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. 2- Discussions, academic sessions, other extracurricular activities, and acaden 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 Email: dr.luqman@ntu.edu.iq
8. Course Objectives

Course Objectives	• ..... • ..... • .....

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

10. Expected Program Learning Outcomes
Knowledge: A1 - Identify the behavior of metals under the influence of external forces and their mechanical properties. A2 - Identify the most important tool for determining the mechanical properties of metals, namely the stress-strain curve. A3 - Identify the equipment and laboratories, how to operate them, and how to work with them. 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. B2 - Train the student on how to read and analyze curves and establish the relationship between variables. B3 - Train the student on how to prepare standard samples for each device. B4 - Train the student on how to identify and analyze defects in metals and understand their causes. Values:
Values:
C1 - The student will be able to distinguish between types of metals and determine their mechanical properties. C2 - The student will be able to operate laboratory equipment and determine standard samples for each device. C3 - The student will be able to identify defects in metals through engineering tests. 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,	Using the screen, board And Explanation media	Discussion, quiz, problem solving, homework

			thermal equilibrium diagram		
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** A. R. Bailey M.Sc., Ph.D., D.I.C., A.I.M. **Binary Alloying** A. R. Bailey M.Sc., Ph.D., D.I.C., A.I.M. **Effects of Stress on Metals** 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** 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. 2- Discussions, academic sessions, other extracurricular activities, and acaden 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 Email: dr.luqman@ntu.edu.iq

18.Course Objectives	
Course Objectives	• **.....** • **.....** • **.....**

9. Teaching and Learning Strategies
Learning and Teaching Strategy 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. 2. Solving a set of practical and applied examples by the course instructor. 3. Asking students to research some of the course vocabulary and how to utilize it in engineering fields. 4. Asking students to work in a group to prepare reports and research in areas related to the course. 5. Using modern means to present scientific and theoretical aspects, such as projectors, to attract attention and engage students, thus better conveying ideas. 6. Questioning students through discussion groups by posing thought-provoking questions (how, why, when, where, and which) on specific topics. 7. Using modern teaching methods, such as animation films and videos of practical experiments.
10. Expected Program Learning Outcomes
Knowledge: A1 - Identify binary alloy systems. A2 - Identify the microstructure and its relationship to the mechanical properties of metals and alloys. A3 - Identify the iron-carbon diagram and learn about the types of carbon steel and cast iron and their applications. A4 - Identify the heat treatment methods for carbon steel and cast iron. A5 - Identify the principles of corrosion in metals, its types, and methods of preventing it.
Skills: B1 - Train the student on how to create heat balance diagrams for binary alloy systems. B2 - Train the student on how to read heat balance diagrams and extract their microstructure. B3 - Train the student on how to link microstructure to mechanical properties through diagrams. B4 - Train the student on how to perform heat treatments on various metal alloys. 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 Email: mti.lec150.zainab@ntu.edu.iq	
8. Course Objectives	
Course Objectives	**After completing the lecture, the student will be able to:** • **Understand the zeroth law.** • **Distinguish between types of thermometers.** • **Analyze the elements of matter and their expansion.** • **Understand the types of energy, heat, and work.** • **Use the first law of thermodynamics to solve problems related to them.**
9. Teaching and Learning Strategies	
Strategy	**Knowledge** 1- The student able to define thermodynamics. 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 of 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 Abso 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 Descriptio 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	Theoretical lecture and the use of the screen the means explanation	Commentary, discussion, solving problem

			2.4 Latent Heat		
Fourth	2 hours	Student comprehension of the subject	**2.5** Energy Transfer Mechanisms: **2.6** Work and Heat in Thermodynamic Processes	Theoretical lecture and the use of the screen the means explanation	Daily exam
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. St properties- using steam table	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 . 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 Email: mti.lec150.zainab@ntu.edu.iq
8. Course Objectives

Course Objectives	he student shall be able to: 1- The turning machine is used in workshop. 2- Identify the type of operation perform on the lathe and how to implement it **3-** Identify the variables of the pa necessary for operation.

