a standard deviation chart Prepare a defect chart |
| Twentieth-third | Control charts: Scatter plot, prepare a scatter plot |
| Twentieth-fourth | Control charts: Quality control charts for standard deviation and percentage of defective units, Histogram (prepare and use) |
| Twentieth-fifth | Types of control charts: Control charts for variables (control chart for arithmetic mean (X-chart) |
| Twentieth-sixth | Types of control charts: Control charts for variables (control chart for range R-Chart and control chart for standard deviation δ -chart) |

| | |
|-------------------|--|
| Twentieth-seventh | Types of control charts: Control charts for Attributes (Control chart for the percentage of defective units P-chart) |
| Twentieth-eighth | Types of control charts: Control charts for attributes (Control chart to number defects in one item, C-Chart) |
| Twentieth-ninth | Types of control charts: Control charts for attributes (Control chart for average number defects in the set of items U-chart) |
| Thirty | Discussion reports submit by students with a test |

Course Description Form

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|---|
| 1. Course Name: Metal Material |
| |
| 2. Course Code: M.M |
| |
| 3. Semester / Year: Second/annual |
| |
| 4. Description Preparation Date : 8/2/2024 |
| |

| 5. Available Attendance Forms: Theoretical + practical lectures | | | | | |
|---|---------|---|---|----------------------------|--------------------------------|
| 6. Number of Credit Hours (Total) / Number of Units (Total) : 120 | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: A.T. Malik Abd Alhusyn Email: malik.alhusayn.iba@atu.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | Teaching and training students to learn about metallurgy, the composition of metal blocks, common defects in castings, learn about plastic and elastic deformation, learn about stress curves, heat balance diagrams, and thermal coefficients, and learn about corrosion and its economic costs. | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | 1- Theoretical lectures + practical lectures 2- Use the blackboard | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1-10 | 4 hours | Representing formation the graphically | The theory of plastic and elastic formation | Blackboard theoretical and | Theoretical and surprise exams |
| 11-15 | 4 hours | Use of metal property test devices. | Mechanical properties metals | Discuss reports | Theoretical and surprise exams |
| 16-20 | 4 hours | Use of ovens. | Thermal transactions | Discuss reports | Practical exams |
| 21-30 | 4 hours | Represent diagrams graphically and calculate critical points | Heat balance diagrams | Draw on board | Practical exams |

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11. Course Evaluation

The degree is distributed

1- 20 marks for the first semester for practical.

2- 20 marks for the second semester for practical

3 - 10 marks for student activities

4 - 50 marks final exam

12. Learning and Teaching Resources

| | |
|--|--------------------------------|
| Required textbooks (curricular books, if any) | Curriculum book |
| Main references (sources) | Electronic scientific websites |
| Recommended books and references (scientific journals, reports...) | Scientific books on minerals |
| Electronic References, Websites | 1-Scientific sources |

Vocabulary details

| | |
|----|---|
| 1 | Definition of metallurgy , Crystallization Dendritic, crystallization is a m effect of cooling rate on the structure |
| 2 | Installing metal blocks, and common casting |
| 3 | defects Factor of atomic packing, Crystal levels and trends crystallography, The phenomenon of allotropic |
| 4 | Point and linear crystal lattice defects |
| 5 | Flexible and plastic forming |
| 6 | strain hardening, hot and cold forming |
| 7 | Recovery, recrystallization and crystal growth |
| 8 | stress curves, types of fractures, Rotation in ductile fracture and brittle fracture |
| 9 | Fatigue, the mechanism by which fatigue occurs, the factors affecting the extent of fatigue, the materials used for fatigue |
| 10 | Creep ,The mechanism of creep-resistant materials |
| 11 | Compound, phase, solid solution, system, equilibrium, alloy formation, mechanical mixture, eutectics |
| 12 | the heat equilibrium curve for a fully melted binary alloy in the liquid and solid states. Heat equilibrium curve for a binary alloy that is completely melted in the liquid state and insoluble in the solid state |

