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

Academic Program and Course Description Guide

2025

Introduction:

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

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

This guide, in its second version, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and changes in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, semester) system, in addition to adopting the description of the academic program circulated pursuant to the letter of the Department of Studies TM3/2906 dated 5/3/2023 regarding programs that adopt the Bologna process as the basis for their work.

In this regard, we cannot but emphasize the importance of writing a description of academic programs and courses to ensure the smooth running of the educational process.

Concepts and terminology:

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

Course Description: Provides a concise summary of the most important characteristics of the course and the learning outcomes expected from the student, demonstrating whether he has made the most of the available learning opportunities. It is derived from the program description.

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

Program Mission: It briefly explains the goals and activities required to achieve them, and it also identifies the paths and directions of the program's development.

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

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

Learning Outcomes: A compatible set of knowledge, skills and values acquired by the student after successfully completing the academic program. The learning outcomes for each course must be determined in a way that achieves the program objectives.

Teaching and Learning Strategies: The strategies used by the faculty member to develop the student's teaching and learning. They are plans that are followed to achieve the learning objectives. That is, they describe all classroom and extracurricular activities to achieve the learning outcomes of the program.

Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation
International Accreditation Dept.

Academic Program Specification Form for The Academic Year 2024-2025

University: Northern Technical University
College: Hawija Technical Institute
Dept.: Power Mechanics Techniques
Date of Form Completion :25-6-2025

Department Head Name/ Qusay Kamil Jasim
Date: 25/6/2025
Signature

Department Head Name: Dr. Mohammed Jyad
Date: 25 / 6 /2025
Signature

Quality Assurance And University Performance Manager

Data: *25 / 6 /2025*
Signature

Dean's approval

1. Program Vision

To equip students with both theoretical and practical knowledge in the field of Power Mechanics Techniques, meeting the demands of the job market and expanding the horizons of technical education by developing the curriculum

2. Program Mission

- Prepare technical of maintain and repair parts and components for cars (diesel and gasoline).

- Prepare technical of maintain and repair parts and components of electrical power production plants and systems.

- The ability to operate electric power stations and water pumping stations.

- Train students both theoretically and practically to meet job market requirements through a modern curriculum and advanced laboratory equipment.

- Stay abreast of scientific advancements in global institutes and universities.

- Adhere to the ethics of the profession, ensuring compliance with applicable standards and regulations.

- Strive for excellence in service delivery that meets quality standards.

3. Program objectives

A – Automotive Technologies Branch

This branch aims to prepare technical personnel who serve as a link between specialists and skilled workers. The branch provides graduates with both theoretical and practical knowledge, enabling them to carry out their assigned duties, which include:

- The ability to inspect, identify, and repair mechanical and electrical faults in vehicles.

- Performing routine maintenance for gasoline and diesel vehicles.

-The ability to operate and manage service and maintenance stations.

B – Power Generation Technologies Branch:

This branch aims to prepare technical personnel who serve as a link between specialists and skilled workers. It provides graduates with theoretical, practical, and scientific knowledge to enable them to carry out their assigned tasks, which include:

- Working in various types of power generation plants (steam, gas, hydroelectric, and diesel).
- Performing emergency and routine maintenance on the components and units of different stations, along with their measuring instruments.
- Working in pumping and operation stations and maintaining their various components.

4. Program accreditation

Under study

5. Other external influences

– The Iraqi market and regional markets need qualified technical personnel in fields such as operation and maintenance of power systems, as well as management of industrial workshops, cooling and air-conditioning systems, and thermal energy.

– Employers are seeking graduates with advanced practical and applied skills.

– The government's focus on alternative energy and energy conservation requires the inclusion of modern courses and technologies in the program.

– The Ministry of Higher Education's plans aim to enhance quality and program accreditation.

– Collaboration with factories, industrial plants, and the private sector provides practical training opportunities for students and enriches the academic program.

– Joint contracts and agreements with production institutions contribute to developing students' applied skills.

6. .Program structure for the first and second levels				
Program Structure	Number of courses	Study unit	Percentage	Notes *
University Requirements	11	22	26.8%	9 Basic, 2 Optional
Institute Requirements	4	9	9.8%	3 Basic, 1 Optional
Department Requirements	22	86	63.4%	22 Basic
Summer Training	Completed	-------	----------	
Other	nothing			

*Notes may include whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			Theoretical	Practical
Power Generation Branch first level/ first semester 2024–2025	NTU100	Human Rights and Democracy	2	0
	NTU101	English language	2	0
	NTU106	Franch Language	2	0
	TIH110	Mathematic 1	2	0
	TIH113	Mechanical Workshops	0	3
	MPTP122	Thermodynamics	2	2
	MPTP121	Electrical technology1	2	2
	MPTP120	Fluid	2	2
	MPTP127	Engineering Mechanics1	2	2
	MPTP125	Engineering Drawing1	0	3
Power Generation Branch first level /second semester	NTU103	Arabic language	2	0
	NTU102	Computer	1	1
	NTU104	Sport	1	1
	TIH111	Mathematic2	2	0
	TIH114	Mechanical Workshops 2	0	3
	MPTP123	Heat Transfer	2	2

2024–2025	MPTP126	Engineering Drawing	0	3
	MPTP128	Hydraulic Machines	2	2
	MPTP124	Electrical technology	2	2
	MPTP129	Engineering Mechanics2	2	2
Power Generation Branch second level / first semester 2024–2025	NTU200	English language	2	0
	NTU204	Ethics of the Profession	2	0
	NTU203	The crimes of the Baath regime in Iraq	2	0
	MPTP220	Measurement Instruments1	2	2
	MPTP221	Hydraulic & Pneumatic Systems1	2	2
	MPTP222	Gas Turbine and Diesel Power Plant Technology1	2	3
	MPTP223	Steam Power Plant Technology1	2	3
	MPTP224	Electrical Technology(1)	2	2
	MPTP225	Industrial Drawing	0	3
Power Generation Branch second second/level semester 2024–2025	NTU202	Arabic language	2	0
	NTU201	Computer	1	1
	MPTP228	Measurement Instruments2	2	2
	MPTP229	Hydraulic & Pneumatic Systems2	2	2
	MPTP230	Gas Turbine and Diesel Power Plant Technology2	2	3
	MPTP231	Steam Power Plant Technology2	2	3
	MPTP232	Electrical Technology2	2	2
	PMTA234	Graduation Project	0	3
Year/Level	Course Code	Course Name	Credit Hours	
			Theoretica 1	Practical
Automotive Technologies Branch first level/ first semester 2024–2025	NTU100	Human Rights and Democracy	2	0
	NTU101	English language	2	0
	NTU106	Franch Language	2	0
	TIH110	Mathematic 1	2	0
	TIH112	Workshops	0	3
	PMTA124	Thermodynamics	2	2
	PMTA120	Automotive Engines Maintenance1	2	4
	PMTA122	Automotive Electrics and Electronics1	2	2
	PMTA126	Engineering Mechanics	2	1
	PMTA127	Engineering Drawing1	0	3

Automotive Technologies Branch first level /second semester 2024–2025	NTU103	Arabic language	2	0
	NTU102	Computer	1	1
	NTU104	Sport	1	1
	TIH111	Mathematic2	2	0
	TIH113	Workshops 2	0	3
	PMTA125	Heat Transfer and Fluid	1	2
	PMTA121	Automotive Engines Maintenance 2	2	4
	PMTA123	Automotive Electrics and Electronics 2	2	2
	PMTA128	Engineering Drawing 2	0	3
Automotive Technologies Branch second level / first semester 2024–2025	NTU200	English language	2	0
	NTU204	Ethics of the Profession	2	0
	NTU203	The crimes of the Baath regime in Iraq	2	0
	PMTA210	Maintenance of automotive mechanical power transmission systems1	2	4
	PMTA212	Automotive electronic control systems1	2	2
	PMTA214	Internal Composition Engine1	2	2
	PMTA219	computer aided Engineering drawing for automotive parts	0	6
	PMTA217	Automotive Bodywork1	1	2
	PMTA228	Automotive Electrical and electronics1	1	2
Automotive Technologies Branch second second/level semester 2024–2025	NTU202	Arabic language	2	0
	NTU201	Computer	1	1
	PMTA224	Maintenance brake, suspension and steering systems in the Automotive2	2	4
	PMTA213	Automotive electronic control systems2	2	2
	PMTA215	Internal Composition Engine2	2	2
	PMTA223	Automotive mechanics	4	0
	PMTA218	Automotive Bodywork2	1	2
	PMTA229	Automotive Electrical and electronics2	1	2
	PMTA226	Graduation Project	0	3

8. Expected learning outcomes of the program

Knowledge(A)

1-Learn the working mechanisms of parts and components in both diesel and gasoline vehicles.

2-Knowledge how to perform periodic maintenance for devices, systems, and equipment at work sites.

3-Knowledge of the diagnosis of faults in electric power generation stations.

4-Understanding the diagnosis of faults in electric power generation stations.

5-Transferring the above-mentioned theoretical knowledge to skilled workers.

Skills(B)

1 **–**Teamwork skills.

2–Computer and Internet skills.

3–Communication skills such as English.

4–The ability to maintain and repair parts and components of vehicles (diesel and gasoline).

5 –The ability to maintain and repair parts and components of electric power generation stations and systems.

6 – The ability to operate electric power plants and water pumping stations.

Values(C)

1–The student acquires the concepts and basics of vehicles (diesel and gasoline) and electric power generation stations and systems.

2–Analyze the problems facing workers in it and how to develop the necessary solutions.

3–Evaluate the proposed solutions and choose the best of them.

4- Integrity, loyalty and dedication to work.

9. Teaching and learning methods
The instructor explains the theoretical lectures on the board, the use of a data viewer to illustrate the practical aspect, printed lectures, and instructional materials, as well as workshops, laboratories, practical training, and summer training.
10. Evaluation methods
Daily, semester and final tests, weekly reports
11. Faculty
Faculty members

Academic Rank	Specialization		Special requirements/skills (if any)		Faculty preparation	
	Year	Special			permanent	lecturer
Assistant Professor	Mechanical Engineering	Fluids - Thermals			permanent	
Lecturer	engineering automobiles techniques	operation of transport and technological machines and complexes			permanent	
Lecturer	engineering automobiles techniques	Machinery and Equipment Technology			permanent	
Lecturer	Mechanical Engineering	CA-CAM			permanent	
Assistant Lecturer	Mechanical Engineering	Energy			permanent	

Evaluation methods
Daily, semester and final tests, weekly reports

12. Acceptance Criteria

The student's acceptance criteria are determined according to the central acceptance within the ministry's plan, the student's branch in the preparatory school, his average and his desire, and this is after the student has been interviewed in a special interview at the institute.

Professional development
Orientation of new faculty members through seminars, symposia and conference attendance.
Professional development for faculty members
Through conferences, seminars, discussion groups and the attendance of faculty .members at postgraduate discussions

13. The most important sources of information about the program

1 .Methodological books prescribed by the Northern Technical University.
2 .Resources available in the Technical Institute's library.
3. Resources available on the Internet

14. Program Development Plan

1- Identifying modern scientific developments.

2- Participating in international and local conferences.

3- Participating in scientific workshops inside and outside Iraq.

4- Updating curricula to meet the demands of the job market.

5- Developing educational laboratories within the Power Mechanics Engineering Department.

6- Developing educational fields within the Power Mechanics Engineering Department.

