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

# Academic Program Description Form

University Name: Northern Technical University
Faculty/Institute: Mosul – Technical Institute
Scientific Department: Mechanical Techniques
Academic or Professional Program Name: Mechanical Techniques
Final Certificate Name: Mechanical Technician Diploma
Academic System: Mechanical Techniques
Description Preparation Date: 01-06-2025
File Completion Date: 01-06-2025

Signature:
Head of Department Name:
Dr. Yasir Hassan Ali

Date: 23/6/2025

Signature: A.h
Vice dean of scientific affairs

Date: 09/07/2025

The file is checked by: Mohammed Khalid Yousif
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date: 1/7/2025
Signature:

A.N

Authentication of the Dean
Abdul Naser A. Ahmed

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

# Academic Program and Course Description Guide

**2024**

## 1. Program Vision

Mosul Technical Institute seeks to prepare graduates in the field of various technological sciences to work in government departments and benefit from their specialization in the practical and applied field.

## 2. Program Mission

Working to prepare and graduate pioneering scientific and leadership competencies in the field of technological sciences and to develop the knowledge base in the field of scientific research to serve the local, regional, and international communities. In addition, training and refining students' minds scientifically and cognitively, emphasizing social and cultural values, and responding to the requirements of the labor market.

## 3. Program Objectives

The program aims to prepare specialized technical staff who are scientifically and practically qualified and at a technical level that is consistent with the requirements of technological development. In addition, to advance the department's specialization in a manner that suits and meets the needs of the labor market.

## 4. Program Accreditation

**There is no program accreditation until now**

## 5. Other external influences

1-Scientific Updates – Scientific Visits
2. Discussion sessions on global discoveries related to the field of mechanics
3. Summer training for first-year students
4. Linking the program with the labor market or the community
5. Financial, logistical, or training support
6. Facilitating employment and practical training
7. Continuous guidance for the program

## 6. Program Structure

| Program Structure | Number of Courses | Credit hours | Percentage | Reviews* |
|---|---|---|---|---|
| Institution Requirements | 10 | 18 | 55% | 4 basic<br>6 optional |
| Institute Requirements | 7 | 16 | 44% | 5 basic<br>2 optional |
| Department Requirements | 27 | 96 | 28% | 21 basic<br>6 optional |
| Summer Training | Yes | | | |
| Other | Null | | | |

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

## 1. Program Description

| Credit Hours | | Course Name | Course or Course Code | Year/Level |
|---|---|---|---|---|
| practical | theoretical | | | |
| | 2 | Democracy and Human Rights | NTU 100 | 2024-2025 / first |
| | 2 | English Language 1 | NTU 101 | |
| 1 | 1 | Computer 1 | NTU 102 | |
| | 2 | Arabic Language 1 | NTU 103 | |
| | 2 | Sports (optional) | NTU 104 | |
| | 2 | mathematics | MTI100 | |
| | 3 | Mechanical Industries | MTI101 | |
| | 3 | Engineering Drawing | MTI102 | |
| | 2 | Calculus | MTI103 | |
| 3 | 2 | Engineering Mechanics/Static | MET120 | |
| 3 | 2 | Engineering Mechanics/ Dynamics | MET121 | |
| 3 | 2 | Measurements and Casting | MET122 | |
| 3 | 2 | Welding | MET123 | |
| 2 | 2 | Engineering Materials | MET124 | |
| 4 | --- | Mechanical drawing | MET125 | |
| 2 | 2 | Thermodynamics | MET126 | |
| 6 | --- | Advanced Mechanical Industries | MET127 | |
| 2 | 2 | Electrical Technology | MET128 | |
| | 2 | Strength of Materials | MET129 | |
| | 2 | Renewable Energy | MET130 | |
| | --- | Summer Training | MET131 | |
| | 2 | English Language 2 | NTU200 | 2024-2025 /second |
| | | Computer | NTU202 | |
| | 1 | Crimes of the Baath regime in Iraq | NTU 203 | |

| | | | | |
|---|---|---|---|---|
| | 1 | Professional Ethics | NTU 204 | |
| | 2 | Project 1 | TIMO206 | |
| | 2 | Principles of occupational safety | TIMO207 | |
| | 2 | Industrial Management | TIMO208 | |
| | 2 | Machine Parts Technology 1 | METP210 | |
| | 2 | Machine Parts Technology 2 | METP211 | |
| 2 | 2 | Manufacturing processes 3 | METP212 | |
| 2 | 2 | Manufacturing processes 4 | METP213 | |
| 6 | --- | Workshops 3 | METP214 | |
| 6 | --- | Workshops 4 | METP215 | |
| 2 | 2 | Metals1 | METP216 | |
| 2 | 2 | Metal 2 | METP217 | |
| 3 | | Industrial Drawing 1 | METP218 | |
| 3 | | Industrial Drawing 2 | METP219 | |
| 2 | 1 | Computer Applications 1 | METP220 | |
| 2 | 1 | Computer Applications 2 | METP221 | |
| 2 | | Project 2 | METP222 | |
| | 2 | Strength of Material 2 | METP223 | |
| 2 | 2 | Welding and metal forming | METP224 | |
| | 2 | Quality control | METP225 | |

## 7. Expected learning outcomes of the program

**Knowledge**

**A1.** Understanding how to gather information for the purposes of public interest
**A2.** Learning about laboratory equipment and instruments, including how to operate and work with them
**A3.** Understanding how to handle these devices, especially metal testing equipment
**A4.** Following industrial safety procedures in laboratories

**Skills**

**B1.** Training the student on all laboratory environments and understanding associated risks
**B2.** Training the student on how to connect equipment and conduct experiments
**B3.** Training the student on how to maintain and properly handle laboratory equipment
**B4.** Aiming to develop the skill of designing and establishing laboratories

**Ethics**

**C1.** Education and training on group participation and volunteer work

**C2.** Developing solutions for problems occurring in institutions and how to address them
**C3.** Preparing qualified educational personnel who can be relied upon in governmental institutions within the specialization
**C4.** Preparing the requirements of the labor market and enhancing economic capacity

## 8. Teaching and Learning Strategies

1- Explain the scientific courses to students in detail.
2- Involve students in solving mathematical and technical problems.
3- Discuss and discuss vocabulary related to the topic.

## 9. Evaluation methods

1. Quizzes tests, midterm and final exams (theoretical and practical).
2. Submission of weekly reports, seminars, as well as daily attendance, participation, and class activities.
3. Discussion of graduation projects and research.

## 11-Faculty

### Faculty members

| Academic rank | specialization | | Special requirements/skills (if applicable) | | preparation of the teaching staff | |
|---|---|---|---|---|---|---|
| | General | Specialized | | | Lecturer | Permanent staff |
| Ass.prof. | Mechanical | Application | | | | Permanent staff |
| Teacher | Mechanical | Production & Metals | | | | Permanent staff |
| Teacher | Mechanical | Production & Metals | | | | Permanent staff |
| Teacher | Mechanical | Production & Metals | | | | Permanent staff |
| Assistant Lecturer | Mechanical | Production & Metals | | | | Permanent staff |
| Assistant Lecturer | Mechanical | Thermal forces | | | | Permanent staff |
| Assistant Lecturer | Mechanical | Thermal forces | | | | Permanent staff |
| Assistant Lecturer | Mechanical | Fluids and Thermals | | | | Permanent staff |
| Assistant Lecturer | Mechanical | Production & Metals | | | | Permanent staff |
| Assistant Lecturer | Mathematics | Statistics | | | | Permanent staff |

| | | | | | | |
|---|---|---|---|---|---|---|
| Assistant Lecturer | English | Translation | | | | Permanent staff |
| Assistant Lecturer | Arabic language | Arabic language | | | | Permanent staff |
| Assistant Lecturer | Electrical | Electrical | | | **Lecturer** | |
| Assistant Lecturer | **Political Science** | **Political Science** | | | **Lecturer** | |

## Professional Development

**Mentoring new faculty members**

1- Participating in scientific conferences related to the field of mechanics
2- Sending staff for training inside and outside the country
3- Conducting field research related to the field of mechanics
4- Scientific collaboration with other universities and similar colleges
5- Scientific seminars and symposia

**Professional development of faculty members**

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

## 10. Acceptance Criterion

**1- Total credits**
**2- Branch (Scientific, Vocational)**
**3- Student interview**
**4- Determining the male-to-female ratio**
**5- Determining the number of students according to the department's admission plan**

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

1- Textbooks
2- Supporting resources
3- The Internet, self-study websites, and Iraqi university websites.

## 12. Program Development Plan

1- Keeping pace with scientific developments in the field of specialization and providing students with all the latest developments.
2- Developing the curriculum.
3- Displaying scientific videos.
4- Organizing study sessions.

| Program Skills Outline | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Learning outcomes required from the program | | | | | | | | | | | | | | | |
| Values | | | | Skills | | | | Knowledge | | | | Basic or optional | Course Name | Course Code | Year/Level |
| C4 | C3 | C2 | C1 | B4 | B3 | B2 | B1 | A4 | A3 | A2 | A1 | | | | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Democracy and Human Rights | NTU 100 | 2023-2024/First |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | English Language 1 | NTU 101 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Computer 1 | NTU 102 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Arabic Language 1 | NTU 103 | |
| / | / | / | / | / | / | / | / | / | / | / | / | optional | Sports (optional) | NTU 104 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | mathematics | MTI100 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Mechanical Laboratories | MTI101 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Engineering Drawing | MTI102 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Calculus | MTI103 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Engineering Mechanics/Static | MET120 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Engineering/Kinetic Mechanics** | **MET121** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Measurements and plumbing** | **MET122** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **weld** | **MET123** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Engineering Materials** | **MET124** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Mechanical drawing** | **MET125** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Thermodynamics** | **MET126** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Advanced mechanical laboratories** | **MET127** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Electrical Technology** | **MET128** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Optional** | **Material bargaining** | **MET129** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Optional** | **Renewable Energy** | **MET130** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Summer Training** | **MET131** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **English Language 2** | **NTU200** | 2023- |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Computer** | **NTU202** | 2024/II |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Crimes of the Baath regime in Iraq** | **NTU 203** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Professional Ethics** | **NTU 204** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Project 1** | **TIMO206** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Optional** | **Principles of occupational safety** | **TIMO207** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **optional** | **Industrial Management** | **TIMO208** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Machine Parts Technology 1** | **METP210** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Machine Parts Technology 2** | **METP211** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Manufacturing processes 3** | **METP212** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Manufacturing processes 4** | **METP213** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Coefficient 3** | **METP214** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Coefficient 4** | **METP215** | |
| / | / | / | / | / | / | / | / | / | / | / | / | **Compulsory** | **Metals1** | **METP216** | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Metal 2 | METP217 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Industrial Drawing 1 | METP218 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Industrial Drawing 2 | METP219 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Computer Applications 1 | METP220 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Computer Applications 2 | METP221 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Compulsory | Project 2 | METP222 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Optional | Material Resistance 2 | METP223 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Optional | Welding and metal forming | METP224 | |
| / | / | / | / | / | / | / | / | / | / | / | / | Optional | Quality control | METP225 | |

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

# Course Description Form

| |
|---|
| 1. Course Name: |
| Mechanical Techniques |
| 2. Course Code: |
| **METP216** |
| 3. Semester / Year: |
| 1st. and 2nd. Semester/ 2024-2025 |
| 4. Description Preparation Date: |
| 01-06-2025 |
| 5. Available Attendance Forms: |
| 1- The weekly lesson schedule (theoretical and practical) is mandatory.<br>2- Discussions, academic sessions, other extracurricular activities, a academic conferences. |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 60 hours/ 60 units |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: dr.Luqman Khaleel Hayder<br>Email: dr.luqman@ntu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | • .....<br>• .....<br>• ..... |

| 9. Teaching and Learning Strategies |
|---|
| Learning and Teaching Strategy<br>1. Providing students with the basics and topics related to the learning outcomes prior to the skills needed to solve practical problems through lectures or presentations.<br>2. Solving a set of practical and applied examples by the course instructor.<br>3. Asking students to research some of the course vocabulary and how to utilize it in engineering fields.<br>4. Asking students to work in a group to prepare reports and research in areas related to the course.<br>5. Using modern means to present scientific and theoretical aspects, such as projectors, to attract attention and engage students, thus better conveying ideas.<br>6. Questioning students through discussion groups by posing thought-provoking questions (how, why, when, where, and which) on specific topics.<br>7. Using modern teaching methods, such as animation films and videos of practical experiments. |

| 10. Expected Program Learning Outcomes |
| --- |
| Knowledge:<br>A1 - Identify the behavior of metals under the influence of external forces and their mechanical properties.<br>A2 - Identify the most important tool for determining the mechanical properties of metals, namely the stress-strain curve.<br>A3 - Identify the equipment and laboratories, how to operate them, and how to work with them.<br>A4 - How to handle these devices, especially metal testing devices, and how to read and analyze the results. |
| Skills: |
| B1 - Train the student on all laboratory equipment, how to connect them, and how to conduct experiments.<br>B2 - Train the student on how to read and analyze curves and establish the relationship between variables.<br>B3 - Train the student on how to prepare standard samples for each device.<br>B4 - Train the student on how to identify and analyze defects in metals and understand their causes.<br>Values: |
| Values: |
| C1 - The student will be able to distinguish between types of metals and determine their mechanical properties.<br>C2 - The student will be able to operate laboratory equipment and determine standard samples for each device.<br>C3 - The student will be able to identify defects in metals through engineering tests.<br>A4 - The student will be able to determine the microscopic structure of metals through alloying system diagrams. |

| 11. Course Structure | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **Required Learning Outcomes** | **Unit or subject name** | **Learning method** | **Evaluation method** |
| First | 4 | Understanding the topic | Introduction to metallurgy, dendritic crystallization, the effect of cooling rate on microstructure | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Second and third | 4 | Understanding the topic | Composition of mineral aggregates, (cast solidification), common defects in castings, atomic packing factor, crystal orientations, and the phenomenon of priming | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Fourth and fifth | 4 | Understanding the topic | Lattice defects, point defects, linear defects, ductile and plastic forming, slip, twinning | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Sixth and seventh | 4 | Understanding the topic | Strain hardening, cold forming, hot forming, recovery, recrystallization, crystal growth | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Eighth and ninth | 4 | Understanding the topic | Stress-strain curves, bending, extension, fracture, fracture types, transition from ductile to brittle fracture Fatigue, fatigue mechanism, factors affecting fatigue limit, fatigue-resistant materials | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Tenth and eleventh | 4 | Understanding the topic | Creep, creep mechanism, creep-resistant materials, composite, phase, solid solution, system, equilibrium, alloy formation, mechanical mixture | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |

| | | | | | |
|---|---|---|---|---|---|
| Twelfth and thirteenth | 4 | Understanding the topic | Thermal equilibrium diagram of solid solution, Thermal equilibrium of a eutectic compound, thermal equilibrium diagram | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Fourteenth and fifteen | 4 | Understanding the topic | Thermal equilibrium diagram of a chemical compound upon freezing | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |

| 9. Course Evaluation | |
|---|---|
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc | |
| 10.Learning and Teaching Resources | |
| Required textbooks (curricular books, if any) | |
| Main references (sources) | **Crystallography of Pure Metals**<br>A. R. Bailey M.Sc., Ph.D., D.I.C., A.I.M.<br>**Binary Alloying**<br>A. R. Bailey M.Sc., Ph.D., D.I.C., A.I.M.<br>**Effects of Stress on Metals**<br>A. R. Bailey M.Sc., Ph.D., D.I.C., A.I.M. |
| Recommended books and references (scientific journals, reports...) | **A Text-Book Of Metallurgy**<br>by A R Bailey (Author |
| Electronic References, Websites | |