| | |
|----|---|
| 13 | the heat equilibrium curve for a binary alloy that is fully melted in the liquid state and has limited melting in the solid state |
| 14 | the heat equilibrium curve for a binary alloy that is completely melted in the liquid state and forms a chemical compound when frozen. system o |
| 15 | Iron, carbon dissolution in iron, heat equilibrium diagram for iron-carbon system |
| 16 | Complete the heat equilibrium diagram for the iron-carbon |
| 17 | Formation of austenite, The mechanism for converting pearlite into |
| 18 | Austenite transformations with constant temperature and transformations by continuous cooling |
| 19 | Heat treatments, annealing, tempering, quenching |
| 20 | Completing Heat treatments (tempering, quenching) |
| 21 | Surface hardening, carbonization of all types, and their treatments followed by solid melting |
| 22 | 22 Alloy steel: The effect of alloying elements on the properties of steel |
| 23 | 23 Stainless steel , tools steel |
| 24 | Cast iron production and heat treatments |
| 25 | Complementing the production of cast iron and its most important types |
| 26 | Definition of corrosion and the direct and indirect economic cost of corrosion. Manifestations of corrosion and the mechanism |

| | |
|----|--|
| | which corrosion occurs |
| 27 | General corrosion, cavernous corrosion, galvanic corrosion, a passivity Faraday's law |
| 28 | Soil-associated corrosion, facultative corrosion, intercrystall corrosion and stress corrosion |
| 29 | The optimal choice of material for ambient softening design a operation |
| 30 | Ways to prevent corrosion |

Course Description Form

| | |
|--|---|
| 1. Course Name: Computer Applications (2) Excel Program | |
| 2. Course Code: C.A | |
| 3. Semester / Year: Second/annual | |
| 4. Description Preparation Date: 8/2/2024 | |
| 5. Available Attendance Forms: Theoretical + practical lectures | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) : 90 1 theoretical hour + 2 practical hours | |
| 7. Course administrator's name (mention all, if more than one name) Name: A.T. Zainab Abd Al Abbas Email: zainabalnamey68@gmail.com | |
| 8. Course Objectives | |
| Course Objectives | Teaching and training students on methods of entering coordinates using different methods (absolute–relative–polar) and drawing using AutoCAD in two– and three–dimensional space.. |
| 9. Teaching and Learning Strategies | |
| Strategy | -1 - Theoretical lectures + practical lectures - 2- Use the blackboard - 3- Use the smart screen |
| 10. Course Structure: | |

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------|---------|---|---|--|------------------------------|
| 1-15 | 3 hours | Learn the student understand how to drawing prompts | Principles of drawing installation Dimensions on objects surfaces. | Blackboard theoretical and practical lectures. | Surprise theory exam |
| 16-30 | 3 hours | Application of Auto system instructions | System instructions AutoCAD and the dimensional shapes | DATA SHOW Use the sm screen | Daily assignments correction |

11. Core Evaluation

The degree is distributed

1- 20 marks for the first semester for practical.

2- 20 marks for the second semester for practical

3 - 10 marks for student activities

4 - 50 marks final exam

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | Printed material teacher lectures and others |
| Main references (sources) | Help books from scientific websites |
| Recommended books and references (scientific journals, reports...) | 1-Scientific sources 2- Websites |
| Electronic References, Websites | Continuing education courses |

Computer basics curriculum and office applications

The third part

| Curriculum vocabulary | The week |
|---|--|
| Introduction to PowerPoint and Word | the first |
| Run Microsoft Excel 2010 and explain the Microsoft Excel 2010 interface | the second |
| Mouse cursor shapes in Excel | the third |
| Explanation of the file tab | the fourth |
| Explanation of the home page tab | Fifth and sixth |
| Explanation of the page layout tab | Seventh and eighth |
| Explanation of the Insert tab | The ninth and tenth |
| Explanation of the chart tools “design” tab Explanation of the layout tools tab Explanation of the chart tools “format” tab | Eleventh and twelfth |
| Explanation of the formulas tab | The thirteenth, fourteenth and fifteenth |
| Explanation of the set of functions function library | Sixteenth and seventeenth |
| Explanation of the Data Tab | The eighteenth and nineteenth |
| Explanation of the Review Tab | Twenty, twenty-one and twenty-two |
| Explanation of the view tab | Twenty-third and twenty-fourth |
| Solve chapter questions | 25th |
| The most important keyboard shortcuts | Sixth, seventh and twenty-eighth |
| Student activities for Excel | Twenty-nine and thirty |