Program Skills Outline															
Year/Level	Course Code	Course Name	Mandatory or Elective	Required Learning Outcomes of The Program											
				Knowledge				Skills				Values			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Power Generation Branch first level 2024–2025	NTU100	Human Rights and Democracy	University					✓			✓				✓
	NTU101	English language								✓					
	NTU103	Arabic language							✓						
	NTU102	Computer							✓						
	NTU104	Sport								✓					
	NTU106	Franch Language													
	TIHA110	Mathematic 1	Institute							✓					
	TIHA111	Mathematic 2								✓					
	TIH113	Mechanical Workshops				✓									
	TIH114	Mechanical Workshops 2				✓									
	MPTP122	Thermodynamics	Department	✓	✓		✓	✓			✓		✓	✓	
	MPTP121	Electrical technology1		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP120	Fluid		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP127	Engineering Mechanics1		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP125	Engineering Drawing1		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP123	Heat Transfer		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP126	Engineering Drawing		✓	✓			✓	✓			✓	✓	✓	
	MPTP128	Hydraulic Machines		✓		✓			✓			✓	✓	✓	
	MPTP124	Electrical technology		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP129	Engineering Mechanics2		✓	✓		✓	✓				✓	✓	✓	
Power Generation Branch second level	NTU200	English language	University					✓			✓				✓
	NTU204	Ethics of the Profession								✓					
	NTU203	The crimes of the Baath regime in Iraq							✓						
	NTU202	Arabic language							✓						
	NTU201	Computer								✓					

	MPTP220	Measurement Instruments1	Department	✓	✓		✓	✓				✓	✓		
	MPTP221	Hydraulic & Pneumatic Systems1		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP222	Gas Turbine and Diesel Power Plant Technology1		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP223	Steam Power Plant Technology1		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP224	Electrical Technology(1)		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP225	Industrial Drawing		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP228	Measurement Instruments2		✓	✓		✓	✓				✓	✓		
	MPTP229	Hydraulic & Pneumatic Systems2		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP230	Gas Turbine and Diesel Power Plant Technology2		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP231	Steam Power Plant Technology2		✓	✓	✓	✓	✓				✓	✓	✓	
	MPTP232	Electrical Technology2		✓	✓	✓	✓	✓				✓	✓	✓	
	PMTA234	Graduation Project		✓	✓	✓	✓	✓				✓	✓	✓	
Automotive Technologies Branch first level 2024–2025	NTU100	Human Rights and Democracy	University					✓			✓				
	NTU101	English language								✓					✓
	NTU103	Arabic language							✓						
	NTU102	Computer							✓						
	NTU104	Sport								✓					
	NTU106	Franch Language													
	TIH110	Mathematic 1	Institute							✓					
	TIH111	Mathematic2								✓					
	TIH112	Workshops				✓									
	TIH113	Workshops 2				✓									
	PMTA124	Thermodynamics	Department	✓	✓		✓					✓	✓		

	PMTA120	Automotive Engines Maintenance1		✓	✓	✓	✓					✓	✓	✓	
	PMTA122	Automotive Electrics and Electronics1		✓	✓	✓	✓					✓	✓	✓	
	PMTA126	Engineering Mechanics		✓	✓	✓	✓					✓	✓	✓	
	PMTA127	Engineering Drawing1		✓	✓	✓	✓					✓	✓	✓	
	PMTA125	Heat Transfer and Fluid		✓	✓	✓	✓					✓	✓	✓	
	PMTA121	Automotive Engines Maintenance 2		✓	✓		✓					✓	✓		
	PMTA123	Automotive Electrics and Electronics 2		✓	✓	✓	✓					✓	✓	✓	
	PMTA128	Engineering Drawing 2		✓	✓	✓	✓					✓	✓	✓	
	PMTA125	Heat Transfer and Fluid		✓	✓	✓	✓					✓	✓	✓	
	PMTA121	Automotive Engines Maintenance 2		✓	✓	✓	✓					✓	✓	✓	
	PMTA123	Automotive Electrics and Electronics 2		✓	✓	✓	✓					✓	✓	✓	
	PMTA128	Engineering Drawing 2		✓	✓		✓					✓	✓		
Automotive Technologies Branch second level	NTU200	English language	University						✓			✓			
	NTU204	Ethics of the Profession									✓				
	NTU203	The crimes of the Baath regime in Iraq								✓					
	NTU202	Arabic language								✓					
	NTU201	Computer									✓				✓
	PMTA210	Maintenance of automotive mechanical power transmission systems1	Department	✓	✓		✓					✓	✓		
	PMTA212	Automotive electronic control systems1		✓	✓	✓	✓					✓	✓	✓	

	PMTA214	Internal Composition Engine1		✓	✓	✓	✓					✓	✓	✓	
	PMTA219	computer aided Engineering drawing for automotive parts		✓	✓	✓	✓					✓	✓	✓	
	PMTA217	Automotive Bodywork1		✓	✓	✓	✓					✓	✓	✓	
	PMTA228	Automotive Electrical and electronics1		✓	✓	✓	✓					✓	✓	✓	
	PMTA224	Maintenance brake, suspension and steering systems in the Automotive2		✓	✓		✓					✓	✓		
	PMTA213	Automotive electronic control systems2		✓	✓	✓	✓					✓	✓	✓	
	PMTA215	Internal Composition Engine2		✓	✓	✓	✓					✓	✓	✓	
	PMTA223	Automotive mechanics		✓	✓	✓	✓					✓	✓	✓	
	PMTA218	Automotive Bodywork2		✓	✓	✓	✓					✓	✓	✓	
	PMTA229	Automotive Electrical and electronics2		✓	✓	✓	✓					✓	✓	✓	
	PMTA226	Graduation Project		✓	✓		✓					✓	✓	✓	

1. Course Name:
Computer
2. Course Code:
NTU102
3. Semester / Year:
first level / 2024/2025
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours /2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Abdulqader Jihad Ahmed Email: abdulqader_haw@ntu.edu.iq
8. Course Objectives
This course aims to introduce students to the basic concepts of information technology and computer use. This course includes studying computer hardware components such as the processor, memory, and input/output units, as well as software , including operating systems and various applications , as well as the concept of computer viruses and how to deal with them . **Top scorer of the University Computer Science course1**: Provide students with a comprehensive understanding of computer components and their functions. Develop students' skills in using operating systems and basic software. Knowledge of computer generations Knowledge of using software Learn how to format floppy disks Educating students about the importance of information security and data protection methods. Knowing the concept of computer viruses and how to deal with them

Know how to access the Internet

Learn about computer components

Learn about the evolution of computers throughout history

Dealing with operating systems

Gaining the skill of using the Windows operating system

Learn about software types

Identify and use storage unit types

Perform basic computer maintenance

Understanding networking basics

Application of information security principles

Gain the skill to get rid of viruses that may infect the computer

Use of office software

Searching the Internet and Using Email

Enable students to understand the basics of networking and use the Internet .effectively

9. Course Objectives

1. Course outcomes , teaching, learning and assessment methods

Course outcomes

identification: It is a set of knowledge, skills and values that the course seeks to achieve in students.

Its importance: It provides the learner with a clear idea of what he will be able to do after completing the course, and helps in designing and evaluating academic courses.

How is it determined**?** The course outcomes are determined based on the objectives of the academic program to which the course belongs.

10 . Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2 – 1	**4**	Background Information	:Introduction to computers ,their generations) componentshardware andsoftware	Theoretical + lecture practical applications	Paper test practical + test
5-4-3	6	Windows operating system	Windows operating system : the concept of theWindows system , ,its advantages, basic requirements operating the system, components of the main screen of the desktop, the concept oficons the method , of dealing withmouse activities , the importance and components of the task bar, making use ofstart to enter programs, the concept of tasks Loaded, exit the system and .turn off the calculator The concept of the window for any program and learning about its main components , dealing with Recycle bin ,my computer ,my Documents	Theoretical + lecture practical applications	Paper test practical + test
8-7-6	6	Formatting floppy disks and taking advantage of control programs	Format floppy disks, copy folders and files, make use of cut and paste and know the properties of disks, folders and files Taking advantage of the Control panel programs: such as the mouse , iconthe display icon , how to change the library desktop background, control the screen saver, change the appearance and colors of window menus, and theRemove prog icon. ,add in adding and deleting programs	Theoretical + lectur practical applications	Paper +test practical test

11-10	4	Knowledge of using the run option and some additional programs	Run Take advantage of the option to execute programs directly and learn how to get .its various methodsand help - Use entertainment programs such asMedia player Window In playing movies - Benefit from additional) programsAccessories (such asthe Calculator - drawing ,programs to create save, and retrieve drawings through the commands it .provides Dealing with the Notes window, Notepad ,Word	Theoretical + lecture practical applications	Paper test + practical test
13-12	4	Know the types of software	: Software Types of programs : System software : Software application Programming and computer programming languages:	Theoretical + lecture practical applications	Paper test + practical test
14	2	Knowledge of the Internet	Using the Internet and how to deal with it	Theoretical + lecture practical applications	Paper test + practical test
15	2	Knowledge of viruses that infect computers	The concept of computer viruses: how to become ,infected, their types, treatment and dealing with them through -antivirus programs available within the Windows operating . system environment	Theoretical + lecture practical applications	Paper test + practical test

11. **Course Development Plan**

Continuously updating the curriculum to keep pace with developments in the :labor market (Curriculum Update Committee, Scientific Committee) such as

1– Develop curricula that are compatible with the labor market

2– Holding scientific seminars and conferences aimed at updating curricula

3- Follow up on scientific developments in the field of specialization

12. Infrastructure	
Classrooms, playgrounds and workshops	**Available**
1- **Required textbooks**	**Available**
2- Main References (Sources)	The book “Computer Basics and Office -1 .Applications” by Dr. Ziad Muhammad Abboud, Dr :Ghassan Hamid Abdul Majeed and others ,This book covers the basics of computer science according to the curriculum of the Ministry of Higher Education and Scientific Research / Research and Development Department, and is a reference for first- .year students in all Iraqi universities .2 .The book "Computer Principles" by Dr :Osama Youssef Khalil ,This book covers the basics of computer hardware software, and operating systems, and is a good .reference for beginners .3 .The book "Introduction to Computers" by Dr :Muhammad Al-Saeed This book provides a detailed explanation of the computer and its components, types of software, and .networks .4 The book "Principles of Computer and Information Technology" by Dr. Hossam El-Din :Mustafa It contains a simplified explanation of the various components of the computer, along with an explanation of the programs and applications used in .it .5 The book "Computer Basics and :Applications" by Dr. Abdullah Hassan This book covers a variety of topics including computer components, operating systems, word .processing, and spreadsheets .6 The book “Introduction to Computers and : Their Applications” by Dr. Abdul Rahman Al-Shaiji The book covers the basic principles of computers in terms of hardware and software, and includes .practical applications .7 The book “Computer Principles: A :Comprehensive Guide” by a group of authors A comprehensive book that explains in detail ,everything related to computer components, software .and networks, with illustrative examples

أ) Recommended books and references (scientific (.journals, reports, etc	Hasoub Academy" : website Provides comprehensive articles and lessons on computer basics, programming, and operating systems. Learn"" website: It contains free educational courses in various computer fields, including computer basics. Rawaq"" website: It offers free courses in Arabic that include topics on computer principles and information technology. Noor Library"" website: It contains many Arabic books in the field of computers, including books on basic principles. My Educational Lessons YouTube Channel: Provides a visual explanation of computer principles and programming concepts in Arabic.
ب) ,Electronic references ..... ,websites	.1w3schools.com To learn programming languages such asHTML, CSS, JavaScript . .2geeksforgeeks.org Detailed explanation of programming concepts and .algorithms .3tutorialspoint.com , Lessons in computer, networking, cyber security .operating systems .4mozilla.org) A comprehensive reference for web developers HTML, CSS, JavaScript .(

1. Course Name:
Computer
2. Course Code:
NTU201
3. Semester / Year:
second level / 2025/2024
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours /2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Abdulqader Jihad Ahmed Email: abdulqader_haw@ntu.edu.iq
8. Course objectives (general objectives of the course)
This course aims to introduce students to the basic concepts of information technology and computer use. This course includes studying computer hardware components**such** as the processor, memory, and input/output units, as well as software, including operating systems and various applications , as well as the . concept of computer viruses and how to deal with them **Top scorer of the University Computer Science course**2 : Provide students with a comprehensive understanding of computer components and their functions. Develop students' skills in using operating systems and basic software. Knowledge of computer generations Knowledge of using software Learn how to format floppy disks

Educating students about the importance of information security and data protection methods.

Knowing the concept of computer viruses and how to deal with them

Learn about computer components

Learn about the evolution of computers throughout history

Dealing with operating systems

Gaining the skill of using the Windows operating system

Learn about software types

Identify and use storage unit types

Perform basic computer maintenance

Understanding networking basics

Application of information security principles

Gain the skill to get rid of viruses that may infect the computer

Use of office software

Searching the Internet and Using Email

9. Course Objectives

- Cognitive objectives

1- Preparing the student to familiarize himself with modern programs to keep pace with scientific development in this field

2- Instilling good morals in dealing with the electronic world and at the same time how to maintain privacy

3- Introducing the student to the Excel program and its most important components and applications

10. Course structure (Theoretical and practical vocabulary)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method
1	2	Get to know the program	Introduction to Excel 2010	+ Theoretical lecture practical lecture
2	2	Learn about menu commands	**File** menu commands	+ Theoretical lecture practical lecture
5-4-3	6	Learn about menu commands	**Home** menu commands	+ Theoretical lecture practical lecture
7-6	4	Learn about menu commands	**Insert** menu commands	+ Theoretical lecture practical lecture
9-8	4	Learn about menu commands	**layout** menu commands	+ Theoretical lecture practical lecture
10	2	Learn about menu commands	charts	+ Theoretical lecture practical lecture
12-11	4	Learn about menu commands	**Formulas** menu commands	+ Theoretical lecture practical lecture
13	2	Learn about menu commands	Data menu commands	+ Theoretical lecture practical lecture
15-14	4	Learn about menu commands	**Review and** display commands) And**view** (	+ Theoretical lecture practical lecture

11. **Course Development Plan**	
Continuously updating the curriculum to keep pace with developments in the labor market :(Curriculum Update Committee, Scientific Committee) such as **1–** Develop curricula that are compatible with the labor market **2–** Holding scientific seminars and conferences aimed at updating curricula **3–** Follow up on scientific developments in the field of specialization	
11– Infrastructure	
Classrooms, playgrounds a workshops	Available
Required textbooks	Available
Main References (Sources)	The book "Computer Basics and Office -1 ,Applications" by Dr. Ziad Muhammad Abboud :Dr. Ghassan Hamid Abdul Majeed and others ,This book covers the basics of computer science according to the curriculum of the Ministry of / Higher Education and Scientific Research Research and Development Department, and is a reference for first-year students in all Iraqi .universities .2 .The book "Computer Principles" by Dr :Osama Youssef Khalil This book covers the basics of computer hardware, software, and operating systems, and is .a good reference for beginners .3 The book "Introduction to Computers" by :Dr. Muhammad Al-Saeed

	This book provides a detailed explanation of the ,computer and its components, types of software .and networks .4 The book "Principles of Computer and Information Technology" by Dr. Hossam El-Din :Mustafa It contains a simplified explanation of the various components of the computer, along with an explanation of the programs and applications used .in it .5 The book "Computer Basics and :Applications" by Dr. Abdullah Hassan This book covers a variety of topics including computer components, operating systems, word .processing, and spreadsheets .6 The book "Introduction to Computers and Their Applications" by Dr. Abdul Rahman Al- : Shaiji The book covers the basic principles of computers in terms of hardware and software, and includes .practical applications .7 The book "Computer Principles: A :Comprehensive Guide" by a group of authors A comprehensive book that explains in detail ,everything related to computer components .software, and networks, with illustrative examples

Recommended books and references (scientific (.journals, reports, etc	Hasoub Academy" : website Provides comprehensive articles and lessons on computer basics, programming, and operating systems. Learn"" **website**: It contains free educational courses in various computer fields, including computer basics. Rawaq"" **website**: It offers free courses in Arabic that include topics on computer principles and information technology. Noor Library"" **website**: It contains many Arabic books in the field of computers, including books on basic principles. My Educational Lessons YouTube Channel: Provides a visual explanation of computer principles and programming concepts in Arabic.
,Electronic references ..... ,websites	.1**w3schools.com** To learn programming languages such as**HTML**, **CSS**, **JavaScript** . .2**geeksforgeeks.org** Detailed explanation of programming concepts .and algorithms .3**tutorialspoint.com** , Lessons in computer, networking, cyber security .operating systems .4**mozilla.org**) A comprehensive reference for web developers **HTML**, **CSS**, **JavaScript** .(

1. Course Name:

Sport

2. Course Code:

NTU104

3. Semester / Year:

first level / 2025/2024

4. Description Preparation Date:

22/6/2025

5. Available Attendance Forms:

in person

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

30 Hours /2 Units

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

Name: Jasim Ibrahim Musa
Email: jasim_hwj@ntu.edu.iq

8. Course Objectives

The goal of sports courses is to develop the individual physically psychologically, a socially through sports activities. Here are the most important general objectives of t sports course .