	4- The operating time of the vari turning 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	lent comprehension of the subject	Engineering tolerances, duplexities, duplex systems, tolerance ranks, duplex units, basic deviations.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Second	2 hours	lent comprehension of the subject	Types of tolerances, foundation system, column foundation syst codes of duplications, tolerances For free dimensions, detailed duplications, selection dualities and their economic advantages.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Third	2 hours	lent comprehension of the subject	Geometric tolerances in shape and position and types of shape and posi tolerances.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion

Fourth	2 hours	lent comprehension of the subject	Measurement limiters, design of measurement paramet 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 sc and the means explanation	Commentary, discussion
Fifth	2 hours	lent comprehension of the subject	Classification of metal manufacturing, metalworking , introduction to the theo of formation of reich and influencing factors, methods of fixing artifacts includ round and non-round an the conclusive limits used a Longitudinal and transve nutrition.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Sixth	2 hours	lent comprehension of the subject	Operations that can be performed on the ca lathe	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Seventh	2 hours	lent comprehension of the subject	Identify the pens used a how to fix them for artifacts, turning pens.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Eighth	2 hours	lent comprehension of the subject	Identify the types of turn pen angles, the effect of turning pen angles on th cutting process, types of turning pen metals, cutti conditions, cutting elements, uses of cutting speeds, a the use of tables And speed maps, classification of several pieces in relation to the method operation and the numbe conclusive limits.	Theoretical lecture and the use of the sc and the means explanation	Explanation of topic,discussion, solving problems
Ninth	2 hours	lent comprehension of the subject	Methods of producing lo	Theoretical lecture and the use of the sc and the means explanation	Explanation of topic,discussion, solving problems

Tenth	2 hours	lent comprehension of the subject	The cut-off limit, the emerging cutter limit and the theory of its formation, t factors that affect it, the factors that lead to its reduction in size, cooling and its importance for cutting processes, various coolin fluids.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Eleventh	2 hours	lent comprehension of the subject	How to conduct the operating card for a group of operations, calculate its elements, ar calculate the cutting time for each operation	Theoretical lecture and the use of the sc and the means explanation	Explanation of topic,discussion, solving problems
Twelfth	2 hours	lent 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 o the operated metal.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Thirteenth	2 hours	lent comprehension of the subject	Tower turning machines automatic, study of the processes that can be operated and analysis of processes the product	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Fourteenth	2 hours	lent comprehension of the subject	Operating card	Theoretical lecture and the use of the sc and the means explanation	Explanation of topic,discussion, solving problems
Fifteenth	2 hours	lent comprehension of the subject	Study how to program automatic programmed lathes and the factors affecting operating steps.	Theoretical lecture and the use of the sc and 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 par of the lathe and its work.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Second	2 hours	Student comprehension of the experience	Identify the pens used ar how to install them for artifacts.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Third	2 hours	Student comprehension of	Learn how to use tables speed maps in a lathe.	Practical experience and	Explanation of the topic,

		e experience		use of the scree and explanation	discussion, pract experience
Fourth	2 hours	Student comprehension of the experience	Turning, stolen by the drawback method.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Fifth	2 hours	Student comprehension of the experience	Turning stolen by the method of the reproducti device or the side ruler.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Sixth	2 hours	Student comprehension of the experience	Identify lathe accessorie and how to install the workpiece on them (triple sample, quadruple sample) Rotar tray, rotary switch, alley	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Seventh	2 hours	Student comprehension of the experience	Install irregular section workpieces on the rotary tray or quad tray and its axes.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Eighth	2 hours	Student comprehension of the experience	Identify the emerging cu and how to configure it during the turning proce .	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Ninth	2 hours	Student comprehension of the experience	Identify the shapes of the reich produced and their relationship to the depth the cut and other cutting conditions.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Tenth	2 hours	Student comprehension of the experience	Calculate the cutting tim on the lathe and compare with the theoretical method.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract 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 scree and explanation	Explanation of the topic, discussion, pract experience
Twelfth	2 hours	Student comprehension of the experience	Preparing a card for the sequence of operations.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Thirteenth	2 hours	Student comprehension of the experience	Programming tower lath in workshops.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Fourteenth	2 hours	Student comprehension of the experience	Perform a practical exer on the lathe	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Fifteenth	2 hours	Student comprehension of the experience	Perform another practica exercise on the lathe.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract 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)	- E.P.DeGarmo, J.T. Black, and R.A. kohser Materials and processes in Manufacturing " , Eighth Edition , John Wiley & Sons , 1999 . - 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 . 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
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. **2-** Identify the type of process performed milling, scraping and grinding machines how to implement them. **3-** Identify the variables of the p necessary for operation. **4-** The operating card is designed for e operation and for each part that is operat