Course Description Form

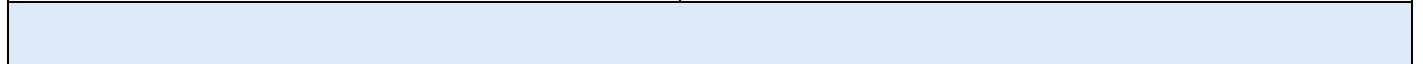
| | |
|--|--|
| 1. Course Name: Work Shops 2 | |
| | |
| 2. Course Code: W.S | |
| | |
| 3. Semester / Year: Second/annual | |
| | |
| 4. Description Preparation Date: 8/2/2024 | |
| | |
| 5. Available Attendance Forms: Practical application workshops | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) : 240 | |
| | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: A.T Abbas fakery Email: abbas.alrubayie@atu.edu.iq | |
| 8. Course Objectives | |
| Course Objectives | Discussing the practical side of the Mechanics Department/Product Branch and introducing the student to the most important mechanical workshops and learning about their many different types and technological methods used in arranging the lines of each workshop according to the sequence of steps in making the works for each workshop. |
| 9. Teaching and Learning Strategies | |
| Strategy | <ul style="list-style-type: none"> - Teaching how to use the machines correctly by having the student stand on the machine himself and operate it. - Learning by holding training courses and ongoing scientific seminars to hone the student's talent in workshops |

| | |
|--|--|
| | <ul style="list-style-type: none"> - Publishing educational posters and information boards for each workshop - Identify and learn how to use the personal protective equipment that the worker uses in the work environment to avoid the occurrence of various types of accidents and make the work environment as safe and clean as possible. |
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10 .Learning and Teaching Resources

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| Required textbooks (curricular books, if any) | Fundamentals and operations book. |
| Main references (sources) | Books on mechanical operations, sources maintenance of machines and equipment. |
| Recommended books and references (scientific journals, reports...) | Theoretical + practical reports |
| Electronic References, Websites | Internet sites and browsers |



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| 11.Course Evaluation | |
| The degree is distributed Continuing education . | |

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| Weekly | vocabulary details |
| first | <p>Milling (5 weeks)</p> <p>Horizontal milling machine, main unit.</p> <p>Explaining the parts of the machine and the function of each one, operating the machines and choosing speeds and feeds, tools and</p> |

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| | <p>devices attached to the machines and their uses and methods of installing them, dividing heads, slots, rotating trays, universal milling heads, rack work heads, sewer work heads.</p> <p>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>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> |
| <p>second</p> | <p>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> <p>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.</p> |
| <p>the third</p> <p>Fourth</p> | <p>Milling bevel gears on general machines:</p> <p>Milling helical gears and inclined racks on general machines: (The same method for milling straight gears)</p> <p>, milling the artifacts by dividing the corners</p> <p>Milling of internal sewers.</p> <p>Milling curves, explaining the general laws of each process, steps to</p> |

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| <p>Fifth</p> | <p>implement it, preparing raw materials, choosing diameters, choosing operating rates, performing milling operations, reviewing the dimensions of the artifacts.</p> <p>Milling machine maintenance:</p> <p>Dismantling and installing the mandrel shaft.</p> <p>Opening, maintaining and installing the machine table</p> <p>Open the speed box for the main parts and learn how to change the speeds and reinstall them.</p> <p>Open the feed speed box and learn how to change it and reinstall it.</p> <p>Performing speed-changing operations using belts and pulleys and learning how to convert them and the process of tightening them.</p> <p>Identify the electrical control circuits for operating the milling machine.</p> |
| <p>first</p> | <p align="center">- Grinding (5 weeks)</p> <p>Grinding machines:</p> <p>(Internal and external cylindrical, eccentric grinding, surface grinding, tool sharpening)</p> <p>Grinding stones:</p> <p>Their shapes, types, specifications, use of each, preparing grinding stones for operation (adjusting balance, leveling stones).</p> <p>Surface grinding machines:</p> <p>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.</p> <p>Training on grinding flat, parallel, perpendicular and inclined surfaces.</p> <p>Drain grinding: Training on grinding different drains and round drains.</p> |

