

9. Course syllabus

Module Information					
Module Title	Engineering Mechanics/ Statics		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 100				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		1	Semester of Delivery		1
Administering Department		PM	College	TEMO	
Module Leader	Tariq Khalid		e-mail	tariqaikhalidi@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Prof.	Module Leader's Qualification		M. Sc.
Module Tutor	Tariq Khalid		e-mail	tariqaikhalidi@ntu.edu.iq	
Peer Reviewer Name		Asma Taha	e-mail	11smaa.taha@ntu.edu.iq	
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	Module Objectives for Engineering Mechanics/Statics: 1. Understand the fundamental concepts and principles of Statics, including motion, forces, and acceleration. 2. Apply kinematic equations to analyze the motion of particles and rigid bodies in various scenarios. 3. Determine the relationship between forces, mass, and acceleration using Newton's laws of motion. 4. Apply the principles of work and energy to analyze and solve dynamic problems. 5. Analyze and calculate linear and angular momentum, and apply the principle of impulse and momentum to dynamic systems. 6. Understand and apply the principles of vibrations and oscillations in mechanical systems. 7. Apply principles of balancing rotating masses and vibrations to ensure smooth operation of machinery. 8. Analyze multi-degree of freedom systems and determine their natural frequencies and mode shapes. 9. Apply dynamic principles to real-world engineering problems and systems.				
Module Learning Outcomes	1. Apply fundamental concepts of engineering mechanics/statics to analyze and solve problems related to the equilibrium of rigid bodies. 2. Demonstrate a deep understanding of vector mathematics and its application in statics, including vector addition, subtraction, dot product, and cross product. 3. Apply the principles of static equilibrium to solve problems involving forces and moments acting on rigid bodies in two and three dimensions. 4. Analyze and calculate the internal forces, such as axial forces, shear forces, and bending moments, in statically determinate structures using methods such as the method of sections and the method of joints. 5. Utilize free-body diagrams to model and analyze the forces acting on a structure or a rigid body, and determine the resultant forces and moments at				

	specific points. 6. Analyze and calculate the centroid and moment of inertia of various two-dimensional shapes, including rectangles, triangles, and circles, and apply these concepts to determine the stability and strength of structures. 7. Apply the concepts of friction and its effects on the equilibrium of bodies in statics, including calculating static and kinetic friction forces and determining the angle of friction. 8. Analyze and calculate the forces in trusses and frames, including the method of joints and the method of sections, and determine the stability and structural integrity of these systems.		
Learning and Teaching Strategies			
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.		
Student Workload (SWL)			
Structured SWL (h/sem)	78	Structured SWL (h/w)	5
Unstructured SWL (h/sem)	97	Unstructured SWL (h/w)	6
Total SWL (h/sem)	175		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introduction, Fundamental Concepts, Units Conversion, Scalar and Vector Quantities.		
Week 2-4	Resultant force Resolution & Composition of Forces. Triangle & parallelogram law		
Week 5	Addition of a System of Coplanar Forces: Scalar Notation, Cartesian Vector Notation		
Week 6-7	Equilibrium of a Particle		
Week 8	Moment of a Force, Vibration Theorem.		
Week 9	Moment of a Couple		
Week 10-11	Equilibrium of a Rigid Body		
Week 12	Distributed loads.		
Week 13	Friction		
Week 14	Centroid		
Week 15	Centroid of area, First moment of area.		
Week 16	Area moment of inertia, Second moment of area.		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Engineering Mechanics/ Statics, by R.C. Hibbeler	Yes	
Recommended Texts	2- Engineering Mechanics, Ferdinand L. Singer 2- Engineering Mechanics, Meriam	No	
Websites			