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.

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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	lent comprehension of the subject	Engineering tolerances, duplexities, duplex systems, tolerance ranks, duplex units, basic deviations.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Second	2 hours	lent comprehension of the subject	Types of tolerances, foundation system, column foundation syst codes of duplications, tolerances For free dimensions, detailed duplications, selection dualities and their economic advantages.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Third	2 hours	lent comprehension of the subject	Geometric tolerances in shape and position and types of shape and posi tolerances.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Fourth	2 hours	lent comprehension of the subject	Measurement limiters, design of measurement paramet 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 sc and the means explanation	Commentary, discussion
Fifth	2 hours	lent comprehension of the subject	Classification of metal manufacturing, metalworking , introduction to the theo of formation of reich and influencing factors, methods of fixing artifacts includ round and non-round an the conclusive limits used a Longitudinal and transve nutrition.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Sixth	2 hours	lent comprehension of the subject	Operations that can be performed on the ca lathe	Theoretical lecture and the	Commentary, discussion

				use of the sc and the means explanation	
Seventh	2 hours	lent comprehension of the subject	Identify the pens used ar how to fix them for artifacts, turning pens.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Eighth	2 hours	lent comprehension of the subject	Identify the types of turn pen angles, the effect of turning pen angles on th cutting process, types of turning pen metals, cutti conditions, cutting elements, uses of cutting speeds, a the use of tables And speed maps, classification of several pieces in relation to the method operation and the numbe conclusive limits.	Theoretical lecture and the use of the sc and the means explanation	Explanation of topic,discussion, solving problems
Ninth	2 hours	lent comprehension of the subject	Methods of producing lo	Theoretical lecture and the use of the sc and the means explanation	Explanation of topic,discussion, solving problems
Tenth	2 hours	lent comprehension of the subject	The cut-off limit, the emerging cutter limit an the theory of its formation, t factors that affect it, the factors that lead to its reduction in size, cooling and its importance for cutting processes, various coolir fluids.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Eleventh	2 hours	lent comprehension of the subject	How to conduct the operating card for a group of operations, calculate its elements, ar calculate the cutting time for each operation	Theoretical lecture and the use of the sc and the means explanation	Explanation of topic,discussion, solving problems
Twelfth	2 hours	lent 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 o the operated metal.	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion

Thirteenth	2 hours	lent comprehension of the subject	Tower turning machines automatic, study of the processes that can be operated and analysis of processe the product	Theoretical lecture and the use of the sc and the means explanation	Commentary, discussion
Fourteenth	2 hours	lent comprehension of the subject	Operating card	Theoretical lecture and the use of the sc and the means explanation	Explanation of topic,discussion, solving problems
Fifteenth	2 hours	lent comprehension of the subject	Study how to program automatic programmed lathes and the factors affecting operating steps.	Theoretical lecture and the use of the sc and 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 par of the lathe and its work.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Second	2 hours	Student comprehension of the experience	Identify the pens used ar how to install them for artifacts.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Third	2 hours	Student comprehension of e experience	Learn how to use tables speed maps in a lathe.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Fourth	2 hours	Student comprehension of the experience	Turning, stolen by the drawback method.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Fifth	2 hours	Student comprehension of the experience	Turning stolen by the method of the reproducti device or the side ruler.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Sixth	2 hours	Student comprehension of the experience	Identify lathe accessorie and how to install the workpiece on them (triple sample, quadruple sample) Rotar tray, rotary switch, alley	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Seventh	2 hours	Student comprehension of the experience	Install irregular section workpieces on the rotary tray or quad tray and its axes.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Eighth	2 hours	Student comprehension of the experience	Identify the emerging cu and how to configure it during the turning proce .	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Ninth	2 hours	Student comprehension of the experience	Identify the shapes of th reich produced and their relationship to the depth	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience

			the cut and other cutting conditions.		
Tenth	2 hours	Student comprehension of the experience	Calculate the cutting tim on the lathe and compare with the theoretical method.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract 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 scree and explanation	Explanation of the topic, discussion, pract experience
Twelfth	2 hours	Student comprehension of the experience	Preparing a card for the sequence of operations.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Thirteenth	2 hours	Student comprehension of the experience	Programming tower lath in workshops.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Fourteenth	2 hours	Student comprehension of the experience	Perform a practical exer on the lathe	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract experience
Fifteenth	2 hours	Student comprehension of the experience	Perform another practica exercise on the lathe.	Practical experience and use of the scree and explanation	Explanation of the topic, discussion, pract 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)	- E.P.DeGarmo, J.T. Black, and R.A. kohser Materials and processes in Manufacturing " , Eighth Edition , John Wiley & Sons , 1999 . - 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 . 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 p 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 Email: eman.zaidan1962@ntu.edu.iq Name: hussien abdualkarem ibrahim Email: alhusaenyhusaen@ntu.edu.iq

9. Course Objectives

1. Clarifying the role of the principles of engineering mechanics
2. The relationship that binds these parts together,
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

1. Recognize the concepts of engineering mechanics.
2. Expand students' perceptions and enhance the concept of design by giving them principles and design calculations.
3. Give the student experience in fees for different machine parts.

B - Skills objectives of the course.

1. A detailed study of the engineering design of the principles of engineering mechanics

2. Study the mathematical details that the student needs during the principles of engineering mechanics
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 screen and the means of explanation	Work, Energy, Power	Student comprehension of the subject	5 hours	Sixth
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	Fourteenth
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 cantilever beam under an -axial load. Shear force (S.F.) & bending moment (B.M.) of cantilever beam under uniform distributed load.	Student comprehension of the subject	5 hours	Fifteenth

12. Infrastructure	
1. Required text books	**Engineering Mechanics** Book
2. Main references (sources)	1. Engineering Mechanics Statics and Dynamics Authors R. C. Hibbeler · 2013 2. Strength of Material by Ferdinal L . Singer 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 Email: mti.lec12.ibrahim@ntu.edu.iq Name: hussien abdualkarem ibrahim Email: alhusaenyhusaen@ntu.edu.iq

9. Course Objectives

1. Recognize the science of material properties
2. Identify engineering materials, their types and classifications
3. Learn about the atomic and crystal structure of materials,
4. recognize the magnetic and electrical properties of materials,
5. Learn about the chemical properties of substances
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

1. The student learns the engineering properties of materials and how to benefit from them in practical application.
2. Expanding students' perceptions and enhancing their concept in terms of engineering materials and their applications.
3. The student knows how to choose from several subjects according to the desired application.