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| Second | <p style="text-align: center;">1-Cylinder grinding:</p> <p>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> |
| third | <p>1-Eccentric grinding and grinding of cranks.</p> <p>2-Variou s grinding operations using previous grinding operations and training on them.</p> |
| forth | <p>Number sharpening machine:</p> <p>Operating tool sharpening machines, how to deal with them, and choosing the appropriate machine for sharpening the specific tool.</p> <p>How to install the cutting tool on the machine and determine the required angles for the cutting edge.</p> <p>Performing sharpening operations on models of a number of pieces (single-edged cutting tool, double-edged cutter, multi-edged cutting tool.</p> |
| fifth | <p>Maintenance of grinding machines (general internal and external cylindrical grinding machines)</p> <ul style="list-style-type: none"> - How to replace the coolant and determine the required level. - Determine the lubrication locations for the machine and the appropriate type of oil and grease. - Performing the process of replacing the belts that transmit rotary speeds for stone and workpieces. |
| first | <p style="text-align: center;">3-Scraping (5 weeks)</p> <p>Flat and vertical planers:</p> <p>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</p> |

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| | <p>installing them, the speeds of cutting and feeding, the inoculation rates, and the selection of each of them.</p> <ul style="list-style-type: none"> - Exercises for scraping straight and inclined surfaces at different angles. - Exercises to make internal and external drains of various shapes. |
| second | Exercises for scraping surfaces and complete items, parts of machines, V-blocks, drill bases. |
| third | Exercises on scraping arcs, making sewers on circular works using dividing devices on planers. |
| forth | Various scraping exercises. |
| fifth | <p>Maintenance of skimmer machine:</p> <ul style="list-style-type: none"> - Maintenance of the skimming machine. - Opening the crocodile and maintenance parts for the control parts along the stroke, as well as changing the location of the stroke. - Parts of various lubrication and lubricating operations and opening the oil pump. |
| first | <p style="text-align: center;">4-Lathing (5 weeks)</p> <p>1- Eccentric turning and turning using a quadrilateral eyelet and methods of installing special workpieces.</p> <p>2-Exercises on various eccentric objects..</p> |

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| second | <p>1- External and internal rotation lathe and formation lathe.</p> <p>2-Exercises for various lathe operations using shaping pens.</p> <p>Turret lathes:</p> |
| third | A general idea about turret lathes and the use of speed and feed tables. |
| forth | <p>Follow up on the operations of various products and prepare the sequence of their operations.</p> <p>1- The pens and tools used, the method of adjusting them, and preparation for making various crafts.</p> <p>2- How to prepare process tracking maps.</p> |
| fifth | <p>Lathe maintenance:</p> <p>1- Conduct disassembly and maintenance of triple and quadruple samples.</p> <p>2- Dismantle the moving crow and perform maintenance.</p> <p>3- Dismantling the small and large plotters and performing their maintenance</p> <p>4-Maintaining the main cutting speed box and calculating the feed speed.</p> |
| First | <p>5-Machines programmed using G-Code</p> <p>1- A historical overview of CNC machines, the differences between regular machines and CNC machines, stages of work on programmed machines.</p> <p>2- Definition of the parts of the machine, the movement axes, the</p> |

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| <p>second</p> | <p>control panel, and the definition and operation of the machine in practice</p> <p>Program, program structure, how to program milling machines, functions used in programmed machines, zero point of the smachine, functions of movement levels.</p> <p>(G17, G18, G19) Motion coordinate functions (G90, G91).</p> <p>Simulation using simulation programs, how to use the program, program instructions.</p> <p>The control panel for the CNC machine according to the ISO9001 system, executing movements via the manual control device, zeroing the machine, zeroing the triangular machine, zeroing the workpiece, and methods for installing the workpiece.</p> |
| <p>third</p> | <p>Linear motion functions (G1, G2), functions for storing segment zero points (reference points)</p> <p>(G51, G52, G53, G54, G55, G56, G57, G58, G59), auxiliary functions F, M, S, T</p> <p>Implement a face milling program using the instructions above and apply it to the calculator using simulation programs and implement it practically on the machine.</p> <p>Rotational motion functions G2, G3, repetition function, mirror image formation function.</p> |
| <p>forth</p> | <p>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>Radius compensation functions (calibration functions) G40, G41, G42, G43, G44</p> <p>Create a program to implement two exercises, one of which is relief</p> |