## Course Description Form

| 11.Course Name: |
|---|
| Mechanical Techniques |
| 12.Course Code: |
| **METP217** |
| 13.Semester / Year: |
| 1st. and 2nd. Semester/ 2024-2025 |
| 14.Description Preparation Date: |
| 01-06-2025 |
| 15.Available Attendance Forms: |
| 1- The weekly lesson schedule (theoretical and practical) is mandatory.<br>2- Discussions, academic sessions, other extracurricular activities, a academic conferences. |
| 16.Number of Credit Hours (Total) / Number of Units (Total) |
| 60 hours/ 60 units |
| 17. Course administrator's name (mention all, if more than one name) |
| Name: dr.Luqman Khaleel Hayder<br>Email: dr.luqman@ntu.edu.iq |

| 18.Course Objectives | |
|---|---|
| **Course Objectives** | • ..... <br> • ..... <br> • ..... |

| 9. Teaching and Learning Strategies |
|---|
| Learning and Teaching Strategy<br>1. Providing students with the basics and topics related to the learning outcomes prior to the skills needed to solve practical problems through lectures or presentations.<br>2. Solving a set of practical and applied examples by the course instructor.<br>3. Asking students to research some of the course vocabulary and how to utilize it in engineering fields.<br>4. Asking students to work in a group to prepare reports and research in areas related to the course.<br>5. Using modern means to present scientific and theoretical aspects, such as projectors, to attract attention and engage students, thus better conveying ideas.<br>6. Questioning students through discussion groups by posing thought-provoking questions (how, why, when, where, and which) on specific topics.<br>7. Using modern teaching methods, such as animation films and videos of practical experiments. |
| 10. Expected Program Learning Outcomes |
| Knowledge:<br>A1 - Identify binary alloy systems.<br>A2 - Identify the microstructure and its relationship to the mechanical properties of metals and alloys.<br>A3 - Identify the iron-carbon diagram and learn about the types of carbon steel and cast iron and their applications.<br>A4 - Identify the heat treatment methods for carbon steel and cast iron.<br>A5 - Identify the principles of corrosion in metals, its types, and methods of preventing it. |
| Skills:<br>B1 - Train the student on how to create heat balance diagrams for binary alloy systems.<br>B2 - Train the student on how to read heat balance diagrams and extract their microstructure.<br>B3 - Train the student on how to link microstructure to mechanical properties through diagrams.<br>B4 - Train the student on how to perform heat treatments on various metal alloys.<br>B5 - Train the student on how to prevent corrosion that occurs in metals. |

Values:
C1 - The student will be able to draw and create heat balance diagrams for binary alloy systems.
A2: The student will be able to determine the mechanical properties of alloys by identifying their microstructure.
A3: The student will be able to understand the applications of carbon steel and cast iron alloys in mechanical structures.
A4: The student will be able to change their mechanical properties through heat treatment.
A5: The student will be able to identify the causes of corrosion in metals, its types, and methods of protection against it.

11. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| First | 4 | Understanding the topic | Review of the types of heat balance diagrams for binary alloy systems | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Second and third | 4 | Understanding the topic | Eutectic, peritectic, eutectoid transformations and microstructure in carbon steel | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Fourth and fifth | 4 | Understanding the topic | Thermal equilibrium diagram for iron-carbon steel | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Sixth and seventh | 4 | Understanding the topic | Iron steel, its types, microstructure, chemical composition, applications, and mechanical properties | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |

| | | | | | |
|---|---|---|---|---|---|
| Eighth and ninth | 4 | Understanding the topic | Heat treatments for carbon steel, microstructural changes, stainless steel, its types, and applications | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Tenth and eleventh | 4 | Understanding the topic | Cast iron, its types, microstructure, and applications | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Twelfth and thirteenth | 4 | Understanding the topic | Heat treatments for cast iron | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| Fourteenth and fifteen | 4 | Understanding the topic | Corrosion, its types, and protection methods | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |

| 19.Course Evaluation | |
|---|---|
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc | |
| 20.Learning and Teaching Resources | |
| Required textbooks (curricular books, if any) | |
| Main references (sources) | |
| Recommended books and references (scientific journals, reports...) | |
| Electronic References, Websites | |

# Course Description Form

| 1. Course Name: **Thermodynamics** | |
|---|---|
| | |
| 2. Course Code: MET126 | |
| | |
| 3. Semester / Year: **2024-2025** | |
| | |
| 4. Description Preparation Date:12-6-2025 | |
| | |
| 5. Available Attendance Forms: Attendance (2 hours theoretical + 2 hours of work - an average of 4 hours per week) | |
| | |
| 6. Number of Credit Hours (Total) / Number of Units (Total) | |
| 60 hours /4 | |
| 7. Course administrator's name (mention all, if more than one name) | |
| Name: Eng. Zainab Qusay Shareef<br>Email: mti.lec150.zainab@ntu.edu.iq | |
| 8. Course Objectives | |
| **Course Objectives** | **After completing the lecture, the student will be able to:**<br>• **Understand the zeroth law.**<br>• **Distinguish between types of thermometers.**<br>• **Analyze the elements of matter and their expansion.**<br>• **Understand the types of energy, heat, and work.**<br>• **Use the first law of thermodynamics to solve problems related to them.** |
| 9. Teaching and Learning Strategies | |
| **Strategy** | **Knowledge**<br>1- The student able to define thermodynamics.<br>2- The student able to analyze thermodynamic processes and apply the principles of thermodynamics to a variety of thermodynamic processes. |

**Skills**

1- Scientific skills : The ability to distinguish between types energy , heat, and work..
2- Intellectual skills : The ability to apply the principles of Thermodynamics to a variety of thermodynamic processes.
3-communication skills : The ability to write a good report .

**Values**

1- The student will gain an understanding of the zeroth law, types of thermometers, and the expansion of materials.
2- The student will be familiar with the relationship between energy , heat ,work ,and elementary laws of thermodynamics and will be able to solve problems related to them.
3- The student will gain a thorough knowledge of different thermodynamic system (such as closed ,open , and isolated systems) and how to analyze their heat .

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| The first | 2 hours | Student comprehension of the subject | **Chapter one** **1.1**Temperature and the zeroth Law of Thermodynamics **1.2**Thermometers and the Celsius Temperature Scale **1.3**The Constant-Volume Thermometer and the Absc Temperature Scale | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Second | 2 hours | Student comprehension of the subject | **1.4**Thermal Expansion of Solids and Liquids **1.5** Macroscopic Description an Ideal Gas | Theoretical lecture and the use of the screen the means explanation | Daily exam |
| Third | 2 hours | Student comprehension of the subject | **Chapter Two:** **2.1**Heat and the First Law of Thermodynamics **2.2**Heat and Internal Energy **2.3**Heat Capacity and Specific Heat **2.4**Latent Heat | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Fourth | 2 hours | Student comprehension of the subject | **2.5** Energy Transfer Mechanisms: **2.6** Work and Heat in | Theoretical lecture and the use of the screen | Daily exam |

| | | | | | |
|---|---|---|---|---|---|
| | | | Thermodynamic Processes | the means explanation | |
| Fifth | 2 hours | Student comprehension of the subject | Examples | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Sixth | 2 hours | | First Exam | | Monthly Exam |
| Seventh | 2 hours | Student comprehension of the subject | Study of steam. Steam proper using steam tables . | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Eighth | 2 hours | Student comprehension of the subject | Calculations of the properties liquid-vapour mixture( steam), examples of using st tables | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Ninth | 2 hours | Student comprehension of the subject | Ideal Gas : Specific heat constant volume, specific hea constant pressure, equation ideal gas state, gas const universal gas constant | Theoretical lecture and the use of the screen the means explanation | Daily exam |
| Tenth | 2 hours | Student comprehension of the subject | Energy Balance | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Eleventh | 2 hours | | second exam | | Monthly Exam |
| Twelfth | 2 hours | Student comprehension of the subject | The Compressors | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Thirteenth | 2 hours | Student comprehension of the subject | The Turbines | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Fourteenth | 2 hours | Student comprehension of the subject | Heaters/ Coolers | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion, solving problem |
| Fifteenth | 2 hours | Student comprehension of the subject | Pumps | Theoretical lecture and the use of the screen the means explanation | Daily exam |

## 11.Course Evaluation

Evaluation is based on :

١-Semester exam (theoretical + practical) .

| |
|---|
| ٢- Year work , including daily tests, assignments, attendance, and reports .<br>3- Final exam (theoretical +partical) |

| 12.Learning and Teaching Resources | |
|---|---|
| Required textbooks (curricular books, if any) | |
| Main references (sources) | 1-An Introduction to Statistical Mechanics and Thermodynamics Robert H. Swendsen, First edition 2012**.** |
| Recommended books and references (scientific journals, reports...) | All sober scientific journals related to thermodynamics. |
| Electronic References, Websites | Websites for thermodynamics |

# Course Description Form

| |
|---|
| 1. Course Name: **manufacturing processes3** |
| |
| 2. Course Code: METP212 |
| |
| 3. Semester / Year: **2024-2025** |
| |
| 4. Description Preparation Date:10-6-2025 |
| |
| 5. Available Attendance Forms: Attendance (2 hours theoretical + 2 hours of work - an average of 4 hours per week) |
| |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 60 hours /4 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Eng. Zainab Qusay Shareef<br>Email: mti.lec150.zainab@ntu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | he student shall be able to:<br>1- The turning machine is used in workshop.<br>2- Identify the type of operation perform on the lathe and how to implement it.<br>**3-** Identify the variables of the pa necessary for operation.<br>**4-** The operating time of the various turn processes is calculated. |

## 9. Teaching and Learning Strategies

**Strategy**

**Knowledge**

1- The student must be able to identify the parts of a lath machine.

2- The student must be able to explain the operations performed on the lath machine.

3- The student must be able to identify the tools used on the lath .

4- The student must be able to analyze and explain the causes of the particular phenomenon.

**Skills**

1- Scientific skills : The ability to use lath machine.

2- Intellectual skills : The ability to produce products at the lowest cost and in the shortest time .

3-communication skills : The ability to write a good report .

**Values**

Acquire the skill and ability to interact with devices and machines and use them to conduct special operations and measure products produced in workshops.

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| The first | 2 hours | Student comprehension of the subject | Engineering tolerances, duplexities, duplex systems, tolerance ranks, duplex units, basic deviations. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Second | 2 hours | Student comprehension of the subject | Types of tolerances, foundation system, column foundation system, codes of duplications, tolerances For free dimensions, detailed duplications, selection dualities and their economic advantages. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Third | 2 hours | Student comprehension of the subject | Geometric tolerances in shape and position and types shape and position tolerances. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Fourth | 2 hours | Student comprehension of the subject | Measurement limiters, design of measurement parameters, types of measurement parameters) internal | Theoretical lecture and the use of the screen the means | Commentary, discussion |

| | | | | | |
|---|---|---|---|---|---|
| | | | measurement limiters, determinants<br>External measurement, adjustable measurement limiters, solid measuring limiters, special measurement determinants | explanation | |
| Fifth | 2 hours | Student comprehension of the subject | Classification of metal manufacturing, metalworking , introduction to the theory of formation of reich and influencing factors, methods of fixing artifacts including round and non-round and the conclusive limits used and Longitudinal and transverse nutrition. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Sixth | 2 hours | Student comprehension of the subject | Operations that can be performed on the caudal lathe | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Seventh | 2 hours | Student comprehension of the subject | Identify the pens used and how to fix them for artifacts, turning pens. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Eighth | 2 hours | Student comprehension of the subject | Identify the types of turning pen angles, the effect of turning pen angles on the cutting process, types of turning pen metals, cutting conditions, cutting elements, uses of cutting speeds, and the use of tables<br>And speed maps, classification of several pieces in relation to the methods of operation and the number of conclusive limits. | Theoretical lecture and the use of the screen the means explanation | Explanation of topic,discussion solving problem |
| Ninth | 2 hours | Student comprehension of the subject | Methods of producing loot | Theoretical lecture and the use of the screen the means explanation | Explanation of topic,discussion solving problem |
| Tenth | 2 hours | Student comprehension of the subject | The cut-off limit, the emerging cutter limit and the theory of its formation, the factors that affect it, the factors that lead to its reduction in size, cooling and its importance for cutting processes, various cooling fluids. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Eleventh | 2 hours | Student comprehension of the subject | How to conduct the operating card for a group of operations, calculate its elements, and calculate the cutting time for each operation | Theoretical lecture and the use of the screen the means explanation | Explanation of topic,discussion solving problem |

| | | | | | |
|---|---|---|---|---|---|
| Twelfth | 2 hours | Student comprehension of the subject | Factors affecting the selection of cutting speed -1 Influence of the properties of the cutting kit-2. The effect of the working elements, 3-The effect of the properties of the operated metal. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Thirteenth | 2 hours | Student comprehension of the subject | Tower turning machines, automatic, study of the processes that can be operated and analysis of processes on the product | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Fourteenth | 2 hours | Student comprehension of the subject | Operating card | Theoretical lecture and the use of the screen the means explanation | Explanation of topic,discussion solving problem |
| Fifteenth | 2 hours | Student comprehension of the subject | Study how to program automatic programmed lathes and the factors affecting the operating steps. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |

## Course Structure (Practical)

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| The first | 2 hours | Student comprehension of the experience | Lathing: Identify the parts of the lathe and its work. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Second | 2 hours | Student comprehension of experience | Identify the pens used and how to install them for artifacts. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Third | 2 hours | Student comprehension of the experience | Learn how to use tables and speed maps in a lathe. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Fourth | 2 hours | Student comprehension of the experience | Turning, stolen by the drawback method. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Fifth | 2 hours | Student comprehension of the experience | Turning stolen by the method the reproduction device or the side ruler. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Sixth | 2 hours | Student comprehension of the experience | Identify lathe accessories and how to install the workpiece on them (triple sample, quadruple sample) Rotary tray, rotary switch, alley ) | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Seventh | 2 hours | Student comprehension of the experience | Install irregular section workpieces on the rotary tray quad tray and its axes. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | experience |
| Eighth | 2 hours | Student comprehension of the experience | Identify the emerging cutter and how to configure it during the turning process. . | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Ninth | 2 hours | Student comprehension of the experience | Identify the shapes of the reich produced and their relationship to the depth of the cut and other cutting conditions. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Tenth | 2 hours | Student comprehension of the experience | Calculate the cutting time on the lathe and compare it with the theoretical method. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Eleventh | 2 hours | Student comprehension of the experience | Study the causes of the differences that appear between theoretical and practical results. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Twelfth | 2 hours | Student comprehension of the experience | Preparing a card for the sequence of operations. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Thirteenth | 2 hours | Student comprehension of the experience | Programming tower lathes in workshops. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Fourteenth | 2 hours | Student comprehension of the experience | Perform a practical exercise on the lathe | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Fifteenth | 2 hours | Student comprehension of the experience | Perform another practical exercise on the lathe. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |

## 11.Course Evaluation

Evaluation is based on :

١-Semester exam (theoretical + practical) .