Module Information				
Module Title	Mathematics Principles		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	TECM 100			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	1	Semester of Delivery		
Administering Department	AM	College	TEMO	
Module Leader	Raid Abdulhadi Abdulquader	e-mail	raid.alabdullah@ntu.edu.iq	
Module Leader's Acad. Title	Assist. Lecturer	Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	6/10/2025	Version Number	1.0	
Relation with other Modules				
Prerequisite module	None	Semester		
Co-requisites module	None	Semester		
Module Aims, Learning Outcomes and Indicative Contents				
Module Objectives	To let students be able to identify the advanced basic fundamentals in mathematics (differentiation and integration and their different applications) to develop their mentally capability by exercises solution. Also, can be able to correlate the information data in order to solve the scientific problem and how to make use of it in other scientific subjects.			
Module Learning Outcomes	1. Students are able to relate the significance of comprehending algebra's structure to a higher-level subject. 2. Within the parameters of the theory of modules, students have the ability to generate consciousness, particularly symbolic thinking. 3. Students are capable of using their understanding and analyzing models of mathematics, science, and technology, as well as other fields that are relevant to those disciplines. 4. Students are able to convey the outcomes of the growth of oral and writing comprehension as well as construct a framework for knowledge that supports mathematics, science, and technology.			
Learning and Teaching Strategies				
Strategies	to accommodate varied talents, skills, learning rates, and learning styles, teaching and learning strategies might involve a variety of whole class, group, and individual activities. This enables every student to engage and succeed. Incorporating visual aids, hands-on tasks, real-life applications, and technology enhances understanding, motivation, and retention of mathematical concepts. Regular feedback, peer collaboration, and differentiated instruction help address individual needs and foster deeper comprehension and problem-solving skills. Encouraging critical thinking, promoting discussion, and connecting topics to students' interests enrich the learning experience and support active, meaningful participation.			
Student Workload (SWL)				

Structured SWL (h/sem)	63	Structured SWL (h/w)
Unstructured SWL (h/sem)	112	Unstructured SWL (h/w)
Total SWL (h/sem)	175	
Delivery Plan (Weekly Syllabus)		
	Material Covered	
Week 1	To let students be able to identify the advanced basic fundamentals in mathematics (differentiation and integration and their different applications) to develop their mentally capability by exercises solution. Also can be able to correlate the information data in order to solve the scientific problem and how to make use of it in other scientific subjects.	
Week 2	Trigonometric functions, trigonometric relations, graphic drawing, applications	
Week 3	Limits of algebraic and trigonometric functions, limit near, applications	
Week 4	Theory of derivatives, derivative of algebraic and trigonometric and empirical functions	
Week 5	Chain rules, applications	
Week 6	Inverse functions and inverse of trigonometric functions, applications	
Week7	Derivatives of logarithmic and exponential functions, hyperbolic and its derivatives, relation and drawing, applications	
Week 8	Integration theory, indefinite and definite integration, trigonometric and its inverse	
Week 9	Integration of logarithmic and exponential functions, integration of hyperbolic functions, other integrations	
Week 10	Methods of integrations, integration by parts	
Week 11	Integration by partial fractions	
Week 12	Area under a curve, area between two curves	
Week 13	Volumes by revolutions, length of a curve	
Week 14	Simple differential equations	
Week 15	Approximate area by trapezoidal and Simpson rule, numerical integration, applications	
Week 16	Preparatory week before the final Exam	
Learning and Teaching Resources		
	Text	
Required Texts	" Calculus " , Ford , S.R. and Ford , J.R. , (1963) McGraw-Hill	
Recommended Texts	“Principles of Mathenatics”, Katherine A. Loop., (2015)	
Websites	https://web.math.ucsb.edu/~agboola/teaching/2021/winter/122A/rudin.pdf	

Module Information				
Module Title	Electrical technology		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	PM 101			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	1	Semester of Delivery		1
Administering Department	PM	College	TEMO	
Module Leader	Safwan Assaf Hamoodi		e-mail	Safwan79azb@ntu.edu.iq
Module Leader's Acad. Title	Assist. Prof.		Module Leader's Qualification	M. Sc.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	6/10/2024	Version Number	1.0	
Relation with other Modules				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	
Module Aims, Learning Outcomes and Indicative Contents				
Module Objectives	1. Preparing the student to study the different calculations in alternating current and direct current circuits, and to get acquainted with the various theories to study these calculations. 2. Understanding electrical principles and concepts: The module aims to provide students with a clear understanding of electrical principles and concepts, including voltage, current, resistance, and power. Students will learn how these concepts are applied in electrical circuits and systems. 3. Developing practical skills in electrical measurements and testing: The module aims to equip students with practical skills in using electrical instruments and equipment for measurements and testing. Students will learn how to perform accurate measurements, interpret the results, and troubleshoot electrical systems. 4. Applying knowledge to electrical machines and power systems: The module aims to enable students to apply their knowledge of electrical technology to the operation and maintenance of electrical machines, such as motors and generators. Students will also gain an understanding of power systems and their components, including power generation, transmission, and distribution.			
Module Learning Outcomes	1. Understanding electrical circuit theory: Students will gain knowledge of fundamental electrical circuit theory, including concepts such as voltage, current, resistance, and power. They will be able to apply this understanding to analyze and solve basic electrical circuits. 2. Proficiency in electrical measurements and testing: Students will develop skills in using electrical instruments and equipment to measure and test electrical parameters. They will learn how to interpret measurement results and troubleshoot electrical systems to identify faults. 3. Application of electrical machines and power systems: Students will learn about electrical machines, such as motors and generators, and their operating principles. They will understand the characteristics and applications of these machines.			