University Sports Course Top Scorer :

1. Developing physical fitness and general health :

Enhancing students' physical fitness levels in line with the requirements of university life and daily activities .

Contribute to the prevention of chronic diseases associated with lack of movement (such as obesity, heart disease, diabetes) .

2. Developing motor and athletic skills :

Providing students with basic and advanced skills in selected sports activities

(such as: football, basketball, volleyball, swimming, or fitness exercises) .

Developing neuromuscular coordination and various motor abilities .

3. Promoting positive values and behaviors :

Instilling the concepts of sportsmanship, commitment, discipline, and cooperation .

Building positive healthy behaviors that contribute to improving the quality of life .

4. Raising awareness of the importance of physical activity :

Enabling the student to understand the relationship between physical activity and mental and physical health .

Encouraging students to adopt an active and continuous lifestyle after university .

5. Developing psychological and social aspects :

Strengthening self-confidence, controlling emotions, and accepting loss .

Enhancing communication and teamwork skills in an educational sports environment .

6. Supporting the academic and applied aspects in related disciplines (for specialized students) :

Enabling students to understand sports rules, laws and training principles .

Preparing students for career paths in athletic training, public health, or physical educati

9. Course Objectives

identification : It is a set of knowledge, skills and values that the course and determined The course outcomes are determined based on the objectives of the academic program to which the course belongs .

1- Identify the benefits of physical activity for general health.

2- Knowing the rules and methods of different sports.

3- Understanding the concepts of physical fitness, nutrition, and safety during physical performance.

1- Performing basic motor skills (such as running, jumping, throwing).

2- Properly implementing skills related to group and individual sports.

3- Use sports equipment and tools in a correct and safe manner.

10 . Course Structure					
Chapter title	Time (theoretical / practical	Subheadings	Teaching method	Technologies used	Methods of measurement and evaluation
Introduction to Physical Education	1 hour theoretical	Definition of physical education – its objectives – its importance	Lecture + Discussion	Presentation – Smart Board	Written test – Oral participation
Health and Sports	1 hour theoretical	The importance of sports for general and mental health	Interactive lecture + discussion	PowerPoint – Video	Share – Short Quiz
Components of physical fitness	2 hours theoretical	Strength- Endurance- Speed- Flexibility- Balance	Practical explanation+ groups	Sports Equipment- Video	Note- Fitness Test
Warm–up and cool–down	2 hours theoretical	The Importance of Warm–Up – Practical Applications	Practical training + supervision	Video – Timer	My work performance evaluation
Flexibility and balance	2 hours theoretical	Flexibility exercises – dynamic and static balance	Group activity + application	Simple Tools – Video	Practical calendar
Muscular and cardiac endurance	2 hours	Endurance Tests – Progressive Exercises	Training stations	Running Track – Temporary	Running Test – Performance Monitoring
Muscle strength	theoretical	Resistance Training – Strength Basics	targeted training	Weights – Resistance bands	Recording Results – Notes

Speed and agility	2 hours	Speed Tests – Agility Exercises	Individual + group training	Cones – Timing	Timing Test – Notes
Team Games Rules	theoretical	Football – Basketball – Volleyball	Explanation + Discussion	Blackboard – Video	Theoretical Test – Participation
football skills	2 hours	Passing – Shooting – Control	Field training	Balls – Network	Practical evaluation
basketball skills	theoretical	Dribbling – Shooting – Passing	Training stations	Balls – Hoops	Individual Performance Note
volleyball skills	2 hours	Send – Pass – Smash	Pair + Group Training	Volleyball – Net	Share and rate
Practical matches	theoretical	Skills Application – Team Division	Supervised matches	Whistle – Refereeing Tools	Group evaluation
sportsmanship and ethics	2 hours	The concept of sportsmanship – ethics of play	Discussion and dialogue	Examples and scenarios	Interact and share
Final assessment	theoretical	Comprehensive Review – Practical Tests	Comprehensive testing and evaluation	Full tools	Final exam + comprehensive performance evaluation

11. **Course structure** (**Theoretical and practical vocabulary**)	
Curriculum Development Plan Continuously updating the curriculum to keep pace with developments in the labor :market (Curriculum Update Committee, Scientific Committee) such as 1. Develop curricula that are compatible with the labor market 2. Holding scientific seminars and conferences aimed at updating curricula 3. Follow up on scientific developments in the field of specialization	
12. **infrastructure**	
Classrooms, playgrounds and workshops	**Available**
Required textbooks	**Available**
Main References (Sources**)**	Physical Education and Sports - Foundations and Concepts Author: Dr. Nabil Awadallah, Dr. Khalil Balasma Edition: Third Edition, 2018 publisher : Arab Thought House, Cairo
Recommended books and ,references (scientific journals (.reports, etc	Physical Education and Sports - Foundations and Concepts Author: Dr. Nabil Awadallah, Dr. Khalil Balasma Edition: Third Edition, 2018 publisher: Arab Thought House, Cairo
Electronic references, websites	https://sdl.edu.sa > A major source of books, research and academic journals in Arabic and English, Available to Saudi university students via unified access

1. Course Name:
Mathematic 2
2. Course Code:
TIHA111
3. Semester / Year:
first level / 2025/2024
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours /2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Firas Hussein Merie Email: firas.alobeide55@gmail.com
8. Course Objectives
Providing learners with basic mathematical knowledge and skills that enhance logical and analytical thinking, enable them to solve problems systematically, and apply mathematical concepts to real-life and academic situations, while .developing academic values such as discipline, precision, and teamwork : University Sports Course Top Scorer • Gain the mathematical knowledge necessary for the prescribed topics .and understand the meanings behind each mathematical concept • Develop an understanding of the nature of the foundations of mathematics as an integrated system of fundamental mathematical concepts, which will provide a significant basis for understanding .other mathematical disciplines • The learner should be able to know the methods of solving .equations • .The learner will be able to solve partial differential equations

- The student should be able to calculate the area and volume of .objects
- .The learner will be able to solve all differential and integral problems

9. Course Objectives

Course outcomes.

identification : It is a set of knowledge, skills and values that the course seeks to achieve in students .

Its importance : It provides the learner with a clear idea of what he will be able to do after completing the course, and helps in designing and evaluating academic courses .

How is it determined ? The course outcomes are determined based on the objectives of the academic program to which the course belongs .

10. Course structure (Theoretical and practical vocabulary)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method
3-2-1	6	Integration (indefinite integration) ,of algebraic, exponential logarithmic, and trigonometric functions	integration	Theoretical lecture
6-5-4	6	Integration methods (partition (method, partial fraction method	Integration methods	Theoretical lecture
9-8-7	6	Definite integration, applications on definite integration, the area between a function curve and the axis, and the area between two curves	Integration applications	Theoretical lecture
11-10	4	,Differential equations (first order (first order, discrete	differential equations	Theoretical lecture

13-12	4	,Statistics, statistical operations ,frequency distributions, histogram ,frequency curve, arithmetic mean geometric mean	Statistics	Theoretical lecture
15-14	4	Complex numbers	Complex numbers	Theoretical lecture

11. **Course structure** (**Theoretical and practical vocabulary**)

Curriculum Development Plan

Continuously updating the curriculum to keep pace with developments in the labor market (Curriculum Update Committee, Scientific Committee) such as:

1- Course analysis and needs identification (review of current learning outcomes)

2- Updating scientific content and diversifying teaching and learning methods

3- Follow up on scientific developments and improve evaluation methods .

12. **infrastructure**

Required textbooks	Available
Main References (Sources)	Available
Recommended books and references (scientific journals, reports, etc.)	Thomas Calculus 12th edition George B. Thomas./Maurice D. Weir./Joel R. Hass .
Recommended books and references (scientific journals, reports, etc.)	Journal of the American Mathematical Society (JAMS) Mathematics for Science and Engineering - Author: Dr. Adnan Yousef Al-Atoum Real Analysis - Dr. Abdul Karim Adwan Introduction to Linear Algebra - Dr. Mohamed Rizk Basics of Statistics - Dr. Mohamed Fathy
Electronic references, websites	Khan Academy – Free Interactive Lessons Coursera – Mathematics courses from prestigious universities edX – Massive Open Courses Project Euclid – Access to mathematics and statistics research ArXiv – Archive of Recent Research in Mathematics

1. Course Name:
Arabic Language
2. Course Code:
NTU103
3. Semester / Year:
first level / 2024/2025
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours /2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed yasin huseen Email: mohammedyaseen_hwj@ntu.edu.iq
8. Course Objectives
This course aims to develop students' language skills in understanding, expression, and writing in Mod Standard Arabic, enabling them to use the language correctly in academic and professional contexts, wit focus on written and oral communication skills in the workplace.
9. Course Outcomes, Teaching and Learning Methods, and Assessment
Defines the basic rules of the Arabic language (grammar, morphology, spelling). Distinguish between types of texts and linguistic structures. Defines correct styles in formal writing. Writes grammatically and spelling correctly. Writes professional letters and reports in correct language. He speaks Modern Standard Arabic in formal situations.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Week**
1	2	introduction	Introduction to linguistic errors - the ,'marfu' ta', the long 'and the open ta	Theoretical lecture	Paper test + repo
2	2	General rules	Rules for writing extended and short al solar and lunar letters	Theoretical lecture	Paper test + repo
3	2	filling	Dhaad and Dhaa	Theoretical lecture	Paper test + repo
4	2	filling	Writing the hamza	Theoretical lecture	Paper test + repo
5	2	filling	punctuation marks	Theoretical lecture	Paper test + repo
6	2	Principles of grammar	,The noun, the verb and the difference between them	Theoretical lecture	Paper test + repo
7	2	rules	Effects	Theoretical lecture	Paper test + repo
8	2	rules	The number	Theoretical lecture	+ Paper test report
10-9	4	rules	Applications of common linguistic errors	Theoretical lecture	+ Paper test report
11	2	rules	Noun and - Tanween meanings of prepositions	Theoretical lecture	+ Paper test report

12	2	Addresses	Formal aspects of administrative discourse	Theoretical lecture	+ Paper test report
-13 14	4	Addresses	The language of administrative discourse	Theoretical lecture	+ Paper test report
15	2	Correspondence	Examples of administrative correspondence	Theoretical lecture	+ Paper test report

11. Course Development Plan

Communicate effectively in Arabic for daily interactions.

Read and understand simple to complex Arabic texts.

Write clear sentences and paragraphs in Arabic.

Demonstrate understanding of Arabic grammar, vocabulary, and pronunciation.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of Arabic grammar
Main references (sources)	Collector of Arabic lessons
Recommended books and references (scientific journals, reports...)	Arab Language Magazine
Electronic References, Websites	https://brill.com/view/journals/mrkz/mrkz-overview.xml

1. Course Name:
Engineering drawing 2
2. Course Code:
PMTA128
3. Semester / Year:
first level / 2024/2025
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
45 Hours /3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Noah mohammed saleh Email: noah_hwj@ntu.edu.iq
8. Course Objectives
Apply advanced principles of orthographic projection to represent complex three-dimensional obj accurately in two dimensions. Interpret and create sectional views, auxiliary views, and detailed drawings to clearly convey the sha size, and features of engineering components. Develop and understand assembly drawings by representing multiple parts in a single drawing identifying the relationships between components. Prepare complete engineering drawings including part, assembly, and exploded views suitable fabrication and documentation. Understand standard practices and conventions used in engineering communication, including t blocks, scales, and drawing layouts. Integrate design intent with technical communication, ensuring drawings can be effectively used manufacturing, quality control, and assembly processes.