٢- Year work , including daily tests, assignments, attendance, and reports .

| | |
|---|---|
| 3- Final exam (theoretical +partical) | |
| 12.Learning and Teaching Resources | |
| Required textbooks (curricular books, if any) | 1- Dr. Qahtan Khalaf Al-Khazraji, Dr. Adel Mahmoud Hassan, "Principles of Production Processes", Second Edition, University of Baghdad,Higher Education Press, 1987. |
| Main references (sources) | 1- E.P.DeGarmo, J.T. Black, and R.A. kohser "Materials and processes in Manufacturing " , Eighth Edition , John Wiley & Sons , 1999 .<br>2- Lawrence E. Doyle, Carl A. keyser, James L. each,George F. Schrader, and Morse B. Singer " Manufacturing processes and Materials for Engineering " , Third Edition, prentice - Hall, Inc.1985 .<br>3- Sherif D.Elwakil " Processes and Design Manufacturing " , Second Edition , PWS PublishingCompany , 1998 . |
| Recommended books and references (scientific journals, reports...) | All sober scientific journals related to metal manufacturing processes. |
| Electronic References, Websites | Websites for manufacturing processes. |

# Course Description Form

| | |
|---|---|
| 13.Course Name: **manufacturing processes٤** | |
| | |
| 14.Course Code: METP21٣ | |
| | |
| 15.Semester / Year: **2024-2025** | |
| | |
| 16.Description Preparation Date:10-6-2025 | |
| | |
| 17.Available Attendance Forms: Attendance (2 hours theoretical + 2 hours of work - an average of 4 hours per week) | |
| | |
| 18.Number of Credit Hours (Total) / Number of Units (Total) | |
| 60 hours /4 | |
| 19. Course administrator's name (mention all, if more than one name) | |
| Name: Eng. Zainab Qusay Shareef<br>Email: mti.lec150.zainab@ntu.edu.iq | |
| 20.Course Objectives | |
| **Course Objectives** | The student shall be able to: |

| | |
|---|---|
| | 1- Milling, scraping and grinding machines used in the workshop.<br>**2-** Identify the type of process performed milling, scraping and grinding machines how to implement them.<br>**3-** Identify the variables of the parts neces for operation.<br>**4-** The operating card is designed for e operation and for each part that is operated |

## 21.Teaching and Learning Strategies

**Strategy**

**Knowledge**

1- The student must be able to identify the parts of milling , Planning and grinding machines.

2- The student must be able to explain the operations performed on the milling , Planning and grinding machines.

3- The student must be able to identify the tools used on the milling , Planning and grinding machines.

.

4- The student must be able to analyze and explain the causes of the particular phenomenon.

**Skills**

1- Scientific skills : The ability to use milling , Planning and grinding machines.

2- Intellectual skills : The ability to produce products at the lowest cost and in the shortest time .

3-communication skills : The ability to write a good report .

**Values**

Acquire the skill and ability to interact with devices and machines and use them to conduct special operations and measure products produced in workshops.

## 22. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| The first | 2 hours | Student comprehension of the subject | Engineering tolerances, duplexities, duplex systems, tolerance | Theoretical lecture and the use of the screen | Commentary, discussion |

| | | | | | |
|---|---|---|---|---|---|
| | | | ranks, duplex units, basic deviations. | the means explanation | |
| Second | 2 hours | Student comprehension of the subject | Types of tolerances, foundation system, column foundation system, codes of duplications, tolerances For free dimensions, detailed duplications, selection dualities and their economic advantages. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Third | 2 hours | Student comprehension of the subject | Geometric tolerances in shape and position and types shape and position tolerances. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Fourth | 2 hours | Student comprehension of the subject | Measurement limiters, design of measurement parameters, types of measurement parameters) internal measurement limiters, determinants External measurement, adjustable measurement limiters, solid measuring limiters, special measurement determinants | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Fifth | 2 hours | Student comprehension of the subject | Classification of metal manufacturing, metalworking , introduction to the theory of formation of reich and influencing factors, methods of fixing artifacts including round and non-round and the conclusive limits used and Longitudinal and transverse nutrition. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Sixth | 2 hours | Student comprehension of the subject | Operations that can be performed on the caudal lathe | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Seventh | 2 hours | Student comprehension of the subject | Identify the pens used and how to fix them for artifacts, turning pens. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Eighth | 2 hours | Student comprehension of the subject | Identify the types of turning pen angles, the effect of turning pen angles on 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 several pieces | Theoretical lecture and the use of the screen the means explanation | Explanation of topic,discussion solving problem |

| | | | | | |
|---|---|---|---|---|---|
| | | | in relation to the methods of operation and the number of conclusive limits. | | |
| Ninth | 2 hours | Student comprehension of the subject | Methods of producing loot | Theoretical lecture and the use of the screen the means explanation | Explanation of topic,discussion solving problem |
| Tenth | 2 hours | Student comprehension of the subject | The cut-off limit, the emerging cutter limit and the theory of its formation, the factors that affect it, the factors that lead to its reduction in size, cooling and its importance for cutting processes, various cooling fluids. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Eleventh | 2 hours | Student comprehension of the subject | How to conduct the operating card for a group of operations, calculate its elements, and calculate the cutting time for each operation | Theoretical lecture and the use of the screen the means explanation | Explanation of topic,discussion solving problem |
| Twelfth | 2 hours | Student comprehension of the subject | Factors affecting the selection of cutting speed -1 Influence of the properties of the cutting kit-2. The effect of the working elements, 3-The effect of the properties of the operated metal. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Thirteenth | 2 hours | Student comprehension of the subject | Tower turning machines, automatic, study of the processes that can be operated and analysis of processes on the product | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |
| Fourteenth | 2 hours | Student comprehension of the subject | Operating card | Theoretical lecture and the use of the screen the means explanation | Explanation of topic,discussion solving problem |
| Fifteenth | 2 hours | Student comprehension of the subject | Study how to program automatic programmed lathes and the factors affecting the operating steps. | Theoretical lecture and the use of the screen the means explanation | Commentary, discussion |

## Course Structure (Practical)

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method | Evaluation method |
|---|---|---|---|---|---|
| The first | 2 hours | Student comprehension of the experience | Lathing: Identify the parts of the lathe and its work. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Second | 2 hours | Student comprehension of experience | Identify the pens used and how to install them for artifacts. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |

| | | | | | |
|---|---|---|---|---|---|
| Third | 2 hours | Student comprehension of the experience | Learn how to use tables and speed maps in a lathe. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Fourth | 2 hours | Student comprehension of the experience | Turning, stolen by the drawback method. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Fifth | 2 hours | Student comprehension of the experience | Turning stolen by the method the reproduction device or the side ruler. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Sixth | 2 hours | Student comprehension of the experience | Identify lathe accessories and how to install the workpiece on them (triple sample, quadruple sample) Rotary tray, rotary switch, alley ) | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Seventh | 2 hours | Student comprehension of the experience | Install irregular section workpieces on the rotary tray quad tray and its axes. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Eighth | 2 hours | Student comprehension of the experience | Identify the emerging cutter and how to configure it during the turning process. . | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Ninth | 2 hours | Student comprehension of the experience | Identify the shapes of the reich produced and their relationship to the depth of the cut and other cutting conditions. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Tenth | 2 hours | Student comprehension of the experience | Calculate the cutting time on the lathe and compare it with the theoretical method. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Eleventh | 2 hours | Student comprehension of the experience | Study the causes of the differences that appear between theoretical and practical results. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Twelfth | 2 hours | Student comprehension of the experience | Preparing a card for the sequence of operations. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Thirteenth | 2 hours | Student comprehension of the experience | Programming tower lathes in workshops. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |
| Fourteenth | 2 hours | Student comprehension of the experience | Perform a practical exercise on the lathe | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | experience |
| Fifteenth | 2 hours | Student comprehension of the experience | Perform another practical exercise on the lathe. | Practical experience and use of the screen explanation | Explanation of the topic, discussion, practical experience |

## 23.Course Evaluation

Evaluation is based on :

١-Semester exam (theoretical + practical) .
٢- Year work , including daily tests, assignments, attendance, and reports .
3- Final exam (theoretical +partical)

## 24.Learning and Teaching Resources

| | |
|---|---|
| Required textbooks (curricular books, if any) | 1- Dr. Qahtan Khalaf Al-Khazraji, Dr. Adel Mahmoud Hassan, "Principles of Production Processes", Second Edition, University of Baghdad,Higher Education Press, 1987. |
| Main references (sources) | 1- E.P.DeGarmo, J.T. Black, and R.A. kohser "Materials and processes in Manufacturing " , Eighth Edition , John Wiley & Sons , 1999 .<br>2- Lawrence E. Doyle, Carl A. keyser, James L. each,George F. Schrader, and Morse B. Singer " Manufacturing processes and Materials for Engineering " , Third Edition, prentice - Hall, Inc.1985 .<br>3- Sherif D.Elwakil " Processes and Design Manufacturing " , Second Edition , PWS PublishingCompany , 1998 . |
| Recommended books and references (scientific journals, reports...) | All sober scientific journals related to metal manufacturing processes. |
| Electronic References, Websites | Websites for manufacturing processes. |

## Course Description

The student understands the principles of engineering mechanics2 and how to perform design calculations for each part when a collapse occurs due to external forces or structure through the stresses formed in that part.

| |
|---|
| 1. Course Name: |
| Principles of Engineering Mechanics 2 |
| 2. Course Code: |
| **MET120** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (2 hours theoretical + 3 hours of work - an average of 5 hours |

| |
|---|
| week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 75 hours /5 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Iman Zidan Ali<br>Email: eman.zaidan1962@ntu.edu.iq<br>Name: hussien abdualkarem ibrahim<br>Email: alhusaenyhusaen@ntu.edu.iq |

| **9. Course Objectives** |
|---|
| 1. Clarifying the role of the principles of engineering mechanics<br>2. The relationship that binds these parts together,<br>3. How to make some calculations to design these parts and identify all the factors affecting them. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br>1. Recognize the concepts of engineering mechanics.<br>2. Expand students' perceptions and enhance the concept of design by giving them principles and design calculations.<br>3. Give the student experience in fees for different machine parts. |
| **B - Skills objectives of the course.**<br>1. A detailed study of the engineering design of the principles of engineering mechanics<br>2. Study the mathematical details that the student needs during the principles of engineering mechanics<br>3. Prepare the technologist to be a successful technician by learning the correct principles of the mechanical techniques specialization of the production branch. |

**Teaching and learning methods**

1. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.
2. Solve a set of practical and practical examples by the subject teacher.
3. Through discussion, students are involved by solving some practical problems.
4. Asking the student to visit the library and the international information network (Internet) to obtain additional knowledge of the study materials and to observe, maintain and repair the machines in the machinery workshop at the Institute.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teaching the student order and cleanliness
2. Teaching patience and stretching
3. Acquire the quality of good manners and good dealing with auditors

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices, to attract attention and attract students to better reach the idea to the student.
2. Giving students extracurricular assignments that require them to exert skills and self-explanations in experiential ways.
3. Interrogate the students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
4. Using brainstorming and feedback in order to activate the accumulated experiences of students by linking what has been taken from the study materials in the previous academic stages and linking them to the new.
5. Providing students with practical skills by reviewing the machines inside and outside the institute.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. First semester exam (theoretical).
2. The work of the year takes into account daily tests, duties, attendance and participation.
3. Final exam (theoretical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing the skill of accuracy in measurements
2. Developing the skill of cooperation and the alternative system
3. - Enabling students to subject the technology of machine parts in its applied and cognitive aspects.
4. - Develop the student's ability to analyze information and interpret the data obtained through calculations.
5. - Enable the student to conduct a field survey to identify and solve problems on the ground.