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| | <p>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> |
| <p>fifth</p> | <p>Fixed functions, single-stage drilling function, two-stage drilling function, tooth operating function, hole expansion function, sifting ring function, longitudinal slit operating function, circular drilling operating function.</p> <p>Implementing a program using the previous functions and applying it on a calculator using simulation programs and executing it on a machine.</p> <p>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> |
| <p>first</p> | <p>6-Vocabularies for the workshop of programmed machines that operate with the CAD-CAM system</p> <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> <p>3-Use the CAD-CAM program to design an engineering product and implement the product on the calculator using a simulation method</p> |
| <p>second</p> | <p>Learn how to replace a damaged kit or define a new kit.</p> <p>Implementing an integrated product on the machine, starting from the design stage on the CAD/CAM program, through the simulation process, and ending with implementing the product on the machine.</p> |
| <p>third</p> | <p>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.</p> |
| <p>forth</p> | <p>Using CAD/CAM software to design an engineering product and implementing the product on a calculator using a simulation</p> |

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| | method. |
| fifth | <p>Learn how to replace a damaged number or define a new number.</p> <p>Implementing an integrated product on the machine, starting from the design stage using the CAD/CAM program, through the simulation process, and ending with implementing the product on the machine.</p> <p>Carrying out many exercises on lathe and milling machines.</p> |

Course Description Form

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| 1. Course Name: Machine Parts Technology |
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| 2. Course Code: M.P.T |
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| 3. Semester / Year: Second/annual |
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| 4. Description Preparation Date: 8/2/2024 |
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| 5. Available Attendance Forms: Theoretical lectures only | | | | | |
|---|--------------------|--|-----------------------|--------------------|--|
| 6. Number of Credit Hours (Total) / Number of Units (Total) : 90 | | | | | |
| 7. Course administrator's name (mention all, if more than one name) | | | | | |
| Name: P. Abbas Ali Mahmoud Email: abbas.mahmood@atu.edu.iq | | | | | |
| 8. Course Objectives | | | | | |
| Course Objectives | | Teaching second-year students on the mechanical design of machine parts based on the stresses affecting the part, mainly On the stress-strain curve, from which all information related to coefficient of vision and strain is extracted, and the design is according to the curve on the side that relates to the flexibility stage, such as reaching the plasticity stage, which relates to the subject of formation. | | | |
| 9. Teaching and Learning Strategies | | | | | |
| Strategy | | - Theoretical lectures + use of the blackboard + Internet review + data show + reports - Identify and learn how to use the personal protective equipment that the worker uses in the work environment to avoid the occurrence of various types of accidents and make the work environment clean . | | | |
| 10. Course Structure | | | | | |
| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
| 1-2 | 3 hours | Strength of Materials. | Stress analysis | the blackboard | duty. |
| 3-8 | 3 hours | Types of ties and rivets. | How to connect parts. | Blackboard SHOW | Discussion assignments. |
| 9-12 | 3 hours | Belts and belts. | Transmission. | DATA SHOW | discussion. |
| 13-15 | 3 hours 3 hours | Types of main and auxiliary columns. | Machine columns. | DATA SHOW | Surprise exams And discuss within the lecture |

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| 16-19 | | Types of joints. | Clutches spacers. | the blackboard | Surprise exams. |
| 20-25 | 3 hours | | | | Surprise exams |
| 26-27 | 3 hours | Types of gears and gears. | Gear design. | Blackboard SHOW | And discuss within the lectur |
| | | Belts and belts. | Movement control. | DATA SHOW | Discussion assignments. |
| 28-30 | | Types of forces. | Suppress simplify forces | the blackboard | Weekly assignment. |