9. Course Outcomes, Teaching and Learning Methods, and Assessment

Create and interpret detailed technical drawings for real engineering applications.
Use CAD tools effectively for 2D drafting and 3D modeling.
Apply dimensioning, tolerancing, and standards correctly.
Communicate design intent clearly through accurate, standardized drawings.
Interpret and construct advanced orthographic, sectional, and auxiliary views of complex engineering objects.
Apply appropriate dimensioning, tolerancing, and geometric standards to engineering drawings according to international conventions .
Apply drawing standards, symbols, and conventions to produce professional-quality engineering documentation.
Demonstrate visualization and spatial reasoning skills in converting between 2D and 3D representations of mechanical or structural components.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Week
1	3	Learn about projection theory, drawing projections from simpl perspective	Projection theor	+ Lecture laboratory	Daily exams
2	3	Drawing the three projections for a relative complex perspective	Falls	+ Lecture laboratory	Daily exams
3	3	Learn about drawing projections of complex perspectives	Projections for complex perspectives	+ Lecture laboratory	Daily exams
4	3	Perspective drawing of t three views	Geometric operations and dimensions	+ Lecture laboratory	Daily exams
5	3	Drawing perspective fro two projections and the	Inferring projecti	+ Lecture laboratory	Daily exams

		deducing the third projection			
6	3	Conclusion of the third s	Conclusion of th third site	+ Lecture laboratory	Daily exams
9-8-7	9	The theory of cutting i bodies and its importanc ,in engineering drawin	Cutting theory	+ Lecture laboratory	Daily exams
11-10	3	Drawing projections from complex perspective	Projection drawing	+ Lecture laboratory	Daily exams
13-12	6	Drawing perspective after cutting in different directions	Projection drawing	+ Lecture laboratory	Daily exams
15-14	6	Drawing a painting that includes perspective and its projections after cutting	Project drawing and cutting theory	+ Lecture laboratory	Daily exams

11. Course Development Plan

Expanding the study of the computer drawing program Auto CAD .

Keep pace with development The student is not proficient in implementing engineering drawings and extracting projections .

The student possesses the skill of drawing perspective and applying divisions .

Produce clear, accurate, and professional technical drawings.

Apply dimensioning and tolerancing standards in real design situations.

Communicate design intent effectively across technical disciplines.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Required prescribed books
Main references (sources)	Main references (sources
Recommended books and references (scientific journals, reports…)	ecommended books and references
Electronic References, Websites	(Scientific journals, reports ,…)

1. **Course Name**
Electrical technology1
2. **Course Code**
MPTP121
3. **Semester /Year**
first level / 2024/2025
4. **Description Preparation Date**
22/6/2025
5. **Available Forms of Attendance**
In-person
6. **Number of Credit Hours** (**Total**) / **Number of Units** (**Total**)
60 Hours /4 Units
7. **Name of the Rapporteur Administrator** (**name all names**, **if there is more than one**)
Name: Mohammed M Aldabbagh Email: mohammedaldabbagh@ntu.edu.iq
8. **Course Objectives**
1. Introduce the student to the concept and importance of electrical technology sciences. 2. Providing the student with basic knowledge about electrical energy. 3. Qualify the student to understand the scientific procedures used in the generation and transmission of electrical energy. 4. Developing the student's skills in using modern devices and technologies used in electricity technology.

9. Course Outcomes, Teaching, Learning and Assessment Methods

Definition: It is a set of knowledge, skills, and values that the course seeks to achieve in students.

Importance: It provides the learner with a clear idea of what they will be able to do after the course is over, and helps in the design and evaluation of courses.

How it is determined: E is determined based on the objectives of the academic program to which the course belongs.

Output	**Teaching and Learning Methods**	**Evaluation Methods**
A. Knowledge 1. Identify the basic concepts of electricity (current, voltage, resistance, power...). 2. Knowledge of simple and complex electrical circuit components. 3. Understand basic laws of electricity such as Ohm's law and Kirchhoff's law. 4. Distinguish between AC and DC.	Presentation, Explanation, Q&A, Discussion	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
B. Skills 1. Connect simple and advanced electrical circuits correctly. 2. Use measuring devices such as ammeter, voltmeter, and Avometer efficiently. 3. Read and interpret electrical diagrams and symbols. 4. Electrical Circuit Fault Analysis and Diagnosis.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

C. Values 1. Respect the rules of occupational safety and responsibility while handling electricity. 2. Promoting the spirit of cooperation and teamwork in the implementation of projects. 3. Accuracy and discipline in performing electrical tasks.	Self-paced learning Collaborative Learning Blended Learning	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

10. Course Structure (Theoretical and Practical Vocabulary)

The week	Hours	Required Learning Outcomes	Module Name / or Subject	Teaching Method	Evaluation Method
The first	4	Introduce the student to the concept and importance of the units used in electrical engineering and the electrical quantities used in the digital system.	The importance of units used in electrical engineering	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Second	4	Providing the student with basic knowledge about the energy forces (large and small), the transformation process with mathematical	Electric Power Forces	Active Learning: It involves active and interactive participation in the learning process through practical	• Assignments and Duties • Quiz • Practical Testing

		examples, the components of atoms, conductive materials, insulating materials, and examples about the basic material.		activities and applications	• Monthly test • Final Written Exam
Third	4	Providing the student with basic knowledge about the idea of Coulomb's Law and Stable Electricity	The idea of Coulomb's Law	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourth	4	Provide the student with basic knowledge about the relationship with voltage and electric charge, related to the charging of electrical energy, with mathematical examples.	Voltage	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fifth	4	Providing the student with basic knowledge about afake electrical resistance, types of	Electrical Resistance	Active Learning: It involves active and interactive participation in the learning process	• Assignments and Duties • Quiz

		resistors, calculating resistance		through practical activities and applications	• Practical Testing • Monthly test • Final Written Exam
Sixth	4	Providing the student with basic knowledge about the types of physical factors affecting the calculation of the resistance value, the effect of temperature on the resistance value, resistance, and mathematical examples.	Physical Factors Affecting the Calculation of the Resistance Value	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Seventh	4	Providing the student with basic knowledge about the importance of DC capability	DC	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eighth	4	Providing the student with basic knowledge about the importance of DC power emitter, closed circuit, circuit components	Circuit Components	Active Learning: It involves active and interactive participation in the learning process through practical	• Assignments and Duties • Quiz • Practical Testing • Monthly test

				activities and applications	• Final Written Exam
Ninth	4	Providing the student with basic knowledge about the importance of Ohm's law, DC circuits include (sequential, parallel, mixed bonding for resistance).	Ohm's Law	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Tenth	4	Providing the student with basic knowledge about the importance of circuit voltage and current division, mathematical applications and examples.	Split voltages and current	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eleventh	4	Providing the student with basic knowledge about the importance of circuit voltage and current division, mathematical applications and examples.	Split voltages and current	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Twelfth	4	Providing the student with basic knowledge about the importance of calculating energy in electrical circuits over	Electrical Circuits	Active Learning: It involves active and interactive participation in the learning process	• Assignments and Duties • Quiz • Practical Testing

		loads with mathematical examples.		through practical activities and applications	• Monthly test • Final Written Exam
Thirteenth	4	Providing the student with basic knowledge about the importance of the relationship between Ohm's law that connects electrical energy with mathematical examples	Electrical Circuits	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourteenth	4	Provide the student with basic knowledge about the importance of Joule's law, mathematical derivation, and mathematical examples	Joule's Law	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
First Laboratory	4	Provide the student with basic knowledge about the importance of defining the method of working in the laboratory and reports on how to work using devices.	Laboratory Method	Learning through hands-on activities and applications	• Practical Testing • Monthly test • Final Written Exam
Second	4	Providing the student with basic knowledge about the importance of measuring voltage	Voltage Devices	Learning through hands-on activities and applications	• Practical Testing • Monthly test

		devices, and using DC devices measurement (device meter), equipment is equipped for continuous capacity.			• Final Written Exam
Third	4	Provide the student with basic knowledge about the importance of calculating the color of resistors, the measuring device (current meter) in measuring resistors, and calculating the error rate.	Color Resistors	Learning through hands-on activities and applications	• Practical Testing • Monthly test • Final Written Exam
Fourth	4	Providing the student with basic knowledge about the importance of realizing Ohm's law in practice, describing the quality of resistance to certain conductors.	Ohm's Law in Practice	Learning through hands-on activities and applications	• Practical Testing • Monthly test • Final Written Exam
Fifth	4	Providing the student with basic knowledge about the importance of connecting resistors (sequential, parallel, addition).	Connecting Resistors	Learning through hands-on activities and applications	• Practical Testing • Monthly test • Final Written Exam
Sixth	4	Providing the student with basic knowledge about the importance of a practical realization of	Kirchhoff's First Law	Learning through hands-on activities and applications	• Practical Testing • Monthly test

		Kirchhoff's first law, the realization of Kirchhoff's second law in practice.			• Final Written Exam
Seventh	4	Providing the student with basic knowledge about the importance of achieving the resistors of delta and star circuits.	Delta and Star Circuit Resistors	Learning through hands-on activities and applications	• Practical Testing • Monthly test • Final Written Exam

11. Course Development Plan

Updating the curriculum continuously in line with the developments of the labor market (Curriculum Modernization Committee, Scientific Committee) such as

1. Developing curricula that are appropriate for the labor market
2. Holding scientific seminars and conferences aimed at updating the school curriculum
3. Follow up on scientific developments in the field of specialization

12. Infrastructure

Classrooms	Available
Required textbooks (curriculum books, if applicable)	Available
Main References (Sources)	1- Dr. P.S.BIMBHRA, Electrical machinery and Electrical technology 2- Mehta V K and Mehta Rohit , Objective Electrical Technology" .
Recommended books and references (scientific journals, reports...)	3- B L Theraja and A K Theraja ,A Textbook of Electrical Technology" .
Electronic References, Websites	

1. **Course Name**
Electrical Technology 1
2. **Course Code**
MPTP224
3. **Semester/Year**
Second level / 2024/2025
4. **Available Forms of Attendance**
In-person
5. **Number of Hours (Total) / Number of Units**
60 Hours /4 Units
6. **Date this description was prepared**
22/6/2025
7. **Name of the Course Administrator**
Name: Mohammed M Aldabbagh Email: mohammedaldabbagh@ntu.edu.iq
8. **Course Objectives (General Course Objectives)**
1.Introduce the student to the concept and importance of electrical technology sciences. 1. Providing the student with basic knowledge about electrical energy. 2. Qualify the student to understand the scientific procedures used in the generation and transmission of electrical energy. 3. Developing the student's skills in using modern devices and technologies used in electricity technology.

9. **Course Outcomes, Teaching, Learning and Assessment Methods**
Definition: It is a set of knowledge, skills, and values that the course seeks to achieve in students. Importance: It provides the learner with a clear idea of what they will be able to do after the course is over, and helps in the design and evaluation of courses. How they are determined: Course deliverables are determined based on the objectives of the academic program to which the course belongs.

Output	**Teaching and Learning Methods**	**Evaluation Methods**
A. Knowledge 1. Understand the principles of single- and three-phase AC. 2. Identify voltage and current equations: Vrms, VAV, frequency, angular velocity, etc. 3. Knowledge of the elements of electrical circuits (resistance, inductance, capacitance) and their components in AC current. 4. Familiarity with the types of electrical connections: straight connection, parallel, R-L-C.	Presentation, Explanation, Q&A, Discussion	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
B. Skills 1. Solve AC-related mathematical problems such as power and impedance calculation. 2. Drawing and analyzing the shapes of electrical waves. 3. Distinguish the components of the AC and use the appropriate laws to analyze them.	Active Learning: It involves active and interactive participation in the learning process through practical	• Assignments and Duties • Quiz • Practical Testing • Monthly test

	activities and applications.	• Final Written Exam
C. Values 1. Accuracy and discipline in calculations and circuit analysis. 2. Logical and analytical thinking in the interpretation of electrical phenomena. 3. Paying attention to electrical safety and correct connections.	Self-paced learning Collaborative Learning Blended Learning	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

10. Course Structure (Theoretical and Practical Vocabulary)

The week	Hours	Required Learning Outcomes	Module Name / or Subject	Teaching Method	Evaluation Method
The first	4	Introduce the student to the concept and importance of single-phase AC theory.	**Introduction**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Second	4	Provide the student with basic knowledge about the equation of voltage and current, Vr.m.s, Vav, Kp, Kf, angular	Voltage and current	Active Learning: It involves active and interactive participation in the learning process through	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam

		velocity (ω), cycle (T), frequency (F), sine wave shape, and mathematical examples.		practical activities and applications	
Third	4	Providing the student with basic knowledge about the relationship between frequency and speed resulting from rotation, mathematical examples, waveform representation, polar shape representation, mathematical examples.	Waveform representation	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Fourth	4	Providing the student with basic knowledge about the relationship between frequency and speed resulting from rotation, mathematical examples, waveform representation, polar shape representation, mathematical examples.	Waveform representation	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam

Fifth	4	Providing the student with basic knowledge about complex numbers, mathematical examples.	Complex numbers,	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Sixth	4	Provide the student with basic knowledge about the electrical power in alternating current, power triangle, real power (p), reactive power (Q), apparent power (S), mathematical examples.	Real Capability	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Seventh	4	Providing the student with basic knowledge about the components of AC (R, L, C).	AC Components	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Eighth	4	Providing the student with basic	AC circuits	Active Learning: It involves active	• Assignments and Duties

		knowledge about the types of AC circuits, (respectively, parallel, and plural) of (R-L-C).		and interactive participation in the learning process through practical activities and applications	• Quiz • Practical Testing • Monthly test Final Written Exam
Ninth	4	Providing the student with basic knowledge about the three-phase alternating current, the link between the star and the delta, the stellar generator connection, the delta generator link, and the common link between the delta and the star.	Three-phase AC	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Tenth	4	Providing the student with basic knowledge about the three-phase alternating current, the link between the star and the delta, the stellar generator connection, the delta generator link, and the common link	Three-phase AC	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam

		between the delta and the star.			
Eleventh	4	Providing the student with basic knowledge about the importance of magnetism and the theory of electromagnetism, the properties of magnetism, types of magnetism, the Rested effect, the types of magnetic materials, hysteresis, the base of the left hand.	Theory of Electromagnetism	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Twelfth	4	Providing the student with basic knowledge about the importance of magnetism and the theory of electromagnetism, the properties of magnetism, types of magnetism, the Rested effect, the types of magnetic materials, hysteresis,	Theory of Electromagnetism	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam

		the base of the left hand.			
Thirteenth	4	Provide the student with basic knowledge about the importance of magnetic flux (∅), magnetic flux density (B), magnetic flux correlation (θ), magnetic field strength (H), and examples in mathematics.	Magnetic Flow	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Fourteenth	4	Provide the student with basic knowledge about the importance of magnetic flux (∅), magnetic flux density (B), magnetic flux correlation (θ), magnetic field strength (H), and examples in mathematics.	Magnetic Flow	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
First Laboratory	4	Providing the student with basic knowledge about the importance of AC devices, studying all	Laboratory Method	Learning through hands-on activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test

		devices (oscilloscope, function generator, AC variables in the power supply, power meter). AC meters, their generation method, uses, sine wave, waveform frequency, cyclic time, effective value, relationship, form coefficient.			Final Written Exam
Second	4	Providing the student with basic knowledge about the importance of AC devices, studying all devices (oscilloscope, function generator, AC variables in the power supply, power meter). AC meters, their generation method, uses, sine wave, waveform frequency, cyclic time, effective value, relationship, form coefficient.	Study all devices	Learning through hands-on activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Third	4	Providing the student with basic	Single-phase AC circuits	Learning through hands-	• Assignments and Duties

		knowledge about the importance of single-phase AC circuits, current direction and voltage diagram. a) – Pure Resistance (R) b) - Pure Induction (L) c) – Pure Capacitive (C)		on activities and applications	• Quiz • Practical Testing • Monthly test Final Written Exam
Fourth	4	Providing the student with basic knowledge about the importance of AC circuits containing (R-L), (R-C), (R-L-C) respectively, and (R-L), (R-C), and (R-L-C) in parallel.	AC circuits	Learning through hands-on activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Fifth	4	Providing the student with basic knowledge about the importance of power calculation in a single-phase system, effective power, apparent power, reactive power,	Capacity Calculation	Learning through hands-on activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam

		power factor, and how to correct power factor in power plants.			
Sixth	4	Providing the student with basic knowledge about the importance of measuring capacitance in a three-state source (AC) a) Respectively capacitive b) Parallel capacitance c) Capacitive capacity in the complex	Measuring Capacitance	Learning through hands-on activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam
Seventh	4	Providing the student with basic knowledge about the importance of measuring capacitance in a three-state source (AC) a) Respectively capacitive b) Parallel capacitance	Measuring Capacitance	Learning through hands-on activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test Final Written Exam

		c) Capacitive capacity in the complex			

11. Course Development Plan

Updating the curriculum continuously in line with the developments of the labor market (Curriculum Modernization Committee, Scientific Committee) such as

1. Developing curricula that are appropriate for the labor market
2. Holding scientific seminars and conferences aimed at updating the school curriculum
3. Follow up on scientific developments in the field of specialization

12. Infrastructure

Classrooms	Available
Required textbooks (curriculum books, if applicable)	Available
Main References (Sources)	1- "Electrical Engineering Fundamentals" by Vincent Del Toro 2- "Electrical and Electronics Engineering for Scientists" by K A Krishnamurthy and M R Raghuveer.
Recommended books and references (scientific journals, reports, ...)	3- "Fundamentals of Electrical Engineering" by Rajendra Prasad. 4- "Basic Electrical and Electronics Engineering" by Bhattacharya.
Electronic References, Websites, ...	

1. Course Name

Engineering Mechanics

2. Course Code

PMTA126

3. Semester /Year

first level / 2024/2025

4. Description Preparation Date

22/6/2025

5. Available Forms of Attendance

In-person

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

45 Hours /3 Units

7. Name of the Rapporteur Administrator (name all names, if there is more than one)

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8. Course Objectives

- Introduce the student to the basic concepts of engineering mechanics (statics and dynamics).
- Providing the student with the basic knowledge of the analysis of forces and mechanical systems in a state of rest (balance) and motion.
- Qualify the student to apply the principles of equilibrium to particles and solid objects.

9. Course Outcomes, Teaching, Learning and Assessment Methods

Definition of Course Outcomes: It is a set of knowledge, skills, and values that the course seeks to achieve in students.

Importance: It provides the learner with a clear idea of what they will be able to do after the course is over, and helps in the design and evaluation of courses.

How they are determined: Course deliverables are determined based on the objectives of the academic program to which the course belongs.

Output	Teaching and Learning Methods	Evaluation Methods
A. Knowledge 1. Understand the basic principles of statics (forces, directions, moments, equilibrium). 2. Identify the types of supports and how to calculate reactions. 3. Know how to analyze trusses and frames. 4. Understand the concepts of friction and its applications. 5. Familiarity with the concepts of Center of Gravity and Moment of Inertia. 6. Understand the basic principles of dynamics. 7. Knowledge of Newton's laws of motion and their applications (work, energy, thrust and amount of motion).	"Presentation, Explanation, Q&A, Discussion, Problem Solving"	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
B. Skills	Active Learning: It involves active and	• Assignments and Duties

1. Draw Free Body Diagrams accurately. 2. Calculating the sum of the forces and determinations of the different systems. 3. Apply equilibrium equations to solve particle and solid body problems. 4. Analysis of internal forces in gables using the Method of Joints and the Method of Sections 5. Apply linear and rotational motion equations to describe particle motion. 6. Use the principles of workmanship, energy, thrust and amount of motion to solve dynamics problems.	interactive participation in the learning process through practicing activities and solving analytical problems.	• Quiz • Practical Testing • Monthly test • Final Written Exam
C. Values 1. Commitment to accuracy and scientific methodology in solving engineering problems. 2. Teamwork and cooperation with colleagues in solving problems and applications 3. Developing critical and analytical thinking skills. 4. Assume responsibility and discipline in submitting duties and reports. 5. Academic honesty and honesty. 6. Linking theoretical concepts with practical applications in mechanical power engineering.	Self-learning Collaborative learning Blended learning	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

10. Course Structure (Theoretical and Practical Vocabulary)

The week	Hours	Required Learning Outcomes	Module Name / or Subject	Teaching Method	Evaluation Method
The first	3	Introduce the student to the basic concepts of engineering mechanics.	Introduction to Statics, Vector Analysis, Forces and Results (2D).	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Second	3	Qualifying the student to apply the principles of balance to particles.	Particle equilibrium (Equilibrium of a Particle) in 2D and 3D.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Third	3	Providing the student with the basic knowledge of analyzing forces and systems.	Moments and Couples, the sum of the forces distributed.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourth	3	Qualify the student to apply the principles of balance to solid objects.	Rigid Body Equilibrium, Supports and Reflexes.	Active Learning: It involves active and interactive participation in the learning process through	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

				practical activities and applications.	
Fifth	3	Develop the student's skills in solving analytical problems.	Trusses Analysis – Joints Method.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Sixth	3	Develop the student's skills in solving analytical problems.	Trusses Analysis – Sections, Frames Method.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Seventh	3	Providing the student with the basic knowledge of force analysis.	Friction and its applications.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eighth	3	Providing the student with the basic knowledge of systems analysis.	Center of Gravity and Moments of Inertia.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Ninth	3	Introduce the student to the basic concepts of dynamics.	Introduction to Dynamics: Kinematics of a Particle – Straight Motion.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Tenth	3	Develop the student's skills in solving analytical problems of movement.	Particle kinematics – Curvilinear motion and projectiles.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eleventh	3	Providing the student with the basic knowledge of the analysis of the causes of motion.	Kinetics of a Particle – Newton's second law (F=ma) in different coordinates.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Twelfth	3	Develop the student's skills in solving analytical problems of movement.	Particle kinetics – The principle of work and energy.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Thirteenth	3	Develop the student's skills in solving analytical problems of movement.	Particle Kinetic – The principle of impulse and momentum.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourteenth	3	Providing the student with basic knowledge of the movement of objects.	Introduction to Kinematics of Rigid Bodies – Rotational and Planar Motion.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
fifteenth	3	Bernoulli's formula, applications	Bernoulli's formula, applications	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final

11. Course Development Plan

Updating the curriculum continuously to keep pace with the developments in engineering analysis methods (Curriculum Update Committee, Scientific Committee).

1. Linking theoretical problems to real-world practical applications in the field of mechanical power engineering.
2. Holding workshops on the use of modern software (e.g. MATLAB or SolidWorks Simulation) in solving mechanic problems.
3. Following up on scientific developments in the field of specialization.

12. Infrastructure

Classrooms	Available (equipped classrooms)
Required Textbooks	Available
Main References (Sources)	1. Engineering Mechanics: Statics by R.C. Hibbeler. 2. Engineering Mechanics: Dynamics by R.C. Hibbeler. 3. Vector Mechanics for Engineers: Statics and Dynamics by Beer, Johnston, and Mazurek.
Recommended books and references (scientific journals, reports, ...)	1. Engineering Mechanics: Statics and Dynamics by J.L. Meriam and L.G. Kraige. 2. Schaum's Outline of Engineering Mechanics: Statics. 3. Schaum's Outline of Engineering Mechanics: Dynamics.
Electronic references, websites, ...	

1. **Course Name**:

Heat Transfer and Fluids

2. **Course Code**:

PMTA125

3. **Semester /Year**

first level / 2024/2025

4. **Description Preparation Date**

22/6/2025

5. **Available Forms of Attendance**

In-person

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

45 Hours / 3 Units

7. **Name of the Rapporteur Administrator (name all names, if there is more than one)**

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8. **Course Objectives (General Course Objectives)**

1. Develop the ability to calculate variables and use their logic
2. Understanding the study of the different types of heat transfer and thermal insulation
3. Fully understand heat transfer and conduction heat transfer methods: static state thermal conductivity, homogeneous wall conductivity, composite wall conductivity, thermal resistance

9. Course Outcomes, Teaching, Learning and Assessment Methods

Definition: It is a set of knowledge, skills, and values that the course seeks to achieve in students.

Importance: It provides the learner with a clear idea of what they will be able to do after the course is over, and helps in the design and evaluation of courses.

How it is determined: E is determined based on the objectives of the academic program to which the course belongs.