**10. Course Structure**

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | Weeks |
|---|---|---|---|---|---|
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Dynamics type of motion, Linear motion with constant speed. | Student comprehension of the subject | 5hours | First |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Linear motion with Constant acceleration. | Student comprehension of the subject | 5 hours | Second |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Newton's Second Law | Student comprehension of the subject | 5 hours | Third |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Curvilinear motion | Student comprehension of the subject | 5 hours | Fourth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Angular motion, Relative Motion. | Student comprehension of the subject | 5 hours | V |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the | Work, Energy, Power | Student comprehension of the subject | 5 hours | Sixth |

| | | | | | |
|---|---|---|---|---|---|
| | screen and the means of explanation | | | | |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Strength of material: Fundamental concept, Loads, Stress, Strain Elasticity, Plasticity, Deformation. | Student comprehension of the subject | 5 hours | Sevent |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Hook's Law, Stress - strain curve, type of stress. | Student comprehension of the subject | 5 hours | Eighth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Normal stress due to an axial load on 1- Uniformam Cross section area 2- Variable cross section area. | Student comprehension of the subject | 5 hours | Ninth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Shear Stress | Student comprehension of the subject | 5 hours | Tenth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Torsional Stress | Student comprehension of the subject | 5 hours | Eleven h |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Beams, types of loads, types of beams. | Student comprehension of the subject | 5 hours | Twelft |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Shear force (S.F.) & bending moment (B.M.) of Simple supported beam under an -axial load. | Student comprehension of the subject | 5 hours | Thirtee nth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Shear force (S.F.) & bending moment (B.M.) of Simple supported beam under uniform distributed Load | Student comprehension of the subject | 5 hours | Fourte nth |
| Discussion, Quick Exam, Problem | Theoretical lecture and the | Shear force (S.F.) & | Student comprehension of | 5 hours | Fifteen h |

| | | | | | |
|---|---|---|---|---|---|
| Solving, Homework | use of the screen and the means of explanation | bending moment (B.M.) of cantilever beam under an -axial load. Shear force (S.F.) & bending moment (B.M.) of cantilever beam under uniform distributed load. | the subject | | |

| **12. Infrastructure** | |
|---|---|
| **1. Required text books** | **Engineering Mechanics** Book |
| **2. Main references (sources)** | 1. Engineering Mechanics Statics and Dynamics Authors R. C. Hibbeler · 2013<br>2. Strength of Material by Ferdinal L . Singer<br>3. Strength of Materials by R.S.Khurmi. |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of design |
| **B- Electronic references, websites ....** | Engineering Mechanics Websites |

## Course Description Form

## Course Description: Engineering Materials

**The student studies the engineering and physical properties of materials in terms of their composition and classifications, as well as their electrical, magnetic and chemical properties, in addition to identifying the most important metal materials involved in the world of engineering such as iron, copper and aluminum, as well as non-metallic materials such as plastic, rubber and dyes.**

| |
|---|
| 1. Course Name: |
| Engineering Metarials |
| 2. Course Code: |
| **MET128** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (2 hours theoretical + 2 hours of work - an average of 4 hours p week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 60 hours /4 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Ibrahim Khalil Ibrahim<br>Email: mti.lec12.ibrahim@ntu.edu.iq<br>Name: hussien abdualkarem ibrahim<br>Email: alhusaenyhusaen@ntu.edu.iq |

| **9. Course Objectives** |
|---|
| 1. Recognize the science of material properties<br>2. Identify engineering materials, their types and classifications<br>3. Learn about the atomic and crystal structure of materials,<br>4. recognize the magnetic and electrical properties of materials,<br>5. Learn about the chemical properties of substances<br>6. Identify some metallic and non-metallic materials involved in the engineering fields and their areas of use and applications. |

| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
|---|
| **A- Cognitive objectives**<br>1. The student learns the engineering properties of materials and how to benefit from them in practical application.<br>2. Expanding students' perceptions and enhancing their concept in terms of engineering materials and their applications.<br>3. The student knows how to choose from several subjects according to the desired application. |
| |
| **Teaching and learning methods**<br>1. Provide students with the basics and topics related to the previous learning outcomes of skills to solve practical problems through presentation or lecture.<br>2. Solve a set of practical and practical examples by the subject teacher.<br>3. Asking the student to search for the properties of new materials and how to benefit from them in engineering fields<br>4. Asking the student to work in a group for the purpose of preparing reports and research in the fields of material properties |
| **Evaluation methods** |
| 1. Daily interaction and topic preparation.<br>2. Daily and weekly tests.<br>3. Quarterly and final exams. |
| **C. Emotional and value goals**<br>1. Teach the student order and hygiene.<br>2. Teaching patience and prolongation.<br>3. Acquire the quality of good character and good dealing with auditors. |
| **Teaching and learning methods** |
| 1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices , to attract attention and attract students to better reach the idea to the student.<br>2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.<br>3. Using modern teaching methods such as animation films as well as videos for practical experiences. |
| **Evaluation methods** |
| The evaluation is carried out on the basis of:<br>1. Semester exam (theoretical).<br>2. The work of the year takes into account daily tests, assignments, attendance and reports.<br>3. Final exam (theoretical). |

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing the skill of accuracy in understanding the behaviors of materials, especially engineering
2. Enable students to theoretically attribute the material and link it with drawings and shapes.
3. Develop the student's ability to analyze information and interpret the data obtained through experiments that clarify the properties of materials.

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Surprise questions during the lecture and daily, monthly and final exams | Explanation of the topic Use a video and a legend and use Data Show | Definition of Engineering Materials | Student comprehension of the subject | 2 | First |
| | | Definition and clarification of atoms, element, bonds (bonds) | Student comprehension of the subject | 2 | Second |
| | | Types of bonds in engineering materials | Student comprehension of the subject | 2 | Third |
| | | Crystalline or crystalline materials | Student comprehension of the subject | 2 | Fourth |
| | | (H.C.P.)F.C.C( (B.C.C) Crystalline Shapes | Student comprehension of the subject | 2 | Fifth |
| | | Mechanical properties of materials (stress, stress-strain curve) | Student comprehension of the subject | 2 | Sixth |
| | | Ductility, Collapse | Student comprehension of the subject | 2 | Seventh |
| | | Hardness, hardness test | Student comprehension of the subject | 2 | Eighth |
| | | Durability , Durability | Student comprehension of | 2 | Ninth |

| | | | | | |
|---|---|---|---|---|---|
| | | Test | the subject | | |
| | | Thermal properties of materials | Student comprehension of the subject | 2 | Tenth |
| | | Sequel | Student comprehension of the subject | 2 | Eleventh |
| | | Electrical properties of materials (flexible materials, insulating materials, metal materials, | Student comprehension of the subject | 2 | Twelfth |
| | | Factors affecting electrical conductivity | Student comprehension of the subject | 2 | Thirteenth |
| | | Sequel | Student comprehension of the subject | 2 | Fourteenth |
| | | Chemical properties of materials (corrosion, electrochemical chain, oxidation) | Student comprehension of the subject | 2 | Fifteenth |

| 12. Infrastructure | |
|---|---|
| **1. Required textbooks** | |
| **2. Main references (sources)** | |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of materials |
| **B- Electronic references, websites ....** | Engineering Materials Websites |

## Course Description Form

## Course Description :Mathematics 1

Introducing the student to the use of mathematics1 in other scientific topics and increasing his ability to think logically when solving exercises, as well as increasing his ability to develop and how to link data with his information to obtain a problem solution.

| |
|---|
| 1. Course Name: |
| Mathematics 11 |
| 2. Course Code: |
| **MTI100** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (2 hours theoretical - an average of 2 hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 hours /2 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Ghada Yousef Ismail<br>Email: ghadayousif1964@ntu.edu.iq |

| |
|---|
| **1. Course Objectives** |
| 1. Clarify the basics of mathematics and mathematical laws.<br>2. Knowledge of linking theoretical topics with applied topics.<br>3. Teaching students the derivation of all types of mathematical functions and integration as well. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br>1. The student is introduced to the basic concepts in mathematics.<br>2. Expanding students' perceptions and promoting concepts of mathematics and its importance in life as it enters into all kinds of sciences |
| **B - Skills objectives of the course.** |

1. A detailed study of mathematics concepts.
2. A detailed study of the laws of mathematics that include the above course.

**Teaching and learning methods**

1. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.
2. Solve a set of practical and practical examples by the subject teacher.
3. Asking the student to solve arithmetic problems and solve in different ways to gain skill in the methods of calculating mathematical laws.
4. Asking the student to bring assignments for each topic in the lecture.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teach the student order and hygiene.
2. Teaching patience and prolongation.
3. Acquire the quality of good character and good dealing with auditors.

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices , to attract attention and attract students to better reach the idea to the student.
2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
3.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. Semester exam (theoretical).
2. The work of the year takes into account daily tests, assignments, attendance and assignments.
3. Final exam (theoretical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Graduating qualified people who possess scientific logical thinking and scientific research skills in mathematics.
2. Enabling students with mathematics and its applications.
3. Develop the student's ability to analyze information and interpret the data obtained through calculations.

**11. Course Structure (Theoretical)**

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Determinants and their properties, solving equations by the determinant method (Kramer) | Student comprehension of the subject | 2 hours | First |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Second |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Differentiation, algebra of derivatives, multiple functions | Student comprehension of the subject | 2 hours | Third |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Fourth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | fifth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Trigonometric, logarithmic, exponential functions and their derivatives and implicit functions, the chain rule. | Student comprehension of the subject | 2 hours | Sixth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Seventh |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Eighth |
| Explanation of the topic, | Theoretical lecture and the use of the | Drawing functions, drawing a trigonometric function and maximum and minimum | Student comprehension of the subject | 2 hours | Ninth |

| | | | | | |
|---|---|---|---|---|---|
| discussion, solving problems | screen and the means of explanation | limits. | | | |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Tenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Eleventh |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Applications of physical differentiation, speed and acceleration and applications of engineering differentiation. | Student comprehension of the subject | 2hr | Twelft |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Thirteenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Integral, laws, and its relationship to differentiation, definite and indefinite integration | Student comprehension of the subject | 2 hours | Fourteenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Fifteenth |

| 12. Infrastructure | |
|---|---|
| **1. Required textbooks** | Mathematics for codification: written by Professor Obaid Mahmoud Al-Zobaie and Professor Adnan Salem Al-Saffar |
| **2. Main references (sources)** | Calculus: by Frank Ayers Jr. and Eliot Mendelssohn |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals related to mathematics |
| **B- Electronic references, websites ....** | Math websites |

## Course Description Form

## Course Description :Calculus

Introducing the student to the use of mathematics2 in other scientific topics and increasing his ability to think logically when solving exercises, as well as increasing his ability to develop and how to link data with his information to obtain a problem solution.

| 1. Course Name: |
|---|
| Differentiation andIntegration |
| 2. Course Code: |
| **MTI100** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (2 hours theoretical - an average of 2 hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 hours /2 |

| 7. Course administrator's name (mention all, if more than one name) |
|---|
| Name: Ghada Yousef Ismail<br>Email: ghadayousif1964@ntu.edu.iq |

**9. Course Objectives**

1. Clarify the basics of mathematics and mathematical laws.
2. Knowledge of linking theoretical topics with applied topics.
3. Teaching students the derivation of all types of mathematical functions and integration as well.

**10. Course Outcomes and Methods of Teaching, Learning and Assessment**

**A- Cognitive objectives**

1. The student is introduced to the basic concepts in mathematics.
2. Expanding students' perceptions and promoting concepts of mathematics and its importance in life as it enters into all kinds of sciences

**B - Skills objectives of the course.**

1. A detailed study of mathematics concepts.
2. A detailed study of the laws of mathematics that include the above course.

**Teaching and learning methods**

1. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.
2. Solve a set of practical and practical examples by the subject teacher.
3. Asking the student to solve arithmetic problems and solve in different ways to gain skill in the methods of calculating mathematical laws.
4. Asking the student to bring assignments for each topic in the lecture.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teach the student order and hygiene.
2. Teaching patience and prolongation.
3. Acquire the quality of good character and good dealing with auditors.

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices , to attract attention and attract students to better

reach the idea to the student.

2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
3.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. Semester exam (theoretical).
2. The work of the year takes into account daily tests, assignments, attendance and assignments.
3. Final exam (theoretical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Graduating qualified people who possess scientific logical thinking and scientific research skills in mathematics.
2. Enabling students with mathematics and its applications.
3. Develop the student's ability to analyze information and interpret the data obtained through calculations.

## 11. Course Structure (Theoretical)

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | Implicit integration, geometric (areas and volumes) and physical integration applications | Student comprehension of the experience | 2 hours | First |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Second |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Third |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Fourth |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | General methods of substitution and partial integration and the use of exponential and logarithmic partial fractions | Student comprehension of the experience | 2 hours | Fifth |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Sixth |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Seventh |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | Discrete, homogeneous and linear differential equations with their different applications | Student comprehension of the experience | 2 hours | Eighth |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Ninth |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Tenth |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and | | Student comprehension of the experience | 2 hours | Eleventh |

| | | | | | |
|---|---|---|---|---|---|
| | explanation | | | | |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | vectors (vector and quantum multiplication and calculation of angles between vectors). | Student comprehension of the experience | 2 hours | Twelft |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Thirtee nth |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | Statistics (principles) and probability theory | Student comprehension of the experience | 2 hours | Fourte nth |
| Explanation of the topic, discussion, solving problems | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 2 hours | Fifteen h |

| **12. Infrastructure** | |
|---|---|
| **1. Required text books** | Mathematics for codification: written by Professor Obaid Mahmoud Al-Zobaie and Professor Adnan Salem Al-Saffar |
| **2. Main references (sources)** | Calculus: by Frank Ayers Jr. and Eliot Mendelssohn |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals related to mathematics |
| **B-Electronic references, websites ....** | Math websites |

## Course Description Form

## Course Description :Electrical Technology

**The student studies the basics of electricity technology and various electric motors, their theory of operation, methods of operation, how to repair**

**electrical faults and maintain them, and how to deal with electrical elements and laboratory devices for laboratory experiments.**

| |
|---|
| 1. Course Name: |
| Electrical Technology |
| 2. Course Code: |
| **TIMO208** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (2 hours theoretical + 2 hours of work - an average of 4 hours p week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 60 hours /4 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Suhib Fikri hamed<br>Email: mti.lec173.suhib@ntu.edu.iq |

| |
|---|
| **1. Course Objectives** |
| 1. Clarify the basics of electricity and electrical symbols.<br>2. Knowledge of connecting parts and electric motors.<br>3. How to perform calculations to calculate current, voltages, resistance and power.<br>4. Teaching students how to deal with various electrical elements and laboratory equipment correctly and according to their danger, taking into account occupational safety.<br>5. Developing students' skills through mental questions, answers and special tests in the laboratory and linking them theoretically with theoretical topics.<br>6. Developing students' skills in the field of electricity related to mechanical devices and machines. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br>1- The student is introduced to the basic concepts of electricity.<br>2- Expanding students' perceptions, enhancing their concept, and linking electricity and mechanical machines. |

3- The student knows how to measure and connect electrical circuits.

**B - Skills objectives of the course.**

1. Detailed study of connecting electrical circuits.
2. A detailed study of how Ohm's law of electrical circuits is calculated.
3. Explain the importance of practical experiments for students in the electrical technology laboratory with conducting these experiments themselves and the importance of this in their scientific and practical career.
4. Preparing students to be technicians with experience in connecting electrical circuits, how to calculate them, connect them to mechanical machines and how to operate them.

**Teaching and learning methods**

1. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.
2. Solve a set of practical and practical examples by the subject teacher.
3. Asking the student to solve arithmetic problems and solve in different ways to gain skill in the methods of calculating electrical circuits.
4. Require the student to bring reports for each practical experiment in the laboratory.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teach the student order and hygiene.
2. Teaching patience and prolongation.
3. Acquire the quality of good character and good dealing with auditors.

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices, to attract attention and attract students to better reach the idea to the student.
2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
3. Providing students with practical skills by conducting experiments on electrical appliances inside the laboratory and viewing electrical equipment outside it.

**Evaluation methods**

The evaluation is carried out on the basis of:

1- Semester exam (theoretical + practical).

2- The work of the year takes into account daily tests, assignments, attendance and reports on experiments.

3- Final exam (theoretical + practical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing the skill of accuracy in the calculations of electrical circuits.
2. Enabling students to master electricity technology theoretically, computationally and practically.
3. Develop the student's ability to analyze information and interpret the data obtained by performing practical electrical circuit calculations and calculating them theoretically as well.