11.Course Evaluation

The degree is distributed :

- 1- 20 marks for the first semester for practical.
- 2- 20 marks for the second semester for practical
- 3 - 10 marks for student activities
- 4 - 50 marks final exam

12.Learning and Teaching Resources

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| Required textbooks (curricular books, if any) | Subject teacher lectures |
| Main references (sources) | Websites |
| Recommended books and references (scientific journals, reports...) | Weekly scientific reports |
| Electronic References, Websites | Various websites and internet browsers |

| Theoretical Subjects | |
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| Week No. | Subject Topics |
| 1 | Review of Strength of Materials |
| 2-3 | Riveted Joints. Types of Riveted Joints ,Design of Riveted Joints, Efficiency of Riveted Joints . |
| 4-5 | Welded Joints Types of welding Joints ,Design of welding Joints |
| 6-7 | Screwed Joints, Design of Bolts for Fastening , Design of Bolts for Power Transition . |
| 8-9 | Keyed Joints , Types of Key , Design of Sunk Key . |
| 10-11 | Frictional Clutches, Type of Frictional Clutches , Design of Frictional Clutches. |
| 12-13 | Types of Springs , Design of Springs |
| Week No. | Subject Topics |
| 14-15 | Types of Belts , Design of Belts. |
| 16-17 | Design of Shafts |
| 18-19 | Design of Journal Bearings |
| 20 | Selection of Ball Bearings |
| 21-22 | Design of Gears by Lewis Equation |
| 23-24 | Gears Trains |
| 25-26 | Design of Simple Gears Box |
| 27-28 | Worm Gears |
| 29-30 | Cams |

Course Description Form

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| 1. Course Name: Manufacturing processes 2 | |
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| 2. Course Code: M.P | |
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| 3. Semester / Year: Second/annual | |
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| 4. Description Preparation Date: 8/2/2024 | |
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| 5. Available Attendance Forms: Theoretical + practical lectures | |
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| 6. Number of Credit Hours (Total) / Number of Units (Total) : 120 | |
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| 7. Course administrator's name (mention all, if more than one name) | |
| Name: L. Faez jawad kadam Email: Faezjawad64@gmail.com | |
| 8. Course Objectives | |
| Course Objectives | Teaching second stage students on cognitive and practical skills different metal manufacturing methods (traditional and non-traditional) And the modern ones that include electronic computers in their work, well as preparing operating cards for mechanical products and calculation forces, time, and other factors related to manufacturing. |

9. Teaching and Learning Strategies

Strategy

- Theoretical lectures + practical + blackboard + data show

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|-------|---------|--|--|--|---|
| 1-8 | 4 hours | Types of interference permissions For mechanical parts. | Interferences allowances Mechanical. | the blackboard | Practical exam In workshops. |
| 9-15 | 4 hours | Methods for measuring roughness. | Roughness measurement. | Whiteboard + | Practical exam In workshops. |
| 16-20 | 4 hours | And examination methods. | Product inspection results | DATA SHOW | Practical exam In workshops. |
| 21-25 | 4 hours | Quantitative products. | Types products. | DATA SHOW | Practical exam In workshops. |
| 26-30 | 4 hours | Operation and configuration methods Various mechanical parts. | Types operating methods And measurements. | the blackboard Whiteboard + DATA SHOW | Practical exam In workshops. Surprise exam Discussion within lecture.. |

11. Course Evaluation

The degree is distributed

1- 20 marks for the first semester for practical.

2- 20 marks for the second semester for practical

3 - 10 marks for student activities

4 - 50 marks final exam

12. Learning and Teaching Resources

| | |
|--|--|
| Required textbooks (curricular books, if any) | Subject teacher lectures |
| Main references (sources) | Websites |
| Recommended books and references (scientific journals, reports...) | Weekly scientific reports |
| Electronic References, Websites | Various websites and internet browsers |