Learning and Teaching Strategies				
Strategies	1. Active Engagement: Actively engage with the subject matter by participating in class discussions			
	2. Practice Problem Solving: Electrical Technology involves problem-solving skills.			
	3. Hands-on Experience: Gain practical experience by participating in laboratory sessions and hands-on projects.			
	4. Collaborative Learning: Engage in group discussions and study sessions with classmates.			
	5. Utilize Resources: Take advantage of resources such as textbooks, online tutorials, video lectures, and educational websites to supplement your learning.			
	6. Time Management: Create a study schedule and allocate dedicated time for studying Electrical Technology.			
Student Workload (SWL)				
Structured SWL (h/sem)		78	Structured SWL (h/w)	5
Unstructured SWL (h/sem)		72	Unstructured SWL (h/w)	5
Total SWL (h/sem)		150		
Delivery Plan (Weekly Syllabus)				
	Material Covered			
Week 1	Symbols and abbreviations, electric circuit and its elements			
Week 2	The direct-current network (kerchief's law & their use in network analysis			
Week 3	Conversion of delta-connected resistance into an equivalent Wye connection & vice versa			
Week 4	Power sources connected in parallel, node voltage method			
Week 5	Loop current method.			
Week 6	Super position method.			
Week7	Thevenin's theorem and Norton's theorem.			
Week 8	Maximum power transfer.			
Week 9	Reciprocity theorem			
Week 10	Sinusoidal excitation, average, effective values and their steady- state analysis			
Week 11	Generation of alternating current, sinusoidal current			
Week 12	The mean values of current and voltage			
Week 13	Complex Frequency, s-Plane, Poles and Zeros, Response Function, Bode Plots			
Week 14	Frequency Response of Series/Parallel Resonances, High-Q Circuits			
Week 15	Mutual Inductance, Linear and Ideal Transformers, Circuits with Mutual Inductance			
Week 16	Final Examination			
Learning and Teaching Resources				
	Text	Available in the Library?		
Required Texts	Electric Machinery and Power System Fundamentals" by Stephen J. Chapman	Yes		
Recommended Texts	Electricity and Electronics for HVAC" by Rex Miller and Mark R. Miller	No		
Websites	(www.allaboutcircuits.com)/ (www.electrical4u.com) /(www.khanacademy.org)			

Module Information					
Module Title	Workshop		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 102				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		1	Semester of Delivery		1
Administering Department		PM	College	TEMO	
Module Leader	Abdullah Adel Badr		e-mail	abdulladel06@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Lecturer	Module Leader's Qualification		M. Sc.
Module Tutor	Mohamed Nazar Yahya		e-mail	mohammed.nazar.yahya@ntu.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	Maintenance of Refrigeration & Air Conditioning Systems			Semester	6
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. Teach students the basic principles of the compression refrigeration cycle. 2. Identify the tools used in the field of refrigeration and air-conditioning in general. 3. Training students on the operations carried out on pipes used in the field of refrigeration and air-conditioning. 4. Teaching students the basic operations of refrigeration and air-conditioning equipment. 5. Introducing students to the main parts that make up refrigeration and air-conditioning equipment of all kinds. 6. Teaching students about the electrical and mechanical parts of household refrigeration and air-conditioning devices. 7. Learn about the types of furnaces for melting metals, and how to pour molten metal into sand molds. 8. Identify the types of filings and their shapes. 9. Learn about all types of lathes and how to use them. 10. Learn how to deal with sheet metal. 11. Learn about the most important methods of welding and the machines and tools needed for that.				
Module Learning Outcomes	1. The student learned the processes of cutting, flaring and expanding pipes. 2. The student learned the processes of welding pipes of all kinds. 3. The student learned about the processes that take place on refrigeration and air-conditioning equipment, such as checking for leaks, vacuum and charging. 4. Students' ability to know the refrigerant fluids used in refrigeration and air-conditioning devices. 5. The student learned to connect electrical circuits for refrigeration and air-conditioning equipment. 6. The student's ability to distinguish the pressures used in the field of refrigeration and air conditioning from leakage checks, discharge and charging of all devices. 7. The student's ability to melt metals, how to pour the molten metal into sand				