**12. Course Structure (Theoretical)**

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Fundamental of Electricity<br><br>Electrical Units and Symbols, Ohm Law, Electrical Circuits and Examples | Student comprehension of the subject | 1 hour | First |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Second |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Third |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Fourth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Fifth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Alternating Current<br><br>AC Current, Sine Wave and Examples | Student comprehension of the subject | 1 hour | Sixth |
| Explanation of | Theoretical lecture and the | | Student comprehension of | 1 hour | Seventh |

| | | | | | |
|---|---|---|---|---|---|
| the topic, discussion, solving problems | use of the screen and the means of explanation | | the subject | | |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Three Phase System<br><br>Three Phase Generator, Delta, Star and Examples. | Student comprehension of the subject | 1 hour | Eighth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Ninth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Electromagnetics<br><br>Magnetic Materials, Permanent Magnet, Magnetic Flux, Flux Density, Electromagnetic Induction and Examples. | Student comprehension of the subject | 1 hour | Tenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Eleventh |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Twelfth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | The Transformer and AC Machines<br><br>The Transformer, Step-Up / Step-Down Transformer, AC Machines, Three Phase Induction Motor and Examples. | Student comprehension of the subject | 1 hour | Thirteenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Fourteenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 1 hour | Fifteenth |

## 12. Course Structure (Practical)

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Identify the laboratory, power sources, electrical appliances. | Student comprehension of the experience | 2 hours | First |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Study of the AFO device and how to use it to measure electric current and potential difference and resistance. | Student comprehension of the experience | 2 hours | Second |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Recognize the terminology of the color resistance system. | Student comprehension of the experience | 2 hours | Third |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Realization of Ohm's law in practice. | Student comprehension of the experience | 2 hours | Fourth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Connecting resistors in series and parallel in the electrical circuit and finding equivalent resistance for measurement. | Student comprehension of the experience | 2 hours | Fifth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Different electrical circuits (sequential, parallel) and the study of their properties, finding the equivalent resistance. | Student comprehension of the experience | 2 hours | Sixth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Study the effect of overheating on resistance. | Student comprehension of the experience | 2 hours | Seventh |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Set the value of different specific resistance, types of conductive materials. | Student comprehension of the experience | 2 hours | Eighth |

| | | | | | |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Measurement of electrical power from DC circuits. | Student comprehension of the experience | 2 hours | Ninth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Measurement of power in three-sided alternating current circuits. | Student comprehension of the experience | 2 hours | Tenth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | The use of electric caustic and training in welding methods and the work of electrical connections. | Student comprehension of the experience | 2 hours | Eleventh |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Training on the establishment of electrician and the work of exercises to establish a light bulb and a switch in Simple circuit. | Student comprehension of the experience | 2 hours | Twelfth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Make a check and operate panel containing a socket and a succession lamp, a parallel socket and a sink. | Student comprehension of the experience | 2 hours | Thirteenth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Establish a lamp in two ways. | Student comprehension of the experience | 2 hours | Fourteenth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and legend | Examine the three-sided impact motor and identify its parts, disassemble them and prepare their installation. | Student comprehension of the experience | 2 hours | Fifteenth |

| **12. Infrastructure** | |
|---|---|
| **1. Required text books** | 1. Theraga.<br>2. Hughes.<br>3. Erick Singer. |
| **2. Main references (sources)** | 1. Electrical Technology by – Theraga<br>2. Electrical Technology by – Hughes |

| | |
|---|---|
| | 3. Electrical Technology by – Erick Singer |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of design |
| **B- Electronic references, websites ....** | Electrical Technology Websites |

## Course Description Form

## Course Description: Engineering Drawing

**The student studies the foundations of engineering drawing, sometimes called mechanical drawing or machine drawing, but it is an artistic, engineering and industrial language. Like any language, it is used to understand and transfer industrial and engineering ideas between people, whether it is through writing (preparing drawings) or by reading (studying drawings that have already been prepared).**

| |
|---|
| 1. Course Name: |
| Machine Drawing 1 |
| 2. Course Code: |
| **METP220** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |

| |
|---|
| Attendance (hours of work - an average of  hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 45 hours /3 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Hasan Mahmood kaedhi<br>Email: hasankaedhi@ntu.edu.iq |

| |
|---|
| **1. Course Objectives** |
| Upon completion of this training module, the trainee has:<br><br>1- Active/Review the necessary basics of the engineering drawing language.<br>2- Normative systems regulating engineering and technical drawing operations.<br>3- Types of drawing lines.<br>4- Drawing projections of the perspective or stereoscopic shape. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br>1. The student is introduced to the basic concepts of engineering drawing.<br>2. Expanding students' perceptions, enhancing their concept, and linking engineering drawing with mechanical machines.<br>3. The student's knowledge of how to draw and use the computer |
| **B - Skills objectives of the course.**<br>1. Detailed study of engineering drawing.<br>2. A detailed study of the AutoCAD program and how to harness the program in integrating fees.<br>3. Preparing students to be technicians with experience in engineering drawing, how to analyze drawings, link them to mechanical machines and how to operate them. |
| **Teaching and learning methods**<br>1. Providing students with the basics and topics related to the previous learning outcomes of skills to solve practical problems through recitation, lecture or drawing different geometric shapes.<br>2. Draw a set of different exercises applied by the subject teacher.<br>3. Asking the student to draw exercises of different shapes and models to gain skill in the methods of learning engineering drawing. |

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teaching the student the system.
2. Teaching patience and prolongation.
3. Acquire the quality of good character and good dealing with auditors.

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices , to attract attention and attract students to better reach the idea to the student.
2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
3. Providing students with practical skills by drawing exercises of geometric shapes, isometric perspective and models inside the laboratory.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. Semester exam (practical).
2. The work of the year takes into account daily tests, assignments and attendance.
3. Final exam (practical).

**13. Course Structure (Practical)**

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | The importance of engineering drawing, the importance of using the computer to implement the engineering drawing, the sizes of standard drawing boards, an overview of the AutoCAD program. Title Block | Student comprehension of the subject | 3 hours | First |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the subject | 3 hours | Second |
| Topic Explanation, Discussion, | Use the screen and explanation | | Student comprehension of the subject | 3 hours | Third |

| | | | | | |
|---|---|---|---|---|---|
| Daily Exam Exercise Drawing | | | | | |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Drawing geometric shapes using the computer. | Student comprehension of the subject | 3 hours | Fourth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the subject | 3 hours | Fifth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Drawing geometric shapes using the computer. | Student comprehension of the subject | 3 hours | Sixth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the subject | 3 hours | Seventh |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Graphic adjustments, computer aids. | Student comprehension of the subject | 3 hours | Eighth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the subject | 3 hours | Ninth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Types of lines for engineering drawing, engineering operations<br>. | Student comprehension of the subject | 3 hours | Tenth |

| | | | | | |
|---|---|---|---|---|---|
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the subject | 3 hours | Eleventh |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the subject | 3 hours | Twelfth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and legend | Various advanced exercises in geometric shapes (engineering operations) | Student comprehension of the subject | 3 hours | Thirteenth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and legend | | Student comprehension of the subject | 3 hours | Fourteenth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and legend | | Student comprehension of the subject | 3 hours | Fifteenth |

| 12. Infrastructure | |
|---|---|
| **1. Required textbooks** | **1- "Fundamental of engineering drawing", Feench and Vierck.2- "Engineering drawing", S. Bogolyubove N. Voinov** |
| **2. Main references (sources) Arabic** | **-1 Engineering Drawing", Abdul Rasoul Al-Khafaf**<br><br>**"-2Engineering Drawing Technology", Fapert & Vander** |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of design |
| **B- Electronic references, websites ....** | Engineering drawing website |

## Course Description Form

## Course Description: Mechanical Drawing

**The student studies the foundations of engineering drawing2 (sometimes called mechanical drawing or machine drawing), but it is an artistic, engineering and industrial language. Like any language, it is used to understand and transmit industrial and engineering ideas between people, whether it is through writing (preparing drawings) or by reading (studying drawings that have already been prepared).**

| 1. Course Name: |
|---|
| Engineering drawing |
| 2. Course Code: |
| **MTI102** |
| 3. Semester / Year: |

| |
|---|
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (hours of work - an average of  hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 45 hours /3 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Waleed Mohamed Najem<br>Email: Waleed.M.Najm@ntu.edu.iq<br>Name: Abdalrahman Fathi Ahmed<br>Email: abdalrahman.fathi@ntu.edu.iq<br><br>Name: Waad Mohamed Mahmood<br>Email: waad.m.mahmood@ntu.edu.iq |

| |
|---|
| **1. Course Objectives** |
| Upon completion of this training module, the trainee has:<br><br>1- Active/Review the necessary basics of the engineering drawing language.<br>2- Normative systems regulating engineering and technical drawing operations.<br>3- Drawing projections of the perspective or stereoscopic shape. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives** .<br>1. Expanding students' perceptions, enhancing their concept, and linking engineering drawing with mechanical machines.<br>2. The student knows how to draw three-dimensional shapes |
| **B - Skills objectives of the course.**<br>1. Detailed study of engineering drawing.<br>2. A detailed study of the AutoCAD program and how to harness the program in integrating fees.<br>3. Preparing students to be technicians with experience in engineering drawing, how to analyze drawings, link them to mechanical machines and how to operate them. |
| **Teaching and learning methods**<br>1. Providing students with the basics and topics related to the previous learning |

outcomes of skills to solve practical problems through recitation, lecture or drawing different geometric shapes.

2. Draw a set of different exercises applied by the subject teacher.

3. Asking the student to draw exercises of different shapes and models to gain skill in the methods of learning engineering drawing.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teaching the student the system.
2. Teaching patience and prolongation.
3. Acquire the quality of good character and good dealing with auditors.

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices, to attract attention and attract students to better reach the idea to the student.
2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
3. Providing students with practical skills by drawing exercises of geometric shapes, isometric perspective and models inside the laboratory.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. Semester exam (practical).
2. The work of the year takes into account daily tests, assignments and attendance.
3. Final exam (practical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing the skill of accuracy in engineering drawing.
2. Enabling students to study engineering drawing theoretically and practically.

## 13. Course Structure (Practical)

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Draw perspective. | Student comprehension of the experience | 3 hours | First |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the experience | 3 hours | Second |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the experience | 3 hours | Third |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Draw a perspective that contains a circle represented by an oval. | Student comprehension of the experience | 3 hours | Fourth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the experience | 3 hours | Fifth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Projection theory | Student comprehension of the experience | 3 hours | Sixth |
| Topic Explanation, Discussion, Daily Exam | Use the screen and explanation | Drawing simplified projections. | Student comprehension of the experience | 3 hours | Seventh |

| | | | | | |
|---|---|---|---|---|---|
| Exercise Drawing | | | | | |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the experience | 3 hours | Eighth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Main projections - even angles - drawing according to the theory of the first even projection angle | Student comprehension of the experience | 3 hours | Ninth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the experience | 3 hours | Tenth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Conclusion of the third projection of the projection. Deduce perspective from two or three projections. | Student comprehension of the experience | 3 hours | Eleventh |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the experience | 3 hours | Twelfth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | | Student comprehension of the experience | 3 hours | Thirteenth |
| Topic Explanation, Discussion, Daily Exam Exercise Drawing | Use the screen and explanation | Cutting theory, cutting shapes and lines according to the type of material, drawing cut projections.<br>Draw projections cut from a given single projection. | Student comprehension of the experience | 3 hours | Fourteenth |
| Topic | Use the screen and | | Student comprehension of | 3 hours | Fifteenth |

| | | | | | |
|---|---|---|---|---|---|
| Explanation, Discussion, Daily Exam Exercise Drawing | explanation | | the experience | | |

| **12. Infrastructure** | |
|---|---|
| **1. Required textbooks** | **1- "Fundamental of engineering drawing", Feench and Vierck.2- "Engineering drawing", S. Bogolyubove N. Voinov** |
| **2. Main references (sources) Arabic** | **-1 Engineering Drawing", Abdul Rasoul Al-Khafaf**<br><br>**"-2Engineering Drawing Technology", Fapert & Vander** |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of design |
| **B-Electronic references, websites ....** | Engineering drawing website |

## Course Description Form

## Course Description: Computer

**Course Objective: Introduce the student to the calculator with an idea of its prospects and use in different fields and the principles of programming and give him a skill in using the calculator to implement programs prepared previously for application in his field of specialization.**

**This course description provides a requisite brevity that inspired the course characteristics and the learning outcomes expected of the student to achieve, proving whether**

**Make the most of the learning opportunities available. It must be linked to the program description.**

1. Course Name:

Computer

2. Course Code:

**NTU 102**

3. Semester / Year:

**2024-2025**

4. Description Preparation Date:

10-6-2025

5. Available Attendance Forms:

Available Attendance Forms: Attendance (1 hours theoretical + 1 hours of wo
- an average of 2 hours per week)

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

30 hours /2

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

Name: Zainab Qusay shareef
Email: mti.lec150.zainab@ntu.edu.iq
Name: Waad Mohamed Mahmood
Email: waad.m.mahmood@ntu.edu.iq

## 9. Course Objectives

Upon completion of this training module, the trainee has:

Learn the principles of calculator and give him skill in using calculator and its applications

## 10. Course Outcomes and Methods of Teaching, Learning and Assessment

**A- Cognitive objectives**

1-Make the student able to know and understand the basics of the computer
2- Make the student able to know and understand the basics of programming through the use of modern software and keep pace with scientific development.
3- Enable the student to obtain knowledge and understanding in the use of calculator and task programs

**B - Skills objectives of the course.**

1. Scientific skills

2. Usage and development skills
3. Thinking and analysis skills
4. Skills of the ability to apply the theoretical and practical experience gained from his studies in the areas of practical life, taking into account the limitations in the field of application.

**Teaching and learning methods**

1. Providing students with the basics and topics related to the previous learning outcomes of skills to solve practical problems through recitation, lecture or drawing different geometric shapes.
2. Draw a set of different exercises applied by the subject teacher.
3. Asking the student to draw exercises of different shapes and models to gain skill in using the computer.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teaching the student the system.
2. Teaching patience and prolongation.
3. Acquire the quality of good character and good dealing with auditors.