Teaching and learning methods

1. Provide students with the basics and topics related to the previous learning outcomes of skills to solve practical problems through presentation or lecture.
2. Solve a set of practical and practical examples by the subject teacher.
3. Asking the student to search for the properties of new materials and how to benefit from them in engineering fields
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.
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. 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:

1. Semester exam (theoretical).
2. The work of the year takes into account daily tests, assignments, attendance and reports.
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 Test	Student comprehension of the subject	2	Ninth
		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 Email: ghadayousif1964@ntu.edu.iq

1. 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	veek
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	Student comprehension of the subject	2 hours	Ninth	

discussion, solving problems	screen and the means of explanation	maximum and minimum 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 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		Student comprehension of the experience	2 hours	Eleventh

	screen and 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 Email: mti.lec173.suhib@ntu.edu.iq

1. Course Objectives
1. Clarify the basics of electricity and electrical symbols. 2. Knowledge of connecting parts and electric motors. 3. How to perform calculations to calculate current, voltages, resistance and power. 4. Teaching students how to deal with various electrical elements and laboratory equipment correctly and according to their danger, taking into account occupational safety. 5. Developing students' skills through mental questions, answers and special tests in the laboratory and linking them theoretically with theoretical topics. 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

1- The student is introduced to the basic concepts of electricity.
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 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,	Theoretical lecture and the use of the screen and the	Alternating Current AC Current, Sine Wave and Examples	Student comprehension of the subject	1 hour	Sixth

solving problems	means of explanation				
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	Sevent
Explanation of the topic, discussion, solving problems	Theoretical lecture and the use of the screen and the means of explanation	Three Phase System 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 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	Eleven
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	Twelft
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 The Transformer, Step-Up / Step-Down Transformer, AC Machines, Three Phase Induction Motor and Examples.	Student comprehension of the subject	1 hour	Thirtee
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	Fourte
Explanation of the topic, discussion,	Theoretical lecture and the use of the screen and the		Student comprehension of the subject	1 hour	Fifteen

solving problems	means of explanation				

12. Course Structure (Practical)

Evaluation method	Method of education	Unit / Subject Name	Required Learning Outcomes	Hours	The veek
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. 2. Hughes. 3. Erick Singer.
2. Main references (sources)	1. Electrical Technology by – Theraga 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 Email: hasankaedhi@ntu.edu.iq

1. Course Objectives
Upon completion of this training module, the trainee has: 1- Active/Review the necessary basics of the engineering drawing language. 2- Normative systems regulating engineering and technical drawing operations. 3- Types of drawing lines. 4- Drawing projections of the perspective or stereoscopic shape.
10. Course Outcomes and Methods of Teaching, Learning and Assessment
A- Cognitive objectives 1. The student is introduced to the basic concepts of engineering drawing. 2. Expanding students' perceptions, enhancing their concept, and linking engineering drawing with mechanical machines. 3. The student's knowledge of how to draw and use the computer
B - Skills objectives of the course. 1. Detailed study of engineering drawing. 2. A detailed study of the AutoCAD program and how to harness the program in integrating fees. 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 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).

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	Sevent
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 .	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	Eleven
Topic Explanation, Discussion, Daily Exam Exercise Drawing	Use the screen and explanation		Student comprehension of the subject	3 hours	Twelft
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	Thirtee
Topic Explanation, Discussion, Daily Exam Exercise Drawing	Use the screen and legend		Student comprehension of the subject	3 hours	Fourte
Topic Explanation, Discussion, Daily Exam Exercise Drawing	Use the screen and legend		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. Voinov**
2. Main references (sources) Arabic	**-1 Engineering Drawing", Abdul Rasoul Al-Khafaf** **"-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 Email: Waleed.M.Najm@ntu.edu.iq Name: Abdalrahman Fathi Ahmed Email: abdalrahman.fathi@ntu.edu.iq Name: Waad Mohamed Mahmood Email: waad.m.mahmood@ntu.edu.iq

1. Course Objectives
Upon completion of this training module, the trainee has: 1- Active/Review the necessary basics of the engineering drawing language. 2- Normative systems regulating engineering and technical drawing operations. 3- Drawing projections of the perspective or stereoscopic shape.
10. Course Outcomes and Methods of Teaching, Learning and Assessment
A- Cognitive objectives . 1. Expanding students' perceptions, enhancing their concept, and linking engineering drawing with mechanical machines. 2. The student knows how to draw three-dimensional shapes
B - Skills objectives of the course. 1. Detailed study of engineering drawing. 2. A detailed study of the AutoCAD program and how to harness the program in integrating fees. 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