Theoretical vocabulary

| Weekly | vocabulary details |
|--------|---|
| 1 | Geometric tolerances, duals, dual systems, orders of tolerances, dual unit basic deviations, |
| 2 | Types of tolerances, hole basic system, column basic system, symbols duals, tolerances for loose dimensions, detailed duals, selection of duals and their economic advantages. |
| 3 | Geometric tolerances in shape and position and types of shape and position tolerances. |
| 4 | Measurement specifiers, design of measurement specifiers, types of measurement specifiers (internal measuring specifiers, external measuring specifiers, adjustable measuring specifiers, solid measuring specifiers and special measuring specifiers). |
| 5 | Classification of metal fabrication, metal working, introduction to the theory of chip formation and influencing factors, methods of fixing artifacts, including round and non-round objects, and incisive borders. |
| 6 | Identifying the tools used and how to install them for crafts, shaping lathe tools. |

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| 7 | Identifying the types of turning pen angles, the effect of turning pen angles the cutting process, types of turning pen metals, cutting conditions, cutting elements, uses of cutting speeds, and the use of tables and speed maps, classification of cutting tools with respect to operating methods and number of cutting edges. |
| 8 | The cutting edge, the emerging cutting edge and the theory of its formation, the factors that affect it, the factors that lead to reducing its size, cooling and its importance for cutting operations, various cooling liquids |
| 9 | How to conduct an operating card for a group of operations, calculate components, and calculate the cutting time for each operation. |
| 10 | How to take advantage of the sequence card to make a product path through the different units. Factors that affect the choice of cutting speed (1- The effect of the properties of the cutting tool. 2- The effect of the operating elements. 3- The effect of the properties of the metal being worked |
| 11 | Automatic turret turning machines, studying the processes that can be operated and analyzing the processes on the product, how to prepare operating cards. |
| 12 | Types of tools used and their arrangement on the front and rear hexagonal and quadrilateral heads. |
| 13 | Studying how to program automatic programmed lathes and the factors influencing the operating steps. |
| 14 | Milling, learning about the operations that can be performed on milling machines, parts and components of horizontal and vertical milling machines and the nature of the work of each part. |
| 15 | Machine accessories, dividing heads, tools for attaching workpieces to mandrels, and bushings. |

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| 16 | Types of milling knives (disc and finger), gear sharpening knives, and milling knives. |
| 17 | Explaining the steps for performing milling operations, choosing the appropriate machine, the initial dimensions of the artifacts, and methods of attaching the artifacts. |
| 18 | Milling different types of gears (steel, conical, helical, and worm gears). |
| 19 | How to make a ghanfari clutch, a V-block clutch. |
| 20 | Operating rates, cutting and feeding speeds, and the basis for their selection for the following various milling operations. |
| 21 | Skimming: Introduction to the types of planers (trolley, hopper, vertical), the operations that take place on the planing machine, the operating capabilities available with each machine, and methods of attaching the work. |
| 22 | Operating rates, including cutting and feeding speeds, planer attachments such as dividing heads or special devices, angles of planer pens, and types of forces affecting them |
| 23 | The planer planer, clarification of (the cutting stroke, the return stroke) methods of connection to the planer machine and operating rates, calculating the cutting time for planing, preparing the planer sequence card. |
| 24 | Grinding: An introduction to the theory of cutting and the shape of the blade in the grinding process, the grinding stones used (circumferential, face, side, cup, external, internal), their specifications and uses, attachment methods and balances. |

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| 25 | Different grinding machines and the operating capabilities of each type (external and internal cylindrical grinding machines, tool sharpening machines). |
| 26 | Preparing a comprehensive operating card for all cutting operations. |
| 27 | Metal forming: theory of forming, foundations of cold and hot forming, types of forming. |
| 28 | Rolling mill: The basics of rolling and its methods, rolled products, sequence of operations in rolling, machines used, conditions for completing the rolling process. Extrusion: Foundations of metal extrusion and used metals, direct extrusion, reverse extrusion, types of extrusion products. |
| 29 | Cutting and perforation: The foundations of shearing operations, types of molds and their parts, each case, dimensions of the raw material and methods of selecting and calculating shear force. (Drag and deep drag): The foundations of pulling and deep pulling operations, calculating the pulling forces and special ratios in each case, types of pulling and their uses. |
| 30 | Study of unconventional methods in metal forming: A- Hydrostatic extrusion B-Using electrical discharge |