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices , to attract attention and attract students to better reach the idea to the student.
2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. Semester exam (practical).
2. The work of the year takes into account daily tests, assignments and attendance.
3. Final exam (practical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Guiding the student and developing the desire to identify the importance of using the computer in different fields
2. 2- Guiding the student and developing the desire to learn about solving equations by programming them using the computer

## 14. Course Structure (Theoretical + Practical) Computer

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Introducing the student to the computer, its basics, generations, components, importance, uses. | Student comprehension of the subject | 3 hours | First |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Computer hardware and software components | Student comprehension of the subject | 3 hours | Second |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Windows operating system features and basic requirements System components | Student comprehension of the subject | 3 hours | Third |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Start Menu | Student comprehension of the subject | 3 hours | Fourth |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Task Bar | Student comprehension of the subject | 3 hours | Fifth |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Sequel | Student comprehension of the subject | 3 hours | Sixth |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Control Panel | Student comprehension of the subject | 3 hours | Seventh |
| Explanation of the topic, discussion, solving | Practical lecture and the use of the screen and the means of explanation | Sequel | Student comprehension of the subject | 3 hours | Eighth |

| | | | | | |
|---|---|---|---|---|---|
| problems | | | | | |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Shortcuts in Windows | Student comprehension of the subject | 3 hours | Ninth |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Take advantage of additional programs (Accessories) | Student comprehension of the subject | 3 hours | Tenth |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Internet | Student comprehension of the subject | 3 hours | Eleventh |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Sequel | Student comprehension of the subject | 3 hours | Twelfth |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Internet Search Sites | Student comprehension of the subject | 3 hours | Thirteenth |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Sequel | Student comprehension of the subject | 3 hours | Fourteenth |
| Explanation of the topic, discussion, solving problems | Practical lecture and the use of the screen and the means of explanation | Learn how to get help and its different methods | Student comprehension of the subject | 3 hours | Fifteenth |

| **12. Infrastructure** | |
|---|---|
| **1. Required textbooks** | |

| | |
|---|---|
| **2. Main references (sources) Arabic** | |
| **A-Recommended books and references (scientific journals, reports ,....)** | Laboratory binding ... All sober scientific journals that have to do with the broad concept |
| **B- Electronic references, websites ....** | Computer Websites |

## Course Description:

**Course Objective: Introduce the student to the calculator with an idea of its prospects and use in different fields and the principles of programming and give him a skill in using the calculator to implement programs prepared previously for application in his field of specialization.**

**This course description provides a requisite brevity that inspired the course characteristics and the learning outcomes expected of the student to achieve, proving whether**

**Make the most of the learning opportunities available. It must be linked to the program description.**

| |
|---|
| 1. Course Name: |
| Computer Principles 2 |
| 2. Course Code: |
| **METP220** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Available Attendance Forms: Attendance (1 hours theoretical + 2hours of wo - an average of 2 hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 45 hours /3 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Waleed Mohamed Najem<br>Email: Waleed.M.Najm@ntu.edu.iq |

| |
|---|
| **1. Course Objectives** |
| Upon completion of this training module, the trainee has:<br><br>Learn the principles of calculator and give him skill in using calculator and its applications |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br><br>1. Make the student able to know and understand the basics of the computer.<br>2. Make the student able to know and understand the basics of programming through the use of modern software and keep pace with scientific development.<br>3. Enable the student to obtain knowledge and understanding in the use of calculator and task programs. |
| **B - Skills objectives of the course.**<br>1- Scientific skills<br>2 – Skills of use and development<br>3 - Thinking and analysis skills<br>- 4 Skills of the ability to apply the theoretical and practical experience gained from his studies in the fields of practical life, taking into account the limitations in the field of application. |

**Teaching and learning methods**

1. Providing students with the basics and topics related to the previous learning outcomes of skills to solve practical problems through recitation, lecture or drawing different geometric shapes.
2. Draw a set of different exercises applied by the subject teacher.
3. Asking the student to draw exercises of different shapes and models to gain skill in using the computer.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teaching the student the system.
2. Teaching patience and prolongation.
3. Acquire the quality of good character and good dealing with auditors.

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices , to attract attention and attract students to better reach the idea to the student.
2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. Semester exam (practical).
2. The work of the year takes into account daily tests, assignments and attendance.
3. Final exam (practical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Guiding the student and developing the desire to identify the importance of using the computer in different fields
2. 2- Guiding the student and developing the desire to learn about solving equations by programming them using the computer

**14. Course structure (theoretical + practical)**

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Using Word + Word Program Interface | Student comprehension of the subject | 3 hours | First |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Page layout and sheet size selection | Student comprehension of the subject | 3 hours | Second |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Basic commands in Word | Student comprehension of the subject | 3 hours | Third |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Professional commands in Word | Student comprehension of the subject | 3 hours | Fourth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Save files and print | Student comprehension of the subject | 3 hours | Fifth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Power Point + Power Point interface | Student comprehension of the subject | 3 hours | Sixth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Basic commands in Power Point | Student comprehension of the subject | 3 hours | Seventh |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Sequel | Student comprehension of the subject | 3 hours | Eighth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Power Point Professional Commands | Student comprehension of the subject | 3 hours | Ninth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the | Sequel | Student | 3 hours | Tenth |

| | | | | | |
|---|---|---|---|---|---|
| | screen and the means of explanation | | comprehension of the subject | | |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Excel + Excel interface | Student comprehension of the subject | 3 hours | Eleven h |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Basic commands in Excel | Student comprehension of the subject | 3 hours | Twelft |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Writing equations in Excel system | Student comprehension of the subject | 3 hours | Thirtee nth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Computer Security and Software Licenses | Student comprehension of the subject | 3 hours | Fourte nth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Sequel | Student comprehension of the subject | 3 hours | Fifteen h |

| **12. Infrastructure** | |
|---|---|
| **1. Required textbooks** | |
| **2. Main references (sources) Arabic** | |
| **A-Recommended books and references (scientific journals, reports ,....)** | Laboratory binding ... All sober scientific journals that have to do with the broad concept |
| **B- Electronic references, websites ....** | Computer Websites |

| **13 . Acceptance** | |
|---|---|
| **Prerequisites** | 1. Classroom.<br>2. Laboratory. |

| | |
|---|---|
| | 3. Computers are laboratory.<br>4. Blackboard and accessories.<br>5. Data show. |
| **Minimum number of students** | 8 |
| **Maximum number of students** | 16 |
| **14. Course Development Plan** | |
| The increasing use of information technology or Internet references, and changes in content as a result of keeping pace with the great development in the world of technology and information | |

## Course Description Form

## Course Description: English Language1

**The student studies the basic principles of the English language in terms of using expressions that help him in daily life and how to benefit from them, in addition to the basic rules on which the English language is built in order to prevent errors during reading and writing.**

| |
|---|
| 1. Course Name: |
| English Language |
| 2. Course Code: |
| **NTU 101** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Available Attendance Forms: Attendance (2 hours theoretical - an average o hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 hours /2 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Ashraf Abdalrazaq saed<br>Email: ashraf_tech@ntu.edu.iq |

| |
|---|
| **1. Course Objectives** |
| 1. The students should be able to recognize the English language in an |

advanced way and enable to communicate in a simple way.
2. Learn about modern methods of learning English.
3. Develop the student's speaking and comprehension skills through conversations between students during the lecture.
4. Develop the student's ability to understand terms and how to use them.

**10. Course Outcomes and Methods of Teaching, Learning and Assessment**

**A- Cognitive objectives**

1- Introduce the student to the basic principles of the English language.
2- Expand students' perceptions and enhance their understanding of the different words and expressions used.
3- The student knows how to read and write correctly.

**B - Skills objectives of the course.**

1. A detailed study by developing students' skills for reading, speaking and solving exercises.
2. A detailed study of how different tenses and their rules are formulated.
3. Clarify the meanings of vocabulary and how to use it according to contexts.
4. Preparing students to be able to read various texts, especially scientific ones.

**Teaching and learning methods**

1. Providing students with the basics and related topics to serve the student's scientific career through recitation, lecture or experiments.
2. Solve and illustrate examples by the subject teacher.
3. Involve the student in solving questions with questions directed by the teacher to determine the extent of the student's understanding and comprehension.
4. Give the student homework to solve, read and discuss during the next lecture.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teach the student order and hygiene.
2. Teaching patience and prolongation.
3. Acquire the quality of good manners and good dealing with others.

**Teaching and learning methods**

1. Using the data show in the presentation of the material to attract the student's attention through pictures to deliver the material better.
2. Conducting seminars by asking questions (how, what, when, where, does) for different topics.
3. Providing students with practical skills by solving various questions and providing them with the necessary skills to understand solving methods.

**Evaluation methods**

The evaluation is carried out on the basis of:

1- Semester exam (theoretical).

2- The work of the year takes into account daily tests, assignments, attendance and participation during the lecture.

3- Final exam (theoretical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing speaking skills.
2. Enabling students to master the English language.
3. Developing the student's ability to read and write by applying everything that was discussed during the lectures throughout the course.

## 15. Course Structure (Theoretical)

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | General introduction to language and its basics | Student comprehension of the subject | 2 hours | First |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Second |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Third |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Fourth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Fifth |
| Explanation of the topic, discussion, | Theoretical lecture and the use of the screen and the | Parts of speech | Student comprehension of the subject | 2 hours | Sixth |

| | | | | | |
|---|---|---|---|---|---|
| solving problems | white board | | | | |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Seventh |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | Types of English sentences | Student comprehension of the subject | 2 hours | Eighth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Ninth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | Present, past, progressive, and future tenses | Student comprehension of the subject | 2 hours | Tenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Eleventh |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Twelfth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | Reading paragraphs (Writing laboratory reports) | Student comprehension of the subject | 2 hours | Thirteenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | (Metals and non metals) (Mechanical properties of materials) | Student comprehension of the subject | 2 hours | Fourteenth |
| Explanation of the topic, discussion, | Theoretical lecture and the use of the screen and the | Parts of the house and furniture | Student comprehension of the subject | 2 hours | Fifteenth |

| | | | | | |
|---|---|---|---|---|---|
| solving problems | white board | | | | |

| 12. Infrastructure | |
|---|---|
| | |
| Dictionary | **2. Main references (sources)** |
| Scientific journals and books related to language and its uses | **A-Recommended books and references (scientific journals, reports ,....)** |
| English, conversation and grammar websites. | **B- Electronic references, websites ....** |

# Second stage

**Course Description Form**

**Course Description:** Machine Parts Technology (1)

| |
|---|
| **The student understands the parts of the machines and how to perform the design calculations of each part when a collapse occurs due to external forces or structure through the stresses that form in that part.** |

| 1. Course Name: |
|---|
| Machine Part - 1 |
| 2. Course Code: |
| **METP210** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |

| |
|---|
| 5. Available Attendance Forms: |
| Available Attendance Forms: Attendance (2 hours theoretical - an average o hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 hours /2 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Zainab Mohammed Tahir<br>Email: mti.lec119.zainab@ntu.edu.iq |

| **9. Course Objectives** |
|---|
| 1. Explain the role of mechanical parts in the machine system,<br>2. The relationship that binds these parts together,<br>3. How to make some calculations to design these parts and identify all the factors affecting them. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br>1- Recognize the basic concepts of machine parts.<br>2- Expand students' perceptions and enhance the concept of design by giving them principles and design calculations.<br>3- Give the student experience in fees for different machine parts. |
| **B - Skills objectives of the course.**<br><br>1. A detailed study of the engineering design of the machine parts.<br>2. Study the mathematical details that the student needs during the redesign of the machine part.<br>3. Prepare the technologist to be a successful technician by learning the correct principles of the mechanical techniques specialization of the production branch. |

| **Teaching and learning methods** |
|---|
| 1. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.<br>2. Solve a set of practical and practical examples by the subject teacher.<br>3. Through discussion, students are involved by solving some practical problems.<br>4. Asking the student to visit the library and the international information network (Internet) to obtain additional knowledge of the study materials and |

to observe, maintain and repair the machines in the machinery workshop at the Institute.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teaching the student order and cleanliness
2. Teaching patience and stretching
3. Acquire the quality of good manners and good dealing with auditors

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices , to attract attention and attract students to better reach the idea to the student.
2. Giving students extracurricular assignments that require them to exert skills and self-explanations in experiential ways.
3. Interrogate the students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
4. Using brainstorming and feedback in order to activate the accumulated experiences of students by linking what has been taken from the study materials in the previous academic stages and linking them to the new.
5. Providing students with practical skills by reviewing the machines inside and outside the institute.

**Evaluation methods**

The evaluation is carried out on the basis of:

1- First semester exam (theoretical).
2- The work of the year takes into account daily tests, duties, attendance and participation.
3- Final exam (theoretical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing the skill of accuracy in measurements
2. Developing the skill of cooperation and the alternative system
3. - Enabling students to subject the technology of machine parts in its

applied and cognitive aspects.
4. - Develop the student's ability to analyze information and interpret the data obtained through calculations.
5. - Enable the student to conduct a field survey to identify and solve problems on the ground.

## 11. Course Structure

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Review of Strength of Materials. | Student comprehension of the subject | 2 hours | First |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Riveted Joints. Types of Riveted Joints, Design of Riveted Joints, Efficiency of Riveted Joints | Student comprehension of the subject | 2 hours | Second |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Third |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Welded Joints Types of welding Joints, Design of welding Joints | Student comprehension of the subject | 2 hours | Fourth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Fifth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Screwed Joints, Design of Bolts for Fastening, Design of Bolts for Power Transition | Student comprehension of the subject | 2 hours | Sixth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Seventh |
| Discussion, Quick | Theoretical | Keyed Joints, Types of Key , | Student | 2 hours | Eighth |

| | | | | | |
|---|---|---|---|---|---|
| Exam, Problem Solving, Homework | lecture and the use of the screen and the means of explanation | Design of Sunk Key | comprehension of the subject | | |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Ninth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Frictional Clutches, Type of Frictional Clutches, Design of Frictional Clutches. | Student comprehension of the subject | 2 hours | Tenth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Eleven h |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Types of Springs , Design of Springs. | Student comprehension of the subject | 2 hours | Twelft |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Thirtee nth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Types of Belts , Design of Belts | Student comprehension of the subject | 2 hours | Fourte nth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Fifteen h |

| **12. Infrastructure** | |
|---|---|
| **1. Required textbooks** | **Machinery Parts Book** |
| **2. Main references (sources)** | 3. Strength of Material by Ferdinal L . Singer<br>4. Strength of Materials by R.S.Khurmi.<br>5. Machine Design by R.S. |

| | |
|---|---|
| | Khurmi, J.K. Gupta<br>6. Machine Design by Paul H.Black .<br>Schaums Outline Series of Machine Design by Hall , Holowenko , Laughin |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of design |
| **B- Electronic references, websites ....** | Machinery Parts Website |

## Course Description Form

**Course Description:** Machine Parts Technology (2)

**The student understands the parts of the machines and how to perform the design calculations of each part when a collapse occurs due to external forces or structure through the stresses that form in that part.**

| |
|---|
| 1. Course Name: |
| Machine Part - 2 |
| 2. Course Code: |
| **METP211** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Available Attendance Forms: Attendance (2 hours theoretical - an average o hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 hours /2 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Zainab Mohammed Tahir<br>Email: mti.lec119.zainab@ntu.edu.iq |

**9. Course Objectives**

**Teaching and learning methods**

1. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.
2. Solve a set of practical and practical examples by the subject teacher.
3. Through discussion, students are involved by solving some practical problems.
4. Asking the student to visit the library and the international information network (Internet) to obtain additional knowledge of the study materials and to observe, maintain and repair the machines in the machinery workshop at the Institute.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teaching the student order and cleanliness
2. Teaching patience and stretching
3. Acquire the quality of good manners and good dealing with auditors

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices, to attract attention and attract students to better reach the idea to the student.
2. Giving students extracurricular assignments that require them to exert skills and self-explanations in experiential ways.
3. Interrogate the students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
4. Using brainstorming and feedback in order to activate the accumulated experiences of students by linking what has been taken from the study materials in the previous academic stages and linking them to the new.
5. Providing students with practical skills by reviewing the machines inside and outside the institute.