Output	Teaching and Learning Methods	Evaluation Methods
A. Knowledge 1. Understand the basic concepts of heat transfer and thermal insulation. 2. Understand the different types of heat transfer (conduction – convection – radiation). 3. Understanding the properties of materials and their impact on heat transfer. 4. Knowledge of concepts related to thermal resistance and conductivity in composite systems. 5. Understand the basic laws governing heat transfer such as Fourier's law and Newton's law of cooling.	Presentation, Explanation, Q&A, Discussion	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

B. Skills 1. Develop the ability to calculate thermal variables such as heat transfer rate, temperature difference, and thermal resistance. 2. Analysis of Thermal Conductivity Systems in Fixed and un stationary Cases. 3. Application of mathematical relationships in the calculation of thermal conductivity across homogeneous and composite walls. 4. The use of geometric logic in explaining the behavior of insulating materials and their effect on thermal efficiency. 5. Preparation and Solution of Applied Engineering Problems Using Differential Equations for Thermal Conductivity.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
C. Values 1. Commitment to accuracy and discipline in conducting thermal calculations and laboratory experiments. 2. Promoting the spirit of teamwork and collaboration during the implementation of experiments and thermal transition projects. 3. Develop a professional sense in the safe handling of thermal devices and equipment. 4. Attention to the quality of performance and efficiency when analyzing thermal systems.	Self-paced learning Collaborative Learning Blended Learning	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

10. Course structure (remember all theoretical and practical vocabulary)					
The week	**Hours**	**Required Learning Outcomes**	**Module Name / or Subject**	**Teaching Method**	**Evaluation Method**
The first	3	**Introduce the student to heat transfer by conduction: thermal conductivity in a constant state, conductivity through a homogeneous flat wall, conductivity through composite wall, thermal resistance.**	**Conductive Heat Transfer**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Second	3	**Identify the thermal conductivity through a homogeneous cylindrical wall, thermal conductivity through a multi–**	**For Thermal Conduction**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

		layer cylindrical wall,			
Third	3	**Understanding the Method of Heat Transfer by Conduction**: **Forced Thermal Resistance**	**Heat Transfer Method by Plug**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourth	3	**Identify Radiation Heat Transfer**, **Definition of Thermal Radiation**, **Body Emission**	**–radiation heat transfer**,	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fifth	3	**–Identify heat exchangers and their peaks**, **logarithmic differences in temperatures**, **heat exchanger calculations**, **heat**	**Heat exchangers**	Active Learning: It involves active and interactive participation in the learning process through practical	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

		exchanger efficiency		activities and applications.	
Sixth	3	**– Types of unit systems**, **density**, **specific volume**, **pressure**, **temperature** (**Celsius and absolute**), **fluid properties**	**Types of systems**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Seventh	3	**– Identify density**, **relative density**, **specific weight**, **specific size**	**Density**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eighth	3	**–Recognition of shear stress**, **fluid flow dynamics**, **Newton's law of vein**	**Fluid Flow**	Active Learning: It involves active and interactive participation in the learning process through practical	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

				activities and applications.	
Ninth	3	**– Recognition of liquid pressure**, **Pascal's law of pressure**, **the difference in the temperature of liquid pressure relative to gravity**	**Pressure**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Tenth	3	**– Absolute pressure**, **gauge pressure**, **barometer**, **pressure measuring equipment**	**Absolute pressure**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eleventh	3	**– Bourdon gauge** , **pressure gauge**, **tubular pressure gauge**	**Standards**	Active Learning: It involves active and interactive participation in the learning process through practical	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

				activities and applications.	
Twelfth	3	**–Fluid Movement**, **Fluid Flow**, **Fluid Flow Pressure**, **Laminar Flow**, **Turbulent Flow**	**– Fluid movement**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Thirteenth	3	**– Flow rate**, **volumetric flow rate**, **mass flow rate**, **continuity equation**, **continuity problems**	**Flow Rate**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourteenth	3	**– Bernoulli equation**.	**Bernoulli's equation**	Active Learning: It involves active and interactive participation in the learning process through practical	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

				activities and applications.	
Fifteenth	3	**Applications of Bernoulli's equation**.	**Applications of Bernoulli's equation**.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

11. Course Development Plan

Updating the curriculum continuously in line with the developments of the labor market (Curriculum Modernization Committee, Scientific Committee) such as

1. Developing curricula that are appropriate for the labor market
2. Holding scientific seminars and conferences aimed at updating the school curriculum
3. Follow up on scientific developments in the field of specialization

12. Infrastructure

Classrooms	Available
Required textbooks (curriculum books)	Available
Main References (Sources)	Fluid Mechanics and Heat Transfer
Recommended books and references (scientific journals, reports...)	Analytical Methods for Heat Transfer and Fluid Flow Problems
References and Websites	

1. Course Name:

Thermodynamics

2. Course Code:

PMTA124

3. Semester /Year

first level / 2024/2025

4. Description Preparation Date

22/6/2025

5. Available Forms of Attendance

In-person

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

60 Hours / 4 Units

7. Name of the Rapporteur Administrator (name all names, if there is more than one)

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8. Course Objectives (General Course Objectives)

1. Develop the ability to calculate variables and use their logic
2. Understanding some different cycles such as (P-V diagram, T-S diagram, calculating variable temperature, and the work and efficiency of each cycle).
3. Fully understand the first and second laws of thermodynamics, ideal gas, and air cycles.

9. Course Outcomes, Teaching, Learning and Assessment Methods

Definition: It is a set of knowledge, skills, and values that the course seeks to achieve in students.

Importance: It provides the learner with a clear idea of what they will be able to do after the course is over, and helps in the design and evaluation of courses.

How it is determined: E is determined based on the objectives of the academic program to which the course belongs.

Output	Teaching and Learning Methods	Evaluation Methods
A. Knowledge 1. Identify basic concepts in thermodynamics such as: system, ocean, and internal energy. 2. Understand the first and second laws of thermodynamics and their applications in closed and open systems. 3. Understand the concept of ideal gas and the relationships between pressure, volume, temperature and energy. 4. Identify the types of thermal cycles (Carno, Auto, Diesel) and their diagrams (P–V, T–S).	Presentation, Explanation, Q&A, Discussion	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
B. Skills 1. Calculate thermal variables (pressure, volume, temperature, workpiece, and temperature). 2. Analyzing the performance of different heat cycles and determining the thermal efficiency of each cycle.	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

3. Reading and interpreting heat charts (P–V andT–S).		
C. Values 1. Commitment to accuracy and discipline in conducting thermal calculations and dealing with physical laws. 2. Promote teamwork and responsibility during thermal experiments.	Self-paced learning Collaborative Learning Blended Learning	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

10. Course structure (remember all theoretical and practical vocabulary)

The week	Hours	Required Learning Outcomes	Module Name / or Subject	Teaching Method	Evaluation Method
The first	4	**Introduce the student to the first law of thermodynamics**, **types of energy**, (**dynamic energy**, **potential mechanical energy**, **internal energy**, **heat**, **work**).	**The first law of thermodynamics**,	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Second	4	**Familiarity with the Pressure Chart System – Volume**	**Pressure–Size Chart**	Active Learning: It involves active and interactive	• Assignments and Duties • Quiz

				participation in the learning process through practical activities and applications	• Practical Testing • Monthly test • Final Written Exam
Third	4	**Identify the flow energy, the enthalpy energy conservation equation of the first law of thermodynamics classifications of systems,**	**The First Law of Thermodynamics**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourth	4	**Recognition of the Applications of the First Law of Thermodynamics to Closed Systems, Energy Equation of Constant Flow**	**– Applications of the First Law of Thermodynamics**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fifth	4	**–Identify the application of the first law of steady–state open systems,**	**Application to the First Law of Open Systems**	Active Learning: It involves active and interactive participation in	• Assignments and Duties • Quiz • Practical Testing

				the learning process through practical activities and applications	• Monthly test • Final Written Exam
Sixth	4	**– Working representation of open systems for constant flow on a volume chart – Pressure**	**Open Systems**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Seventh	4	**–Recognition of the second law of thermodynamics**: **reverse process**, **entropy**, **temperature and entropy diagram**, **place coordinates on the T–S diagram**, **cycles**	**The Second Law of Thermodynamics**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eighth	4	**–Recognition of shear stress**, **fluid flow dynamics**, **Newton's law of vein**	**Fluid Flow**	Active Learning: It involves active and interactive participation in	• Assignments and Duties • Quiz • Practical Testing

				the learning process through practical activities and applications	• Monthly test • Final Written Exam
Ninth	4	**– Identify the work of the cycle, the thermal efficiency of the cycle, examples. The case of the second law of the heat motor and heat pump**	**Sessions**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Tenth	4	**– Ideal Gas: Specific Heat at Constant Volume, Specific Heat at Constant Pressure, Ideal Gas State Equivalent, Gas Constant, General Gas Constant**	**Ideal Gases**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Eleventh	4	**Constant Volume Process**, **Constant Pressure Process**, **Constant Temperature Process**, **Process Study on P–V Diagram and T–S Diagram**	**–Procedures**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Twelfth	4	**–Adiabatic process**, **iso–strength operation**, **process study on P.V. diagram and T–S diagram**	**Adiabatic process**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Thirteenth	4	**– Thermodynamic cycles** (**Otto cycle – Otto cycle representation on P–V and T–S diagrams Thermal**	**Thermodynamic Cycles** (**OTTO**)	Active Learning: It involves active and interactive participation in the learning process through practical	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

		efficiency assessment)		activities and applications	
Fourteenth	4	**Thermodynamic cycles** (**diesel cycle – representation of the diesel cycle on P–V and T–S diagrams – evaluation of thermal efficiency examples on the diesel cycle**)	**Thermodynamic Cycles** (**Diesel**)	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fifteenth	4	**Combined cycle**, **cycle study on P–V and T–S diagram**, **Variable heat finding**, **work efficiency coefficients affecting standard air cycle efficiency**, **comparison between** (**automobile**, **diesel**, **double cycle**)	**Combined cycle**	Active Learning: It involves active and interactive participation in the learning process through practical activities and applications	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

11. Course Development Plan

Updating the curriculum continuously in line with the developments of the labor market (Curriculum Modernization Committee, Scientific Committee) such as

1. Developing curricula that are appropriate for the labor market
2. Holding scientific seminars and conferences aimed at updating the school curriculum
3. Follow up on scientific developments in the field of specialization

12. Infrastructure

Classrooms	Available
Required textbooks (curriculum books)	Thermodynamics
Main References (Sources)	Thermodynamics: An Engineering Approach (Yunus A. Çengel & Michael A. Boles)
Recommended books and references (scientific journals, reports...)	Fundamentals of Engineering Thermodynamics (Michael J. Moran & Howard N. Shapiro)
References and Websites	

1. Course Name:

English – 1

2. Course Code:

NTU101

3. Semester /Year

First level / 2024/2025

4. Description Preparation Date

22/6/2025

5. Available Forms of Attendance

In-person

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

30 Hours/2 Units

7. Name of the Rapporteur Administrator (name all names, if there is more than one)

Name: Qusay Kamil Jasim
Email: Qusay_hwj@ntu.edu.iq

8. Course Objectives (General Course Objectives)

1. Provide the student with the necessary basics in the English language (letters, numbers, pronouns).
2. Providing the student with basic knowledge about the rules of the simple present tense and how to form sentences.
3. Qualify the student to understand and use common everyday idioms and basic phrases.
4. Develop the student's basic skills in reading, writing, listening, and speaking to introduce himself and his environment.

9. Course Outcomes, Teaching, Learning and Assessment Methods

Definition of Course Outcomes: It is a set of knowledge, skills, and values that the course seeks to achieve in students.

Importance: It provides the learner with a clear idea of what they will be able to do after the course is over, and helps in the design and evaluation of courses.

How they are determined: Course deliverables are determined based on the objectives of the academic program to which the course belongs.

Output	**Teaching and Learning Methods**	**Evaluation Methods**
A. Knowledge 1. Alphabet and Numbers recognition. 2. Understand the uses of verb to be in the present tense 3. Knowledge of Subject Pronouns and Possessive Adjectives. 4. Understand the rules of the Simple Present for negation and interrogation. 5. Familiarity with the basic vocabulary (family, study, colors, days). 6. Identify a /an, plurals. 7. Know how to use (There is/There are).	"Presentation, Explanation, Q&A, Discussion, Class Exercises"	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
B. Skills 1. Write simple sentences and paragraphs to introduce yourself and family. 2. Read short and simple texts and understand the general idea of them.	Active Learning: It involves active and interactive participation in the learning process through the practice of	• Assignments and Duties • Quiz • Practical Testing • Monthly test

3. Conduct initial conversations (greeting, asking about the situation, introducing yourself). 4. Fill out the simple forms (name, age, address). 5. Use a dictionary (paper or electronic) to search for the meanings of words.	language activities and applications.	• Final Written Exam
C. Values 1. Commitment to attend and participate effectively in classroom activities. 2. Teamwork and collaboration with colleagues in bilateral exercises. 3. Develop self-confidence when speaking English. 4. Take responsibility for completing homework and self-learning. 5. Respect the opinions of colleagues and target language cultures.	Self-learning Collaborative learning Blended learning	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

10. Course Structure (Theoretical Vocabulary)

The week	Hours	Required Learning Outcomes	Module Name / or Subject	Teaching Method	Evaluation Method
The first	2	Introducing the student to the course, recognizing the letters and numbers.	Greetings, Alphabet, Numbers	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Second	2	Providing the student with the ability to introduce himself.	Verb to be (am/is/are), Subject Pronouns	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Third	2	Providing the student with the ability to ask about things.	Wh-Questions (What, Who, Where)	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourth	2	Providing the student with knowledge about the qualities of ownership.	Possessive Adjectives, Articles (a/an)	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fifth	2	Enable the student to talk about family and things.	Plural nouns, Possessive 's', Family Vocabulary	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Sixth	2	Enable the student to talk about the daily routine.	Simple Present Tense (Positive)	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Seventh	2	Enable the student to negate and form questions in the simple present.	Simple Present Tense (Negative & Questions)	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eighth	2	Providing the student with the skill of describing places.	There is / There are, Prepositions of Place	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Ninth	2	Enable the student to talk about abilities.	Can / Can't (Ability)	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Tenth	2	Providing the student with knowledge about the use of 'some' and 'any'.	'some' and 'any', Food Vocabulary	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eleventh	2	Enable the student to talk about the past.	Past Simple – Verb to be (was/were)	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Twelfth	2	Enable the student to narrate events in the past.	Past Simple (Regular verbs)	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Thirteenth	2	Enable the student to narrate events in the past.	Past Simple (Irregular verbs)	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Fourteenth	2	A thorough review of basic grammar and vocabulary.	General Revision and Writing Practice	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fifteenth	2	Final test.	Final Exam		Final Written Exam

11. Course Development Plan

Updating the vocabulary continuously in line with the needs of students in the engineering department.

1. Increase practical activities (language lab) to improve listening and pronunciation skills.
2. Linking writing topics to simple geometric topics.
3. Following up on recent developments in English language teaching methods.