	molds, how to deal with the mold and fix it with sand, and how to get it out of the sand.		
Learning and Teaching Strategies			
Strategies	Strategies include teaching core refrigeration and air-conditioning principles, familiarizing students with tools and components, and providing hands-on training in pipework, lathes, sheet metal, and welding. Emphasis is placed on mechanical and electrical systems, metal casting, and woodworking techniques to develop comprehensive technical skills and practical experience across multiple trades		
Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6
Unstructured SWL (h/sem)	57	Unstructured SWL (h/w)	4
Total SWL (h/sem)	150		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introduction - Difference the basic principles of the compression refrigeration cycle.		
Week 2	Learn about the types of furnaces for melting metals, and how to pour molten metal into sand molds.		
Week 3	Identify the tools used in the field of refrigeration and air-conditioning in general.		
Week 4	Identify the types of filings and their shapes		
Week 5	Training students on the operations carried out on pipes used in the field of refrigeration and air-conditioning.		
Week 6	Learn about all types of lathes and how to use them.		
Week7	Mid-term Exam		
Week 8	Learn how to deal with sheet metal.		
Week 9	Introducing students to the main parts that make up refrigeration and air-conditioning equipment of all kinds.		
Week 10	Learn about the most important methods of welding and the machines and tools needed for that.		
Week 11	Teaching students the basic operations of refrigeration and air-conditioning equipment.		
Week 12	Learn about the most important tools and machines for dealing with wood, in addition to identifying the most popular and common types of wood.		
Week 13	Teaching students about the electrical and mechanical parts of household refrigeration and air-conditioning devices.		
Week 14	Carrying out operations to find and repair leakages and charge gas for air-conditioning devices.		
Week 15	Conducting a practical exercise chosen by the course Lecturer as a test before the final exam		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Modern Refrigeration and Air-conditioning.	Yes	
Recommended Texts	Hand Book Of Air Condition and Refrigeration.	No	
Websites			

Module Information				
Module Title	Democracy and Human Rights		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	NTU 100			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery		
Administering Department	PM	College	TEMO	
Module Leader	Dr. Mohmmmed Abd Almojod	e-mail	dr.mohmmmed67@ntu.edu.iq	
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	6/10/2024	Version Number	1.0	
Relation with other Modules				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	
Module Aims, Learning Outcomes and Indicative Contents				
Module Objectives	1. Increase the student's knowledge of the theoretical conceptual aspect and historical development of the subject of human rights and democracy. 2. Develop the student's analytical and critical skills regarding the reality and future of human rights and democracy. 3. Train the student on the importance of active participation in aspects of public life such as enhancing respect for the principles of general human rights and active participation in political and cultural life. 4. Enabling students to understand the importance of education and its role in spreading the culture of human rights and democracy in building a civilized society based on good governance, the most important components of which are belief in human rights, education on them, and active participation in governance through free and fair elections			
Module Learning Outcomes	1. Human rights, their definition, their objectives 2. Human rights in contemporary and modern history 3. Regional recognition of human rights 4. Modern human rights 5. Guarantees of respect and protection of human rights at the national level 6. The term democracy			
Learning and Teaching Strategies				
Strategies				
Student Workload (SWL)				
Structured SWL (h/sem)	33	Structured SWL (h/w)		
Unstructured SWL (h/sem)	14	Unstructured SWL (h/w)		
Total SWL (h/sem)	50			
Delivery Plan (Weekly Syllabus)				