**Evaluation methods**

The evaluation is carried out on the basis of:

1- First semester exam (theoretical).

2- The work of the year takes into account daily tests, duties, attendance and participation.

3- Final exam (theoretical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing the skill of accuracy in measurements
2. Developing the skill of cooperation and the alternative system
3. - Enabling students to subject the technology of machine parts in its applied and cognitive aspects.
4. - Develop the student's ability to analyze information and interpret the data obtained through calculations.
5. - Enable the student to conduct a field survey to identify and solve problems on the ground.

## 12. Course Structure

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The we |
|---|---|---|---|---|---|
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Design of Shafts. | Student comprehension of the subject | 2 hours | Firs |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Sec nd |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Design of Journal Bearings. | Student comprehension of the subject | 2 hours | Thi d |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Fou th |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Selection of Ball Bearings. | Student comprehension of the subject | 2 hours | Fift |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Design of Gears by Lewis Equation. | Student comprehension of the subject | 2 hours | Sixt |

| | | | | | |
|---|---|---|---|---|---|
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Seventh |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Gears Trains. | Student comprehension of the subject | 2 hours | Eighth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Ninth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Design of Simple Gears Box. | Student comprehension of the subject | 2 hours | Tenth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Eleventh |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Worm Gears. | Student comprehension of the subject | 2 hours | Twelfth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Thirteenth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | Cams. | Student comprehension of the subject | 2 hours | Fourteenth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Fifteenth |

## 12. Infrastructure

| | |
|---|---|
| **1. Required textbooks** | **Machinery Parts Book** |

| | |
|---|---|
| **2. Main references (sources)** | 1. Machine Design by R.S. Khurmi, J.K. Gupta<br>2. Machine Design by Paul H.Black .<br>Schaums Outline Series of Machine Design by Hall , Holowenko , Laughin |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of design |
| | Websites for machine parts and machine parts design. |

## Course Description: Industrial Drawing 1

**The student studies the foundations of industrial drawing 1 (Machine Drawing1) and is sometimes called mechanical drawing or machine drawing but it is an artistic, engineering and industrial language. Like any language, it is used to understand and transfer industrial and engineering ideas between people, whether it is through writing (preparing drawings) or by reading (studying previously prepared drawings).**

| |
|---|
| 1. Course Name: |
| Machine Drawing 1 |
| 2. Course Code: |
| **METP220** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (hours of work - an average of hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 45 hours /3 |

| 7. Course administrator's name (mention all, if more than one name) |
|---|
| Name: Hasan Mahmood kaedhi<br>Email: hasankaedhi@ntu.edu.iq |

| **9. Course Objectives** |
|---|
| Upon completion of this training module, the trainee has:<br><br>1- Active/Review the necessary basics of the engineering drawing language.<br>2- Normative systems regulating engineering and technical drawing operations.<br>3- Types of drawing lines. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br>1. The student is introduced to the basic concepts of industrial drawing.<br>2. Expanding students' perceptions, enhancing their concept, and linking industrial drawing with mechanical machines.<br>3. The student's knowledge of how to draw and use the computer |
| **B - Skills objectives of the course.**<br>2. A detailed study of industrial drawing.<br>1. A detailed study of the AutoCAD program and how to harness the program in integrating fees.<br>2. Prepare students to be technicians with experience in industrial drawing, how to analyze drawings, relate them to mechanical machines, and how to operate them. |
| **Teaching and learning methods**<br>5. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.<br>1. Solve a set of practical and practical examples by the subject teacher.<br>2. Asking the student to solve arithmetic problems and solve in different ways to gain skill in the methods of learning industrial drawing.<br>3. Require the student to bring reports for each painting drawn in the lab. |
| **Evaluation methods** |
| 4. Daily interaction and topic preparation.<br>1. Daily and weekly tests.<br>2. Quarterly and final exams. |
| **C. Emotional and value goals**<br>1. Teach the student order and hygiene.<br>2. Teaching patience and prolongation.<br>3. Acquire the quality of good character and good dealing with auditors. |

| **Teaching and learning methods** |
|---|
| 4. Using modern means in presenting the scientific and theoretical side, such as Data Show devices, to attract attention and attract students to better reach the idea to the student.<br>1. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.<br>2. Providing students with practical skills by conducting experiments on electrical appliances inside the laboratory and viewing electrical equipment outside it. |
| **Evaluation methods** |
| The evaluation is carried out on the basis of:<br>1. Semester exam (theoretical + practical).<br>2. The work of the year takes into account daily tests, assignments, attendance and reports on experiments.<br>3. Final exam (theoretical + practical). |
| **d. General and transferable qualification skills (other skills related to employability and personal development).**<br>1. Developing the skill of accuracy in industrial drawing.<br>2. Enabling students to master industrial drawing theoretically, arithmetically and practically.<br>3. Develop the student's ability to analyze information and interpret the data obtained by conducting practical industrial drawing calculations and calculating them theoretically as well. |

**15. Course structure (theoretical + practical)**

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | Fastening and fastening methods<br><br>Learn about the use of tables and extract measurements for the spiral<br>Drawing bolts and nuts of several types | Student comprehension of the experience | 3 hours | First |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 3 hours | Second |
| Explanation of | Practical | | Student | 3 hours | Third |

| | | | | | |
|---|---|---|---|---|---|
| the topic, discussion, practical experience | experience and use of the screen and explanation | | comprehension of the experience | | |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | Explanation and drawing of the Khabur | Student comprehension of the experience | 3 hours | Fourth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 3 hours | Fifth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | Explanation and drawing of the disc | Student comprehension of the experience | 3 hours | Sixth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | Explanation and drawing of the Manchurian Khabur | Student comprehension of the experience | 3 hours | Seventh |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 3 hours | Eighth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | Explanation and drawing of rivets and connecting boards | Student comprehension of the experience | 3 hours | Ninth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 3 hours | Tenth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | Weld fastening Permanent bonding | Student comprehension of the experience | 3 hours | Eleventh |
| Explanation of | Practical experience and | | Student comprehension of | 3 hours | Twelfth |

| | | | | | |
|---|---|---|---|---|---|
| the topic, discussion, practical experience | use of the screen and explanation | | the experience | | |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 3 hours | Thirteenth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | How to use welding codes | Student comprehension of the experience | 3 hours | Fourteenth |
| Explanation of the topic, discussion, practical experience | Practical experience and use of the screen and explanation | | Student comprehension of the experience | 3 hours | Fifteenth |

| **12. Infrastructure** | |
|---|---|
| **1. Required textbooks** | **1- "Fundamental of engineering drawing", Feench and Vierck.2- "Engineering drawing", S. Bogolyubove N. Voinov3- "Basic Technical drawing", Spencer** |
| **2. Main references (sources) Arabic** | **1- Engineering Drawing", Abdul Rasoul Al-Khafaf**<br><br>**2-Engineering Drawing Technology", Fapert & Vander** |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of design |
| **B- Electronic references, websites ....** | Industrial drawing website |

## Course Description Form

## Course Description: Industrial Drawing 2

**The student studies the foundations of industrial drawing 2 (Machine Drawing2) and is sometimes called mechanical drawing or machine drawing but it is an artistic, engineering and industrial language. Like any language, it is used to understand and transfer industrial and engineering ideas between people, whether it is by writing (preparing drawings) or by reading (studying drawings that have already been prepared).**

| |
|---|
| 1. Course Name: |
| Machine Drawing 2 |
| 2. Course Code: |
| **METP220** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (hours of work - an average of hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 45 hours /3 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Hasan Mahmood kaedhi<br>Email: hasankaedhi@ntu.edu.iq |

| |
|---|
| **9. Course Objectives** |
| Upon completion of this training module, the trainee has:<br><br>1- Active/Review the necessary basics of the engineering drawing language.<br>2- Normative systems regulating engineering and technical drawing operations.<br>3- Types of drawing lines. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br>1. The student is introduced to the basic concepts of industrial drawing.<br>2. Expanding students' perceptions, enhancing their concept, and linking industrial drawing with mechanical machines.<br>3. The student's knowledge of how to draw and use the computer |

**B - Skills objectives of the course.**

1. A detailed study of industrial drawing.
2. A detailed study of the AutoCAD program and how to harness the program in integrating fees.
3. Prepare students to be technicians with experience in industrial drawing, how to analyze drawings, relate them to mechanical machines, and how to operate them.

**Teaching and learning methods**

1. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.
2. Solve a set of practical and practical examples by the subject teacher.
3. Asking the student to solve arithmetic problems and solve in different ways to gain skill in the methods of learning industrial drawing.
4. Require the student to bring reports for each painting drawn in the lab.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teach the student order and hygiene.
2. Teaching patience and prolongation.
3. Acquire the quality of good character and good dealing with auditors.

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices , to attract attention and attract students to better reach the idea to the student.
2. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
3. Providing students with practical skills by conducting experiments on electrical appliances inside the laboratory and viewing electrical equipment outside it.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. Semester exam (theoretical + practical).
2. The work of the year takes into account daily tests, assignments, attendance and reports on experiments.
3. Final exam (theoretical + practical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing the skill of accuracy in industrial drawing.

2. Enabling students to master industrial drawing theoretically, arithmetically and practically.
3. Develop the student's ability to analyze information and interpret the data obtained by conducting practical industrial drawing calculations and calculating them theoretically as well.

**16. Course structure (theoretical + practical)**

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Welding linkage, welding symbols, drawing an assembly board with welding symbols | Student comprehension of the subject | 3 hours | First |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 3 hours | Second |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Column connections (couplings) types, drawing an applied painting | Student comprehension of the subject | 3 hours | Third |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Clutches, types and uses, with an assembly board | Student comprehension of the subject | 3 hours | Fourth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Pulleys and belts, types and uses, with drawing two plates to assemble parts containing belt | Student comprehension of the subject | 3 hours | Fifth |

| | | | | | |
|---|---|---|---|---|---|
| | | wheels of various types | | | |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Loading chairs, assembly plate drawing for frictional loading chair | Student comprehension of the subject | 3 hours | Sixth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Drawing of an applied plate for splitting and assembling the exhaust valve | Student comprehension of the subject | 3 hours | Seventh |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Gears types, neutrophil gears basic definitions, drawing gear justice with assembly plate for engaging gear justice | Student comprehension of the subject | 3 hours | Eighth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 3 hours | Ninth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Cone gears, drawing an assembly plate for engaging the bevel gear | Student comprehension of the subject | 3 hours | Tenth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 3 hours | Eleventh |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Introduction to Autodesk Adventure | Student comprehension of the subject | 3 hours | Twelfth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Two-dimensional drawing environment, assembly environment | Student comprehension of the subject | 3 hours | Thirteenth |
| Explanation of the topic, discussion, | Theoretical lecture and the use of the screen and the | Dynamic analysis and motion | Student comprehension of the subject | 3 hours | Fourteenth |

| | | | | | |
|---|---|---|---|---|---|
| solving problems | means of explanation | environment | | | |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the means of explanation | Additions to fees | Student comprehension of the subject | 3 hours | Fifteen |

| **12. Infrastructure** | |
|---|---|
| **1. Required textbooks** | **1- "Fundamental of engineering drawing", Feench and Vierck.2- "Engineering drawing", S. Bogolyubove N. Voinov3- "Basic Technical drawing", Spencer** |
| **2. Main references (sources) Arabic** | **1- Engineering Drawing", Abdul Rasoul Al-Khafaf**<br><br>**2-Engineering Drawing Technology", Fapert & Vander** |
| **A-Recommended books and references (scientific journals, reports ,....)** | All sober scientific journals that have to do with the broad concept of design |
| **B- Electronic references, websites ....** | Industrial drawing website |