12. Infrastructure

Classrooms, Laboratories & Workshops	Available (classrooms)
Required Textbooks	Available
Main References (Sources)	1- New headway Plus, Beginner Student's book by John & Liz Soars. Oxford. 2- New headway Plus, Beginner Workbook by John & Liz Soars. Oxford.
Recommended books and references (scientific journals, reports, ...)	3- Basic English Grammar by Betty Azar. 4- Oxford Picture Dictionary.
Electronic references, websites, ...	BBC Learning English, British Council Learn English

1. Course Name:
English - 2
2. Course Code:
NTU200
3. Semester /Year
Second Level / 2025-2026
4. Description Preparation Date
22/6/2025
5. Available Forms of Attendance
In-person
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours/2 Units
7. Name of the Rapporteur Administrator (name all names, if there is more than one)
Name: Qusay Kamil Jasim Email: Qusay_hwj@ntu.edu.iq
8. Course Objectives (General Course Objectives)
1. Improve students' English language skills. 2. Develop their reading, writing, and listening abilities. 3. Enable students to write scientific reports in English.

9. Course Outcomes, Teaching, Learning and Assessment Methods

Definition of Course Outcomes: It is a set of knowledge, skills, and values that the course seeks to achieve in students.

Importance: It provides the learner with a clear idea of what they will be able to do after the course is over, and helps in the design and evaluation of courses.

How they are determined: Course deliverables are determined based on the objectives of the academic program to which the course belongs.

Output	Teaching and Learning Methods	Evaluation Methods
A. Knowledge 1. Alphabet and Numbers recognition. 2. Understand the uses of verb to be in the present tense 3. Knowledge of Subject Pronouns and Possessive Adjectives. 4. Understand the rules of the Simple Present for negation and interrogation. 5. Familiarity with the basic vocabulary (family, study, colors, days). 6. Identify a /an, plurals. 7. Know how to use (There is/There are).	"Presentation, Explanation, Q&A, Discussion, Class Exercises"	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
B. Skills 1. Write simple sentences and paragraphs to introduce yourself and family. 2. Read short and simple texts and understand the general idea of them. 3. Conduct initial conversations (greeting, asking about the situation, introducing yourself).	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

4. Fill out the simple forms (name, age, address). 5. Use a dictionary (paper or electronic) to search for the meanings of words.		
C. Values 1. Commitment to attend and participate effectively in classroom activities. 2. Teamwork and collaboration with colleagues in bilateral exercises. 3. Develop self-confidence when speaking English. 4. Take responsibility for completing homework and self-learning. 5. Respect the opinions of colleagues and target language cultures.	Self-learning Collaborative learning Blended learning	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

10. Course Structure (Theoretical Vocabulary)

The week	Hours	Required Learning Outcomes	Module Name / or Subject	Teaching Method	Evaluation Method
The first	2	Providing the student with the skills of reviewing times and writing letters.	Tenses. Questions. Jobs. Writing an informal letter 1	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Second	2	Enable the student to use the simple present tense and have/have got.	Present tense, have/ have got	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Third	2	Providing the student with the vocabulary of the house and the tools of connection.	Things in the house. Writing-linking words	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourth	2	Enable the student to use the simple and continuous past.	Past tense. Past continuous, have + noun, writing a story 1	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fifth	2	Enable the student to distinguish between the	Count and uncounted nouns. Expressions of quantity. Articles, plural nouns, clothes	Active Learning: It involves active and interactive participation in the learning	• Assignments and Duties • Quiz • Practical Testing

		number and the counted.		process through the practice of language activities and applications.	• Monthly test • Final Written Exam
Sixth	2	Providing the student with knowledge of the future formulas.	Writing–forms. Verb patterns. Future forms. Words that go together. Writing a postcard	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Seventh	2	Enable the student to use comparison and preference formulas.	What…. Like? Comparatives and superlatives. Adjectives. Writing–describing a place	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eighth	2	Enable the student to use the present tense.	Present perfect. Men and women. Writing a biography	Active Learning: It involves active and interactive participation in the learning process through the practice of	• Assignments and Duties • Quiz • Practical Testing • Monthly test

				language activities and applications.	• Final Written Exam
Ninth	2	Providing the student with the knowledge of verbs (modals).	Have (got) to, should and most. Job descriptions. Writing a formal letter 1	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Tenth	2	Enable the student to use conditional and temporal sentences.	Conditional clauses. Time clauses. Preposition + word. Writing–discussing ideas	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Eleventh	2	Enable the student to use (used to) and (Infinitive).	Verb patterns, used to. Infinitive. Rhymes. Writing–formal and informal letters 1	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam

Twelfth	2	Enable the student to use the passive construct.	The passive. Words with more than one meaning. Writing a review	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Thirteenth	2	Enable the student to use the second conditional.	Second conditional, might, phrasal verbs. Writing a story 2	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fourteenth	2	Enable the student to use the present perfect continuous tense.	Present perfect Simple & continuous. Words that sound the same. Expressions in letter writing	Active Learning: It involves active and interactive participation in the learning process through the practice of language activities and applications.	• Assignments and Duties • Quiz • Practical Testing • Monthly test • Final Written Exam
Fifteenth	2	Enable the student to use	Past perfect. Reported statements. Words that	Active Learning: It involves active	• Assignments and Duties

		the past perfect and transmitted speech.	are often confused. Writing a story 3	and interactive participation in the learning process through the practice of language activities and applications.	• Quiz • Practical Testing • Monthly test • Final Written Exam

11. Course Development Plan

Updating the curriculum continuously in line with the developments of the labor market and the needs of the engineering departments.

1. Develop written topics that focus on scientific reports as stated in the course objectives.
2. Holding scientific seminars and conferences aimed at updating the curriculum for teaching English for engineering purposes.
3. Following up on scientific developments in the field of specialization.

12. Infrastructure

Classrooms, Laboratories & Workshops	**Available (classrooms)**
Required Textbooks	Available
Main References (Sources)	1- New headway Plus, Pre-Intermediate Student's book by John & Liz Soars Press. Oxford[47].
Recommended books and references (scientific journals, reports, ...)	2- New headway Plus, Pre-Intermediate Workbook by John & Liz Soars Press. Oxford[48].
Electronic references, websites, ...	

1. Course Name:
Automotive Engines Maintenance 1
2. Course Code:
PMTA120
3. Semester / Year:
first level / 2024/2025
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
90 Hours /6 Units
7. Course administrator's name (mention all, if more than one name)
Name: Essa Ahmed Essa Email: essa_hwj@ntu.edu.iq
8. Course Objectives
Understand the fundamentals of engine operation — explain the working principles, components, and syste of internal combustion engines (both gasoline and diesel). The ability to inspect and identify mechanical and electrical faults in cars and repair them. Identify engine components and their functions — recognize and describe the purpose, location, and interact of various engine parts. Perform routine engine maintenance — carry out inspection, cleaning, adjustment, lubrication, a replacement of engine components according to manufacturer specifications. Diagnose engine problems — use appropriate tools and diagnostic equipment to identify common engine fau such as poor performance, noise, overheating, and oil or fuel issues. Apply proper repair and overhaul procedures — demonstrate the correct methods for engine disassemb measurement, reconditioning, and reassembly following safety and technical standards

9. Course Outcomes, Teaching and Learning Methods, and Assessment

Acquiring practical skills to have the ability to maintain and repair parts and components of cars (diesel a gasoline).

Identify and describe the functions of major engine components and auxiliary systems.

Perform routine maintenance, inspection, and servicing of automotive engines following manufactu standards.

Diagnose engine faults using appropriate tools, instruments, and diagnostic procedures.

Carry out engine repair, reconditioning, and overhaul operations safely and efficiently.

Apply safety procedures, workshop discipline, and environmental standards during engine maintenance wo

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation Method
1	6	An overview of the histo of cars and the main car parts The number and to used in maintenance	General idea – about cars	Lecture + The worksho	Daily exams
2	6	Gasoline engines (two-stroke and four-stroke).	Gasoline engine	Lecture + The worksho	Daily exams
3	6	A general explanation of how a modern car engine works and how it produc power	engines work	Lecture + The worksho	Daily exams
4	6	Diesel engine, how it works, its types, and how to produce energy from i	Diesel engine	Lecture + The worksho	Daily exams
5	6	Explanation of two-strok diesel engines, the basic differences between gasoline and diesel engin	Diesel and gasolin engines	Lecture + The workshop	Daily exams

6	6	An explanation of rotary and turbine engines and their comparison with conventional engines	-Rotary and turbi engines	Lecture + The workshop	Daily exams
7	6	Basic engine components The fixed parts of the engine and the function each part	-Basic engine part	Lecture + The workshop	Daily exams
8	6	Basic engine components: moving parts and the function of each part	- Moving engine components	Lecture + The workshop	Daily exams
9	6	Pistons and their types, piston rings and their function, connecting rods and connection methods, valves and their types, the most important malfunctions and how to maintain them.	Moving engine parts	Lecture + The workshop	Daily exams
10	6	Air intake system, exhaust system and its parts, mechanical fuel injection system (carburetor), general idea	- Fuel system in engines	Lecture + The workshop	Daily exams
11	6	A general idea about the electronic fuel injection system, identifying the main parts of the system	-Fuel injection systems	Lecture + The workshop	Daily exams

12	6	Types of electronic injection systems used in modern cars (TBI, MONO)	- Multiple fuel injection systems	Lecture + The workshop	Daily exams
13	6	The VVT system and how it works	- The VVT system and how it works	Lecture + The workshop	Daily exams
14	6	Parts of modern injection systems and the function of each part	- Parts of modern injection systems and the function of each part	Lecture + The workshop	Daily exams
15	6	Comparison between the old car engine and the modern car engine (additions made to the engine)	- Comparison between the old car engine and the modern car engine	Lecture + The workshop	Daily exams
1	6	An overview of the history of cars and the main car parts The number and tools used in maintenance	General idea – about cars	Lecture + The workshop	Daily exams
2	6	Gasoline engines (two-stroke and four-stroke).	Gasoline engines	Lecture + The workshop	Daily exams
3	6	A general explanation of how a modern car engine works and how it produces power	engines work	Lecture + The workshop	Daily exams
4	6	Diesel engine, how it works, its types, and		Lecture +	Daily exams

		how to produce energy from it	Diesel engine	The workshop	
5	6	Explanation of two-stroke diesel engines, the basic differences between gasoline and diesel engines	Diesel and gasoline engines	Lecture + The workshop	Daily exams
6	6	An explanation of rotary and turbine engines and their comparison with conventional engines	-Rotary and turbine engines	Lecture + The workshop	Daily exams
7	6	Basic engine components: The fixed parts of the engine and the function of each part	-Basic engine parts	Lecture + The workshop	Daily exams

11. Course Development Plan

Providing modern inspection and maintenance equipment that matches the development in the world of cars
Interactive lectures and multimedia presentations
Group discussions and case studie
Hands-on workshop and lab activities

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Crouse, W.H. & Anglin, D.L. *Automotive Mechanics.*
Main references (sources)	Heitner, J. *Automotive Engine Repair and Rebuilding.*
Recommended books and references (scientific journals, reports…)	Hillier, V.A.W. *Fundamentals of Motor Vehicle Technology.*
Electronic References, Websites	

1. Course Name:
Automotive Electrics and Electronics1
2. Course Code:
PMTA122
3. Semester / Year:
First level / 2024/2025
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
60Hours /4 Units
7. Course administrator's name (mention all, if more than one name)
Name: Abdulqader Jihad Ahmed Email: abdulqader_haw@ntu.edu.iq
8. Course Objectives
1- He fully understands the principles and method of operation of the car's electrical and electro systems 2- Use scientifically correct devices to inspect, test, and diagnose faults in electrical systems And electronics in the car. 3- He carries out periodic inspections and maintenance of the car's electrical and electronic systems. 4- Recognizes symbols, terms, diagrams, and electrical and electronic elements of systems The Car . 5- Examines all electrical and electronic components to determine their suitability.

9. Course Outcomes, Teaching and Learning Methods, and Assessment

1. Learn the basics of automotive electrical engineering
2. Define basic electrical terms such as voltage, current, resistance, and power.
3. Be able to diagnose automotive faults
4. Identify major automotive electrical components and their functions.
5. Use wiring diagrams and diagnostic flowcharts to troubleshoot electrical faults.
6. Distinguish between mechanical, electrical, and electronic causes of system malfunction.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation Method
1	4	Introducing the student to the types of electrical power, the main electrical sources of the car, the type of electricity used in the car, as well as the magnetic theory	- Introduction to the general principles of automobile electrical	Lecture + film screening + laboratory	Daily exams
2	4	Learn about Krishof's laws and types of electrical circuits (connecting resistors), series, and parallel.	-Methods of connecting electrical circuits	Lecture + film screening + laboratory	Daily exams
5-4-3	12	Learn how to use the solutions used for batteries, definitions of alternating current, and infer which part of the car works.	- How to check batteries	Lecture + film screening + laboratory	Daily exams
6	4	-Learn about the general properties of magnetism and the relationship between	- General properties of magnets	Lecture + film screening + laboratory	Daily exams

		electrical energy, magnetic energy, and electromagnetic induction			
7	4	- Identifying the charging circuit in the car, a general idea about the direct current (DC) generator, its parts and components, its working principle, the general diagram of the generator's electrical circuit.	- Charging circuits for a DC generator	Lecture + film screening + laboratory	Daily exams
8	4	- The charging circuit for the alternating current (AC) generator, its parts, components, working principle, general diagram of the generator's electrical circuit.	- Charging circuits for an alternating current generator	Lecture + film screening + laboratory	Daily exams
9	4	- Identifying the starter motor (the predecessor), its parts, components, principle of operation, and the general diagram of the electrical circuit.	- The engine (predecessor) how it works	Lecture + film screening + laboratory	Daily exams
11-10	8	- Identifying the connection of energy sources (batteries) and the ignition system	- Battery connection sources	Lecture + film screening + laboratory	Daily exams
12	4	- Identify the main, side and interior lighting system	- Lighting system	Lecture + film screening + laboratory	Daily exams

13	4	- Auxiliary devices in the car (fuel gauge, oil pressure gauge, charging current gauge, temperature gauge)	- Auxiliary devices in the car	Lecture + film screening + laboratory	Daily exams
14	4	- The electrical circuit to control the car doors and windows (opening and closing).	- Electrical circuits in cars	Lecture + film screening + laboratory	Daily exams
15	4	Windshield wiper device and electrical audio circuit	- Electrical circuits	Lecture + film screening + laboratory	Daily exams

11. Course Development Plan

1- The expansion of the study of automotive electronics began with the study of semiconductors and the electronic elements involved

In the electrical network. It ends with an analysis of the electronic networks involved in the car's electrical system.