	Material Covered
Week 1	Human rights, their definition, their objectives
Week 2	Human rights in ancient civilizations, especially the civilization of Mesopotamia
Week 3	Human rights in divine laws with a focus on human rights in Islam
Week 4	Human rights in contemporary and modern history: International recognition of human rights since World War I and the League of Nations
Week 5	Regional recognition of human rights: European Convention on Human Rights 1950, American Convention on Human Rights 1969, African Charter on Human Rights 1981, Arab Charter on Human Rights 1994
Week 6	Modern human rights: facts in development, the right to a clean environment, the right to solidarity, the right to religion Human rights, national human rights organizations)
Week7	Human rights in Iraqi constitutions between theory and reality
Week 8	Mid-term Exam
Week 9	Economic, social and cultural human rights and civil and political human rights
Week 10	Modern human rights: facts in development, the right to a clean environment, the right to solidarity, the right to religion
Week 11	Guarantees of respect for and protection of human rights at the national level, guarantees in the constitution and laws
Week 12	Guarantees in constitutional oversight, guarantees in freedom of the press and public opinion, the role of non-governmental organizations in respecting and protecting rights Human
Week 13	Guarantees, respect and protection of human rights at the international level:
Week 14	The role of the United Nations and its specialized agencies in providing guarantees
Week 15	The role of regional organizations (the Arab League, the European Union, the African Union, the Organization of American States, the ASEAN Organization)
Week 16	Preparatory week before the final Exam
Learning and Teaching Resources	
	Text
Required Texts	Human Rights and Democracy by Dr. Muhammad Abd al-Jabri 2006
Recommended Texts	Human Rights and Democracy prepared by Asst. Prof. Dr. Ghassan Karim Mujthab and Asst. Prof. Amjad Zain al-Abidin Taama for the year 2018
Websites	"Methods, Education and Culture of Human Rights", published on the Internet at http://ghrorg-learning.blogspot.com

Module Information					
Module Title	English Language		Module Delivery		
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar		
Module Code	NTU 101				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		1	Semester of Delivery		1
Administering Department		PM	College	TEMO	
Module Leader	Sundus Falah Mohammed		e-mail	sundus.falah@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Lecturer	Module Leader's Qualification		M. Sc.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. To develop problem solving skills mainly speaking, reading, writing and listening skills and to understand the English language as a foreign language through the application of many techniques. 2. To understand the general principles of the English language. 3. This course deals with the basic concepts of learning the main rules of English grammar and English vocabularies. 4. This is the basic subject for writing and speaking English well. 5. To understand how to build a correct English sentence				
Module Learning Outcomes	1. To recognize how to use the main and auxiliary verbs in addition to the possessive pronouns. 2. To list the various words associated with questions and many subject pronouns. 3. To talk about social expressions and personal information mainly about jobs by using affirmative, negative and interrogative sentences. 4. To discuss how to use adjectives and their positions in the sentence. 5. To construct the simple present sentence by using I/ we/ you and they and to define the articles. 6. To describe the present simple tense with using he/ she and to discuss adverbs of frequency. 7. To identify the basic question words and demonstrative pronouns and their applications. 8. To discuss the use of there is/ are and many prepositions. 9. To discuss the structure of simple past sentences and various irregular verbs. 10. To explain the negative and interrogative structure of the simple past tense sentence in addition to the adverbs of the past tense. 11. To identify the use of many adverbs and the use of can/ can't in the sentence and to explain requests and offers. 12. To elaborate the use of like and would you like and the use of some and any in many expressions.				

	13. To discuss the use of the present continuous and the difference between present simple and present continuous sentences.		
	14. To explain the structures that are used to refer to future plants.		
Learning and Teaching Strategies			
Strategies	The main strategy that will be adopted in this module is associated with the communicative approach which will be applied to develop students' skills to learn English and to enable students to use English in communication, therefore, using authentic materials in the class is so necessary. This approach is important to encourage students’ participation in the class and to highlight their motivation in learning English, while at the same time refining and expanding their interactions and skills to achieve at least more success.		
Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
Total SWL (h/sem)	50		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Unit one: Hello Am/are/is. my/your This is with practice in work		
Week 2	Unit two: Your world He/she/they, his/her Questions		
Week 3	Unit three: All about you Personal information/ social expressions		
Week 4	Unit four: Family and friends Possessive adjectives/ possessive 's Have/has , adjective + noun		
Week 5	Unit five: The way i live Present simple I/we/you/they An/a , adjective + noun		
Week 6	Unit six: Every day		
Week7	Present simple he/she		
Week 8	Negatives and questions, adverbs of frequency		
Week 9	Unit seven: My favorites		
Week 10	Question words, pronouns, this/that		
Week 11	Unit eight: Where I live There is/ are, prepositions		
Week 12	Unit nine: Times past Was/ were born, past simple and irregular verbs		
Week 13	Unit ten: We had a great time		
Week 14	Past simple, regular and irregular		
Week 15	Questions, negatives, ago		
Week 16	Unit eleven: I can do that! Can/can't, adverbs, requests		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	John and liz Soar. (New Headway Beginner) 4th edition. Oxford: Oxford University Press.	Yes	
Recommended Texts	English Grammar in Use by Raymond Murphy	No	
Websites			