## Course Description Form

## Course Description: Manufacturing Processes 1

**This course description provides a brief summary that inspired the course characteristics and learning outcomes expected of the student to achieve proving whether he or she made the most of the available learning opportunities. And it must be linked to the program description**

| 21.Course Name: |
|---|
| Mechanical Techniques |
| 22.Course Code: |
| **MET122** |
| 23.Semester / Year: |
| 1st. and 2nd. Semester/ 2024-2025 |
| 24.Description Preparation Date: |
| 01-06-2025 |
| 25.Available Attendance Forms: |
| 1- The weekly lesson schedule (theoretical and practical) is mandatory.<br>2- Discussions, academic sessions, other extracurricular activities, and academic conferences. |
| 26.Number of Credit Hours (Total) / Number of Units (Total) |
| 60 hours/ 60 units |
| 27. Course administrator's name (mention all, if more than one name) |
| Name: Mohameed Taki Elyas<br>Email: Mohamed.15arafat@ntu.edu.iq |
| 28.Course Objectives |

| | |
|---|---|
| **Course Objectives** | • .....<br>• .....<br>• ..... |

| 9. Teaching and Learning Strategies |
|---|
| Learning and Teaching Strategy<br>1. Providing students with the basics and topics related to the learning outcomes prior to the skills needed to solve practical problems through lectures or presentations.<br>2. Solving a set of practical and applied examples by the course instructor.<br>3. Asking students to research some of the course vocabulary and how to utilize it in engineering fields.<br>4. Asking students to work in a group to prepare reports and research in areas related to the course.<br>5. Using modern means to present scientific and theoretical aspects, such as projectors, to attract attention and engage students, thus better conveying ideas.<br>6. Questioning students through discussion groups by posing thought-provoking questions (how, why, when, where, and which) on specific topics.<br>7. Using modern teaching methods, such as animation films and videos of practical experiments. |
| 10. Expected Program Learning Outcomes |
| Knowledge:<br>A1 - The ability to analyze operations into operating elements.<br>A2 - Develop a technological path between production units. |

| |
|---|
| A3 - Prepare operating cards and orders for each unit and machine, and calculate operating time elements and loading programs for the units.<br>A4 - Determine quality control elements.<br>A5 - Conduct preliminary calculations of operating costs. |
| Skills:<br>B2 - The student must be able to identify the type of operation for which measuring devices and other operations are used.<br>B3 - The student must be able to identify the necessary part variables for operation.<br>B4 - The student must be able to calculate operating time for punching, milling, and various pattern preparation operations.<br>B5 - The student must be able to design an operating card for each operation and each part being operated. |
| Values:<br>A1- The student must be able to use all measuring tools.<br>A2- The student must be able to read all readings and units of measurement.<br>A3- The student must be able to identify all types of sand used in the plumbing process.<br>A4- The student must be able to identify all types of plumbing molds.<br>A5- The student must be able to perform plumbing operations. |

| 11. Course Structure | | | | | |
|---|---|---|---|---|---|
| **Week** | **Hours** | **Required Learning Outcomes** | **Unit or subject name** | **Learning method** | **Evaluation method** |
| 1 | 4 | Understanding the topic | Definition of measurement and units of measurement, error and its causes, methods of measuring basic dimensions, simple | Using the screen, board And Explanation | Discussion, quiz, problem solving, homework |

| | | | | | |
|---|---|---|---|---|---|
| | | | measuring devices. | media | |
| 2 | 4 | Understanding the topic | Verniers, their parts, uses, and how the micrometer works. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 3 | 4 | Understanding the topic | Measuring templates and their uses, their types, and how to use them. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 4 | 4 | Understanding the topic | Measuring angles and profiles, angle measuring tools, measuring rods (hyphens), their types | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 5 | 4 | Understanding the topic | Measuring angles and profiles, angle measuring tools, measuring rods (calipers), their types. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 6 | 4 | Understanding the topic | Measuring screw elements, external and internal diameters, step measurement, and step diameter, electronic mechanical comparators. | Using the screen, board And Explanati7media | Discussion, quiz, problem solving, homework |
| 7 | 4 | Understanding the topic | The optical device, some modern measuring methods (acoustic frequency measuring devices, digital optical). | Us8ing the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 8 | 4 | Understanding the topic | Filing and its role in industrial development, the stenography process, the tools used and the processes involved in the filing process, the files used and their specifications, machines, their types, and methods for attaching workpieces to them, uses of files, and how to clean files. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |

| | | | | | |
|---|---|---|---|---|---|
| 9 | 4 | | Saw cutting, conditions required for sawing, saw blades, screeding and their types, chisels, how to sharpen and maintain them, types of hand hammer heads and how to secure them. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 10 | 4 | | Drilling and milling, types of drills, types of primers, types of reamer, how to perform drilling and milling. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 11 | 4 | | Models, their types, woods used in their manufacture, conditions required for the model. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 12 | 4 | | Tools and equipment used in model making, molds for basins, and how to design a simple model. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 13 | 4 | | Founding, a historical overview, main methods of casting (casting, sand casting, metal mold casting, other casting methods), advantages of the casting process. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 14 | 4 | | Sand casting, casting sand, its specifications, components, casting sand, the equipment used, and additives to casting sand. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |
| 15 | 4 | | Sand casting, casting sand, its specifications, components, casting sand, the equipment used, and additives to casting sand. | Using the screen, board And Explanation media | Discussion, quiz, problem solving, homework |

| 12. Infrastructure | |
|---|---|
| 1- Dr. Qahtan Khalaf Al-Khazraji, Dr. Adel Mahmoud Hassan, "Principles of Production Processes", Second Edition, University of Baghdad, Higher Education Press, 1987. | **1 Required textbooks** |
| 1- E.P.DeGarmo, J.T. Black, and R.A. kohser " Materials and processes in Manufacturing " , Eighth Edition , John Wiley & Sons , 1999 .<br><br>2- Lawrence E. Doyle, Carl A. keyser, James L. Leach, George F. Schrader, and Morse B. Singer " Manufacturing processes and Materials for Engineering " , Third Edition, prentice - Hall, Inc. 1985 .<br>3- Sherif D.Elwakil " Processes and Design Manufacturing " , Second Edition , PWS Publishing Company , 1998 . | **2 Main references (sources)** |
| All sober scientific journals related to metal manufacturing processes. | **Recommended books and references (scientific journals, reports ,....)** |
| Websites for manufacturing processes. | **B Electronic references, websites ....** |

## Course Description Form

## Course Description: English Language2

| |
|---|
| **The student studies the basic principles of the English language in terms of** |

**using expressions that help him in daily life and how to benefit from them, in addition to the basic rules on which the English language is built in order to prevent errors during reading and writing.**

| |
|---|
| 1. Course Name: |
| English Language |
| 2. Course Code: |
| **NTU 102** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Available Attendance Forms: Attendance (2 hours theoretical - an average o hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 hours /2 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Ashraf Abdalrazaq saed<br>Email: ashraf_tech@ntu.edu.iq |

**9. Course Objectives**

1. The student should be able to recognize the English language in an advanced way and enable him to communicate in a simple way.
2. Learn about modern methods of learning English.
3. Develop the student's speaking skills through conversations between students during the lecture.
4. Develop the student's ability to understand terms and how to use them.

**10. Course Outcomes and Methods of Teaching, Learning and Assessment**

**A- Cognitive objectives**

1- Introduce the student to the basic principles of the English language.

2- Expand students' perceptions and enhance their understanding of the different words and expressions used.

3- The student knows how to read and write correctly.

**B - Skills objectives of the course.**

1. A detailed study by developing students' skills for reading, speaking and solving exercises.
2. A detailed study of how different tenses and their rules are formulated.
3. Clarify the meanings of vocabulary and how to use it according to contexts.
4. Preparing students to be able to read various texts, especially scientific ones.

**Teaching and learning methods**

1. Providing students with the basics and related topics to serve the student's scientific career through recitation, lecture or experiments.
2. Solve and illustrate examples by the subject teacher.
3. Involve the student in solving questions with questions directed by the teacher to determine the extent of the student's understanding and comprehension.
4. Give the student homework to solve, read and discuss during the next lecture.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teach the student order and hygiene.
2. Teaching patience and prolongation.
3. Acquire the quality of good manners and good dealing with others.

**Teaching and learning methods**

1. Using the data show in the presentation of the material to attract the student's attention through pictures to deliver the material better.
2. Conducting seminars by asking questions (how, what, when, where, does) for different topics.
3. Providing students with practical skills by solving various questions and providing them with the necessary skills to understand solving methods.

**Evaluation methods**

The evaluation is carried out on the basis of:

1- Semester exam (theoretical).
2- The work of the year takes into account daily tests, assignments, attendance and participation during the lecture.
3- Final exam (theoretical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing speaking skills.
2. Enabling students to master the English language.
3. Developing the student's ability to read and write by applying everything that was discussed during the lectures throughout the course.

**11. Course Structure (Theoretical)**

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Explanation of the topic, discussion, | Theoretical lecture and the use of the screen and the | General introduction to language and its basics, the use of auxiliary verbs and how to ask for a person's | Student comprehension of the subject | 2 hours | First |

| | | | | | |
|---|---|---|---|---|---|
| solving problems | white board | name | | | |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Second |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Third |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Fourth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Fifth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | The formula used during acquaintance between people and the use of the necessary vocabulary in these formulas | Student comprehension of the subject | 2 hours | Sixth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Seventh |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | Ask about objects, people, times and places using WH-questions | Student comprehension of the subject | 2 hours | Eighth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Ninth |
| Explanation of the topic, discussion, | Theoretical lecture and the use of the screen and the | Using negation and interrogative for different tenses, and answering questions in different ways | Student comprehension of the subject | 2 hours | Tenth |

| | | | | | |
|---|---|---|---|---|---|
| solving problems | white board | | | | |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Eleven h |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Twelft |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | Read texts and apply skills by answering questions and solving exercises.<br>The possessive form in the English language and how to express it, the question of time and the expressions used in it. | Student comprehension of the subject | 2 hours | Thirtee nth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Fourte nth |
| Explanation of the topic, discussion, solving problems | Theoretical lecture and the use of the screen and the white board | | Student comprehension of the subject | 2 hours | Fifteen h |

| 12. Infrastructure | |
|---|---|
| **1. Required textbooks** | Headway Book |
| **2. Main references (sources)** | Dictionary |
| **A-Recommended books and references (scientific journals, reports ,....)** | Scientific journals and books related to language and its uses |
| **B- Electronic references, websites ....** | English, conversation and grammar websites. |

# Course Description Form

## Course Description: Industrial Management

**The student understands the principles of industrial management and what are the administrative and engineering obstacles in factories and laboratories and ways to solve them.**

| 1. Course Name: |
|---|
| Industrial Management |
| 2. Course Code: |
| **MET128** |
| 3. Semester / Year: |
| **2024-2025** |
| 4. Description Preparation Date: |

| |
|---|
| 10-6-2025 |
| 5. Available Attendance Forms: |
| Attendance (2 hours theoretical - an average of 2 hours per week) |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 30 hours /2 |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Ghada Yousef Ismail<br>Email: ghadayousif1964@ntu.edu.iq |

| **9. Course Objectives** |
|---|
| 1. Clarifying the role of industrial management principles<br>2. The relationship between factories and the engineer and technician,<br>3. How to make some calculations for the design of production lines and identify all the factors affecting them. |
| **10. Course Outcomes and Methods of Teaching, Learning and Assessment** |
| **A- Cognitive objectives**<br>1. Recognize the concepts of industrial management principles<br>2. Expand students' perceptions and enhance the concept of design by giving them principles and design calculations.<br>3. Give the student experience in fees for industrial management. |
| **B - Skills objectives of the course.**<br>1. Detailed study of industrial management<br>2. Study the mathematical details that the student needs during industrial management<br>3. Prepare the technologist to be a successful technician by learning the correct principles of the mechanical techniques specialization of the production branch. |

| **Teaching and learning methods** |
|---|
| 1. Provide students with the basics and topics related to the pre-skills learning outcomes to solve practical problems through speech, lecture or experiments.<br>2. Solve a set of practical and practical examples by the subject teacher.<br>3. Through discussion, students are involved by solving some practical problems.<br>4. Asking the student to visit the library and the international information network (Internet) to obtain additional knowledge of the study materials and to observe, maintain and repair the machines in the machinery workshop at the |

Institute.

**Evaluation methods**

1. Daily interaction and topic preparation.
2. Daily and weekly tests.
3. Quarterly and final exams.

**C. Emotional and value goals**

1. Teaching the student order and cleanliness
2. Teaching patience and stretching
3. Acquire the quality of good manners and good dealing with auditors

**Teaching and learning methods**

1. Using modern means in presenting the scientific and theoretical side, such as Data Show devices, to attract attention and attract students to better reach the idea to the student.
2. Giving students extracurricular assignments that require them to exert skills and self-explanations in experiential ways.
3. Interrogate the students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics.
4. Using brainstorming and feedback in order to activate the accumulated experiences of students by linking what has been taken from the study materials in the previous academic stages and linking them to the new.
5. Providing students with practical skills by reviewing the machines inside and outside the institute.

**Evaluation methods**

The evaluation is carried out on the basis of:

1. First semester exam (theoretical).
2. The work of the year takes into account daily tests, duties, attendance and participation.
3. Final exam (theoretical).

**d. General and transferable qualification skills (other skills related to employability and personal development).**

1. Developing the skill of accuracy in measurements
2. Developing the skill of cooperation and the alternative system
3. - Enabling students to subject the technology of machine parts in its

applied and cognitive aspects.
4. - Develop the student's ability to analyze information and interpret the data obtained through calculations.
5. - Enable the student to conduct a field survey to identify and solve problems on the ground.

## 13. Course Structure

| Evaluation method | Method of education | Unit / Subject Name | Required Learning Outcomes | Hours | The week |
|---|---|---|---|---|---|
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Stages and development of management, basic principles of management, characteristics of management, levels of management.** | Student comprehension of the subject | 2 hours | First |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Administrative functions, industrial management, its functions, industrial engineering, characteristics, industrial management.** | Student comprehension of the subject | 2 hours | Second |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **- Location and arrangement of the industrial unit**<br>**- The main factors affecting the selection of industrial project sites**<br>**- arrangement of the industrial unit (preliminary arrangement of the plant).**<br>**- Classification of types of industrial unit arrangements.**<br>**- Advantages, determinants and cases in which it applies (commodity arrangement, functional, mixed, common).** | Student comprehension of the subject | 2 hours | Third |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Production planning, production planning concept, production planning and control objectives.** | Student comprehension of the subject | 2 hours | Fourth |
| Discussion, Quick | Theoretical | – **Feasibility study** | Student | 2 hours | V |

| | | | | | |
|---|---|---|---|---|---|
| Exam, Problem Solving, Homework | lecture and the use of the screen and the means of explanation | **for industrial projects:**<br>**– An idea of the feasibility study for industrial projects.**<br>**– Industrial Project**<br>**– Stages of feasibility studies**<br>**The importance of feasibility studies** | comprehension of the subject | | |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Types of production, production planning methods, linear programming methods, graphic method and transport method.** | Student comprehension of the subject | 2 hours | Sixth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Seventh |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Study of work, methods of study of work, study of method, study of time, measurement of work.** | Student comprehension of the subject | 2 hours | Eighth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Maintenance, importance of maintenance, concept of technological system** | Student comprehension of the subject | 2 hours | Ninth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Types of maintenance, types of appearances** | Student comprehension of the subject | 2 hours | X |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Costs, cost classification, wages.** | Student comprehension of the subject | 2 hours | Eleventh |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | | Student comprehension of the subject | 2 hours | Twelfth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Methods of calculating wages, incentives, types of incentives.** | Student comprehension of the subject | 2 hours | Thirteenth |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the | **Procurement management: procurement, procurement steps, types of stored materials and methods of** | Student comprehension of the subject | 2 hours | Fourteenth |

| | | | | | |
|---|---|---|---|---|---|
| | means of explanation | **controlling them.** | | | |
| Discussion, Quick Exam, Problem Solving, Homework | Theoretical lecture and the use of the screen and the means of explanation | **Industrial safety, types of accidents, roads from accidents, preventive equipment and its types.** | Student comprehension of the subject | 2 hours | Fifteenth |

| **12. Infrastructure** | |
|---|---|
| **Engineering Mechanics** Book | |
| **1. Required textbooks** | 1- Industrial Projects Management (Industrial Management) AuthorsAl , Shakarji، commendable· 1967<br>2- Ali Riad Management Information Systems Organization and Technology Riad Sultan Ali. Amman Dar, Zahran 2006 p. 2983/11/2006: Ra Descriptors: / Business Administration // Management Information |
| **2. Main references (sources)** | All sober scientific journals related to the broad concept of industrial management |
| **A-Recommended books and references (scientific journals, reports ,....)**<br>**B- Electronic references, websites ....** | Industrial Management Websites |