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	Twelft
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. Draw projections cut from a given single projection.	Student comprehension of the experience	3 hours	Fourteenth

Topic Explanation, Discussion, Daily Exam Exercise Drawing	Use the screen and explanation		Student comprehension of the experience	3 hours	Fifteen h

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** **"-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 veek
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,	Practical lecture and the use of the screen and the	Control Panel	Student comprehension of the subject	3 hours	Seventh

solving problems	means of explanation				
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	Eighth
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	Eleven
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	Twelft
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	Thirtee
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	Fourte
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	Fifteen

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 wor 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 Email: Waleed.M.Najm@ntu.edu.iq

1. 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 – Skills of use and development
3 - Thinking and analysis skills

- 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 veek
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 screen and the means of explanation	Sequel	Student comprehension of the subject	3 hours	Tenth
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	Eleventh
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	Twelfth
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	Thirteenth
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	Fourteenth
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	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

13 . Acceptance

Prerequisites	1. Classroom. 2. Laboratory. 3. Computers are laboratory. 4. Blackboard and accessories. 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 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	veek
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, solving problems	Theoretical lecture and the use of the screen and the white board	Parts of speech	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	Sevent
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	Eleven
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	Reading paragraphs (Writing laboratory reports)	Student comprehension of the subject	2 hours	Thirte nth
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	Fourte nth

Explanation of the topic, discussion, solving problems	Theoretical lecture and the use of the screen and the white board	Parts of the house and furniture	Student comprehension of the subject	2 hours	Fifteenth

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 Email: mti.lec119.zainab@ntu.edu.iq

9. Course Objectives
1. Explain the role of mechanical parts in the machine system, 2. The relationship that binds these parts together, 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 1- Recognize the basic concepts of machine parts. 2- Expand students' perceptions and enhance the concept of design by giving them principles and design calculations. 3- Give the student experience in fees for different machine parts.
B - Skills objectives of the course. 1. A detailed study of the engineering design of the machine parts. 2. Study the mathematical details that the student needs during the redesign of the machine part. 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.

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 Exam, Problem Solving, Homework	Theoretical lecture and the use of the screen and the means of explanation	Keyed Joints, Types of Key , Design of Sunk Key	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	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 4. Strength of Materials by R.S.Khurmi.

	5. Machine Design by R.S. Khurmi, J.K. Gupta 6. Machine Design by Paul H.Black . 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 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 wee
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	First
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	Seco d
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	Third
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	Fourt
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	Fifth
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	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	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 2. Machine Design by Paul H.Black . 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 Email: hasankaedhi@ntu.edu.iq

9. Course Objectives

Upon completion of this training module, the trainee has:

1- Active/Review the necessary basics of the engineering drawing language.
2- Normative systems regulating engineering and technical drawing operations.
3- Types of drawing lines.

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

A- Cognitive objectives

1. The student is introduced to the basic concepts of industrial drawing.
2. Expanding students' perceptions, enhancing their concept, and linking industrial drawing with mechanical machines.
3. The student's knowledge of how to draw and use the computer

B - Skills objectives of the course.

2. A detailed study of industrial drawing.
1. A detailed study of the AutoCAD program and how to harness the program in integrating fees.
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

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

Evaluation methods

4. Daily interaction and topic preparation.
1. Daily and weekly tests.
2. 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
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. 1. Interrogate students through panel discussions by asking thinking questions (how, why, when, where, any) for specific topics. 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: 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.