Module Information					
Module Title	Thermodynamics principle		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 103				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level		1	Semester of Delivery		2
Administering Department		PM	College	TEMO	
Module Leader	Mothana M. Mohamed Salih		e-mail	Muthanam.m1981@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Prof.	Module Leader's Qualification		M. Sc.
Module Tutor	Mothana M. Mohamed Salih		e-mail	Muthanam.m1981@ntu.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. To develop problem solving skills and understanding of thermodynamics theory through the application of techniques. 2. To understand thermodynamics and energy law. 3. This course deals with the basic concept of heat, work and energy. 4. This is the basic subject for all cases of systems used in thermodynamics. 5. To understand the laws of energy conversion between thermodynamics systems. 6. Introducing students to thermodynamics by studying thermal systems in terms of energy interactions with its immediate surroundings.				
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how temperature gauges work in laboratory equipment. 2. List the different thermodynamics terms. 3. Summarize what is meant by thermodynamics. 4. Discuss the reaction and participation of atoms in chemical reactions. 5. Describe thermal energy, work and energy. 6. Define Boyle's law. 7. Identify open and closed systems and their applications. 8. Discuss the heat transfer processes between thermal systems. 9. Discuss the different characteristics of the measuring devices used in the laboratory. 10. Explanation of Joule's law. 11. Identify the mathematical relationships in solving problems.				
Learning and Teaching Strategies					
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.				

Student Workload (SWL)			
Structured SWL (h/sem)	81	Structured SWL (h/w)	5
Unstructured SWL (h/sem)	119	Unstructured SWL (h/w)	8
Total SWL (h/sem)	200		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introductions, references, units, General notations, about pressure, force, work etc.		
Week 2	Temperature, unit of temperature and conversion, temperature measurements. Zeroth law of Thermodynamics. Energy, types of energy, positional, kinetic, internal and flow energy energies. Heat and work, power, enthalpy.		
Week 3	First law of thermodynamics		
Week 4	Steady flow energy equation for open system, non-flow energy equation for closed system, Ideal gas and equation of state		
Week 5	Ideal gas, Boyle’s law and Charles law and equation of state		
Week 6	Specific heat at constant pressure and constant volume, closed system Processes using ideal gas. Isometric and isobaric processes.		
Week7	Isothermal and adiabatic processes		
Week 8	Polytropic processes		
Week 9	open system processes		
Week 10	Vapor, phase of substance, Phase change curve on P-V diagram.		
Week 11	Dryness fraction, liquid and vapor lines, wet vapor		
Week 12	Steam tables and Examples on steam tables		
Week 13	Superheated vapor, tables of superheated tables.		
Week 14	Processes using two phase system, processes on P-V diagram, Irreversible processes Closed system		
Week 15	Second law of thermodynamics, heat engine, heat pump		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Thermal engineering (eighth edition) R. K. RAJPUT	Yes	
Recommended Texts	Fundamentals of heat and mass transfer (M. Thirumaleshwar)	No	
Websites			