2- Keeping pace with the great development taking place in automotive technology, especially in the field of electronic ignition systems And electronic fuel injection systems

3 - Building electrical and electronic training panels that simulate the actual systems in the car.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Automotive electrical books
Main references (sources)	1-Auto Electrical & Electronic System. 2-Modern Automotive Electricity
Recommended books and references (scientific journals, reports...)	Advaanced Automotive Technolo
Electronic References, Websites	www.Edec.Workshap

1. Course Name:
Automotive Engines Maintenance 2
2. Course Code:
PMTA121
3. Semester / Year:
first level / 2024/2025
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
6 Hours / 6 Units
7. Course administrator's name (mention all, if more than one name)
Name: Essa Ahmed Essa Email: essa_hwj@ntu.edu.iq
8. Course Objectives
1- Introducing students to car engine maintenance . 2- The ability to inspect and identify mechanical and electrical faults in cars and repair them. 3- The ability to maintain and repair parts and components of cars (diesel and gasoline). 4- Carrying out periodic maintenance for gasoline and diesel cars.

9. Course Outcomes, Teaching and Learning Methods, and Assessment

1 - Knowing the mechanism of operation of parts and components in both diesel and gasoline cars.

2- Knowledge of diagnosing faults in cars

3 - Acquiring practical skills to have the ability to maintain and repair parts and components of cars (di
and gasoline).

4- Acquiring the necessary mechanical skills in the process of maintenance, repair, and performing required services for cars .

5- Acquires the necessary electrical and electronic skills in the process of diagnosing faults in automobile electrical network

6- Carrying out diagnostics, maintenance and repair operations using modern hardware technologie

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation Method
1	6	Engine auxiliary systems , a system that cools the engine with water	Systems	+ The lecture The workshop	Daily exams
2	6	Thermostat used in the engine cooling system	Thermostat	+ The lecture The workshop	Daily exams
3	6	, water cooling system Engine air cooling system	Cooling - system	+ The lecture The workshop	Daily exams
4	6	, lubrication organization parts of the system and the function of each part	Lubrication organization	+ The lecture The workshop	Daily exams

5	6	The most important malfunctions of the lubrication system, methods of detecting and maintainin them	Lubrication system malfunctions	+ The lecture The workshop	Daily exams
6	6	The normal ignition system (battery), the parts of the system and how they work	Regular ignitio system	+ The lecture The workshop	Daily exams
7	6	Electronic ignition system, types, components and how it works	Electronic ignition system	+ The lecture The workshop	Daily exams
8	6	Methods for detecting the causes of low engine efficiency	Engine malfunctions	+ The lecture The workshop	Daily exams
9	6	Methods of diagnosing and repairing engine faults	Diagnosing engine faults	+ The lecture The workshop	Daily exams
10	6	The process of removing carbon and deposits from the combustion chamber and valve seats (crane (process	Removing carbon from th combustion chambers	+ The lecture The workshop	Daily exams
11	6	The most important fixed and variable measurements used in ,turning cylinders crankshafts and camshafts	Crankshaft and camshaft measurements	+ The lecture The workshop	Daily exams
12	6	Methods of removing and inserting cylinder liners into the cylinder block	Cylinder block	+ The lecture The worksho	Daily exams
13	6	Checking the pressure and temperature	Electronic injection systen	+ The lecture The workshop	Daily exams

		regulators for the electronic injection system			
14	6	The most important causes of engine , overheating are slapping knocking , difficulty in ignition , high oil consumption , and high .fuel consumption	Engine malfunctions	+ The lecture The worksho	Daily exams
15	6	Identify the devices for checking and diagnosing engine faults	Devices for checking and diagnosing engine faults	+ The lecture The workshop	Daily exams

11. Course Development Plan

1- Providing modern inspection and maintenance equipment that matches the development in the world of cars

2- Demonstrations of engine servicing procedures

3- Group work and problem-solving sessions

4- Instructor reflection and course alignment checks

5- Review based on lab performance data and assessments

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Car Maintenance A.M. Walid Al-Jarrah
Main references (sources)	Some references available in the library
Recommended books and references (scientific journals, reports...)	All scientific books related to car maintenance
Electronic References, Websites	

1. Course Name:
Automotive Bodywork1
2. Course Code:
PMTA217
3. Semester / Year:
Second level / 2024/2025
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
45 Hours /3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Jasim Ibrahim Musa Email: jasim_hwj@ntu.edu.iq
8. Course Objectives
1- Introducing the student to the materials involved in the manufacture of automobile bodie 2- Describe the structure, materials, and design principles of vehicle body panels and frames. 3- Identify different body types and their functional features. 4- Apply correct procedures for dent removal, panel alignment, and minor collision repairs. 5- Perform basic welding, soldering, riveting, and bonding operations used in automotive bo repair. 6- Follow correct safety practices related to chemical handling, fire hazards, and worksh operations. 7- Diagnose and Assess Body Damage.

9. Course Outcomes, Teaching and Learning Methods, and Assessment

1- Describe vehicle body structures, materials, corrosion mechanisms, and body repair principles.

2- Explain procedures for dent repair, welding, surface preparation, and refinishing.

3- Perform body repair operations such as panel beating, dent removal, alignment, welding, cutting, a surface finishing.

4- Carry out paint preparation, priming, spraying, and polishing to industry standards.

5- Inspect and evaluate body damage, identify structural and cosmetic defects, and determine appropr repair methods.

6- Operate body shop equipment (welders, spray guns, pneumatic tools, grinders) safely and efficien

7- Apply modern repair technologies such as adhesive bonding, plastic repair, and filler application.

8- Demonstrate proper safety procedures in handling chemicals, welding equipment, and paint materials.

9- Practice professional, ethical, and environmentally responsible behavior in the workshop.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation Method
1	3	that Can requester Identi on date development the car	industry the cars	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
2	3	An overview of the car ,body and chassis industry body construction and learning about Different designs of car bodies and structures	Car body and chassis manufacturing	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
4-3	6	Engineering materials use in the manufacture of the ,body and body of the ca materials Ferrous, non-	Engineering materials	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams

		ferrous materials (types ar (specifications			
5	3	Properties of engineering materials (physical properties, mechanical ,properties ,Friability mechanical tests (	Properties of engineering materials	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
6	3	Stress and simple emotion	Stress and simple emotion	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
7	3	,Direct or vertical stress direct strain	Stress and direct emotion	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
8	3	Elastic materials Hooke's law –		+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
9	3	- Modulus of elasticity Young's modulus	Modulus of elastic	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
10	3	Tensile test (stress-strain (diagram	Stress and strain diagram	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
11	3	Relatively simple transformation problems	Issues	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
12	3	Arc welding, arc initiatio and arc re-initiation	Electric arc weldi	+ The lecture Show movies	Tests Daily + tests

				+ The workshop	+ Practical final exams
13	3	Electrical resistance welding - spot welding	Electrical resistanc welding	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams
15-14	6	Gas welding - heating sources - oxyacetylene equipment - torch Oxyacetylene - types of torches	Gas welding	+ The lecture Show movies + The workshop	Tests Daily + tests + Practical final exams

11. Course Development Plan

1-Describe automotive body structures, materials, and corrosion mechanisms.

2- Identify and use tools, equipment, and materials employed in body repair and finishing.

3- Perform dent removal, panel beating, alignment, and welding techniques.

4- Diagnose body damage and plan appropriate repair methods.

5- Perform structural and cosmetic repairs accurately.

6- Carry out surface preparation, priming, painting, and finishing processes.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Car body book
Main references (sources)	Two bodies the cars a . M . child surgeon
Recommended books and references (scientific journals, reports...)	Methods Manufacturing Dr. Do you know? Abu Safia , university Technology
Electronic References, Websites	resistance Materials Doge Mohammed Smokey technique Auto parts

1. Course Name:
Internal Composition Engine1
2. Course Code:
PMTA214
3. Semester / Year:
First level / 2024/2025
4. Description Preparation Date:
22/6/2025
5. Available Attendance Forms:
in person
6. Number of Credit Hours (Total) / Number of Units (Total)
60 Hours /4 Units
7. Course administrator's name (mention all, if more than one name)
Name: Essa Ahmed Essa Email: essa_hwj@ntu.edu.iq
8. Course Objectives
1. Understand the operating principles of internal combustion engines, including SI (spark ignition) a CI (compression ignition) engines. 2- Describe thermodynamic cycles (Otto, Diesel, Dual) and their relevance to engine performance. 3- Analyze Engine Performance – Interpret performance parameters such as torque, power, efficiency, air–fuel ratio, and compression ratio. 4- Apply thermodynamic and combustion principles to evaluate engine output and efficiency. 5- Understand Combustion and Emissions – Describe combustion processes, fuel characteristics, flame formation, and knocking phenomena. 6- Explain how pollutants form and identify emission control technologies. 7 – To be able to calculate the performance parameters of internal combustion engines (gasoline and diesel) and their effect on operating variables.

9. Course Outcomes, Teaching and Learning Methods, and Assessment

1- Describe the working principles of SI and CI engines.

2- To be able to calculate the performance parameters of internal combustion engines (gasoline and diesel) and their effect on operating variables.

3- Interpret engine performance parameters (power, torque, BSFC, efficiency).

4- Analyze combustion characteristics and factors affecting performance and thermal efficien

5- Evaluate emission control systems such as catalytic converters, EGR, and aftertreatm devices.

6- Read and interpret engine manuals, service data, diagrams, and performance curves.

7- Describe advancements in turbocharging, GDI, variable valve timing, and hybrid engine systems.

8- Losses in engine efficiency and performance and how to control and reduce them .

9 - To be able to know everything related to fuel, its types, ways to improve its efficiency, and fuel supply systems for the engine as well.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation Method
1	4	Identify the components Terminology and everything related Internal combustion engine And how to classify	Engine terminology the basic	Lecture + film + screening laboratory	+ Daily exar + semester final exams
2	4	Learn how to work Gasoline and diese four-wheel drive T runs	Heat ignition engine Four-stroke engine Four-way compression ignition The runs	Lecture + film + screening laboratory	+ Daily exar + semester final exams
3	4	Learn the importance and how Valve timing for an engine Four-stroke	Valve timing for an engine Four-stroke	Lecture + film + screening laboratory	+ Daily exar + semester final exams

4	4	Recognizes the dual motor The runs and how to time the slots Exhaust and intake with movement Piston and compare with an engine Fou stroke	Two-stroke engine Comparison of four-wheel drive Runs and timing Valves for a dual engine The runs	Lecture + film + screening laboratory	+ Daily exar + semester final exams
5	4	Learn about scavenging systems Exhaust gases in a dual engine Runs and comparison between these Systems	Systems Exhaust gase	Lecture + film + screening laboratory	+ Daily exar + semester final exams
6-7-8	12	Identify performance Quad parameters and twin engines The runs and how to calculate their And also values Identify devices Measure these transactions	Engine performance , and testing Performance transactions For engin Four- and two-stroke Indicators of basic measurements	Lecture + film + screening laboratory	+ Daily exar + semester final exams
9-11	12	Recognize behavic curves Engine parameters chang Varies with changi working condition Diesel engine Gasoline and vario examples	Ignition engine performance With spark and engine ignition Click for illustrative examples	Lecture + film + screening laboratory	+ Daily exar + semester final exams
12	4	Recognizes the parts of energies In and out from and to the engine	Thermal energy balance the engine	+ Lecture film + screening laboratory	Daily + exams + semester final exams
13	4	Understand the effect of mixture strength. Air and fuel) on	Effect of mix Fr strength	+ Lecture film + screening laboratory	Daily + exams + semester

		transactions Engine performance	On engine performance parameters		final exams
14	4	Find out how it happens Combustion in an ignition engine Sparks and the stages of this combustion	Combustion in engines ,Spark ignition stages Combustion in engines Spark ignition	+ Lecture film + screening laboratory	Daily + exams + semester final exams
15	4	Understand the influence of variables Different motor phases Combustion in the engine	Effect of engine variables On the stages of combustion in Spark ignition engine	+ Lecture film + screening laboratory	Daily + exams + semester final exams

11. Course Development Plan

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	