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 Learn about the use of tables and extract measurements for the spiral 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 the topic, discussion, practical experience	Practical experience and use of the screen and explanation		Student comprehension of the experience	3 hours	Third
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	Sevent
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	Eleven h

Explanation of the topic, discussion, practical experience	Practical experience and use of the screen and explanation		Student comprehension of the experience	3 hours	Twelft
Explanation of the topic, discussion, practical experience	Practical experience and use of the screen and explanation		Student comprehension of the experience	3 hours	Thirtee nth
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	Fourte nth
Explanation of the topic, discussion, practical experience	Practical experience and use of the screen and explanation		Student comprehension of the experience	3 hours	Fifteen h

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** **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 Email: hasankaedhi@ntu.edu.iq

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

Explanation of the topic, discussion, solving problems	Theoretical lecture and the use of the screen and the means of explanation	Dynamic analysis and motion environment	Student comprehension of the subject	3 hours	Fourteenth
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	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** **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. 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 Email: Mohamed.15arafat@ntu.edu.iq
28.Course Objectives

Course Objectives	• ..... • ..... • .....

9. Teaching and Learning Strategies
Learning and Teaching Strategy 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. 2. Solving a set of practical and applied examples by the course instructor. 3. Asking students to research some of the course vocabulary and how to utilize it in engineering fields. 4. Asking students to work in a group to prepare reports and research in areas related to the course. 5. Using modern means to present scientific and theoretical aspects, such as projectors, to attract attention and engage students, thus better conveying ideas. 6. Questioning students through discussion groups by posing thought-provoking questions (how, why, when, where, and which) on specific topics. 7. Using modern teaching methods, such as animation films and videos of practical experiments.
10. Expected Program Learning Outcomes

Knowledge: A1 - The ability to analyze operations into operating elements. 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. A4 - Determine quality control elements. A5 - Conduct preliminary calculations of operating costs.
Skills: B2 - The student must be able to identify the type of operation for which measuring devices and other operations are used. B3 - The student must be able to identify the necessary part variables for operation. B4 - The student must be able to calculate operating time for punching, milling, and various pattern preparation operations. B5 - The student must be able to design an operating card for each operation and each part being operated.
Values: A1- The student must be able to use all measuring tools. A2- The student must be able to read all readings and units of measurement. A3- The student must be able to identify all types of sand used in the plumbing process. A4- The student must be able to identify all types of plumbing molds. 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	Using the screen, board	Discussion, quiz, problem

			basic dimensions, simple measuring devices.	And Explanation media	solving, homework
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	Using the screen, board And Explanation media	Discussion, quiz, problem solving, homework

			workpieces to them, uses of files, and how to clean files.		
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 . 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 . 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 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, solving problems	Theoretical lecture and the use of the screen and the white board	General introduction to language and its basics, the use of auxiliary verbs and how to ask for a person's name	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, 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, solving problems	Theoretical lecture and the use of the screen and the white board	Using negation and interrogative for different tenses, and answering questions in different ways	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	Read texts and apply skills by answering questions and solving exercises. 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	Thirteenth
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	Fourteenth
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	Fifteenth

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 Email: ghadayousif1964@ntu.edu.iq

9. Course Objectives
1. Clarifying the role of industrial management principles 2. The relationship between factories and the engineer and technician, 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 1. Recognize the concepts of industrial management principles 2. Expand students' perceptions and enhance the concept of design by giving them principles and design calculations. 3. Give the student experience in fees for industrial management.
B - Skills objectives of the course. 1. Detailed study of industrial management 2. Study the mathematical details that the student needs during industrial management 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.

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** **- The main factors affecting the selection of industrial project sites** **- arrangement of the industrial unit (preliminary arrangement of the plant).** **- Classification of types of industrial unit arrangements.** **- 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 Exam, Problem Solving, Homework	Theoretical lecture and the use of the screen and the means of explanation	– **Feasibility study for industrial projects:** – **An idea of the feasibility study for industrial projects.** – **Industrial Project** – **Stages of feasibility studies** **The importance of feasibility studies**	Student comprehension of the subject	2 hours	V
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	Sevent
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	Eleven
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	Twelft
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	Thirtee
Discussion, Quick Exam, Problem Solving, Homework	Theoretical lecture and the use of the	**Procurement management: procurement, procurement steps, types of stored**	Student comprehension of the subject	2 hours	Fourte

	screen and the means of explanation	**materials and methods of 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 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 ,....) **B- Electronic references, websites ....**	Industrial Management Websites