Module Information				
Module Title	Computer		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	NTU 102			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	1	Semester of Delivery		2
Administering Department	PM	College	TEMO	
Module Leader	Luluwah abdulwahaab Yaseen	e-mail	luluwah.alhubaity@ntu.edu.iq	
Module Leader's Acad. Title	Assist. Lecturer	Module Leader's Qualification	M. Sc.	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	6/10/2024	Version Number	1.0	
Relation with other Modules				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	
Module Aims, Learning Outcomes and Indicative Contents				
Module Objectives	To learn about computers and their characteristics and features, compare different types of computers. 1. To learn about the computer's Hardware, Identify the factors that affect the computer's performance, Learn about the numerical systems and data representation. 2. Learn about the computer's Hardware (2), CPU, Memory 3. Learn about operating system software 4. Learn about the utility software programming languages, application software. 5. Learn the Microsoft office2020(Word, Excel, PowerPoint)			
Module Learning Outcomes	1. Demonstrates knowledge of the Introduction to computer, computer component (hardware, software) 2. Demonstrates knowledge of the Operating system (windows), 3. Able to install windows (formatting) 4. Able to use the following items: Start menu, desktop, taskbar, mouse applications, My computer, My documents, drivers, folders, files, cut, copy, paste, shortcut, right click menu, Setting menu, control panel 5. Able to use Microsoft word 2020, Microsoft excel 2020, Microsoft PowerPoint 2020 6. Able to use Internet , Internet explorer, starting, menus of internet explorer, E-Mail: Yahoo, Hotmail, google, yahoo, search information			
Learning and Teaching Strategies				
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.			
Student Workload (SWL)				

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	12	Unstructured SWL (h/w)	1
Total SWL (h/sem)	75		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Demonstrates knowledge of the Introduction to computer, computer component (hardware, software)		
Week 2	• Demonstrates knowledge of the Operating system (windows), • Able to install windows (formatting)		
Week 3	Able to use the following items: Start menu, desktop, taskbar, mouse applications, My computer, my documents, drivers, folders, files, cut, copy, paste, shortcut, right click menu, Setting menu, control panel		
Week 4	Able to use the following items: Start menu, desktop, taskbar, mouse applications, My computer, my documents, drivers, folders, files, cut, copy, paste, shortcut, right click menu, Setting menu, control panel		
Week 5	Able to use Microsoft word 2020		
Week 6	Able to use Microsoft word 2020		
Week7	Able to use Microsoft word 2020		
Week 8	Able to use Microsoft word 2020		
Week 9	Able to use Microsoft word 2020		
Week 10	Able to use Microsoft power point 2020		
Week 11	Able to use Microsoft power point 2020		
Week 12	Able to use Internet, Internet explorer, starting, menus of internet explorer		
Week 13	Able to create and use E-Mail: Yahoo, Hotmail		
Week 14	Able to utilize Search engines		
Week 15	Able to use google, yahoo, search information		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	1. Introduction to Computer Skills For first year students, Bisha University 2. Computer Science Principles: The Foundational Concepts of Computer Science - For AP® Computer Science Principles 2020th Edition , <u>Mr. Kevin P Hare</u> (Author), <u>Pindar Van Arman</u> (Foreword)	Yes	
Recommended Texts	Microsoft Access, Excel & Power Bi For Beginners & Power Users, Tech Demystified	No	
Websites	https://www.just.edu.jo/~mqais/CIS99/PDF/Ch.01_Introduction_%20to_computers.pdf		

Module Information						
Module Title	Arabic Language		Module Delivery			
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar			
Module Code	NTU 103					
ECTS Credits	2					
SWL (hr/sem)	50					
Module Level		1	Semester of Delivery		2	
Administering Department		PM	College	TEMO		
Module Leader		Dr. Eesha I. Mohammed		e-mail	aysha.ibrahim@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Prof.		Module Leader's Qualification		Ph.d
Module Tutor				e-mail		
Peer Reviewer Name				e-mail		
Scientific Committee Approval Date		6/10/2024		Version Number	1.0	
Relation with other Modules						
Prerequisite module		None			Semester	
Co-requisites module		None			Semester	
Module Aims, Learning Outcomes and Indicative Contents						
Module Objectives		ينشأ الطالب على حب اللغة العربية لغة القرآن الكريم. التعرف على مواطن الجمال في اللغة العربية وآدابها، وأن يكتسب الطالب القدرة على دراسة فروع اللغة العربية. تعريف الطالب بألفاظ اللغة العربية الصحيحة وتراكيبها وأساليبها السليمة بطريقة مشوقة وجذابة. أن يستغل الطالب وقت فراغه بالقراءة والاطلاع والرجوع إلى المكتبة. تمكين الطالب من القراءة الصحيحة، وأن يكتسب القدرة على استعمال اللغة استعمالاً صحيحاً في الاتصال مع الآخرين؛ كالسرعة وجودة الإلقاء وحسن التعبير، وتعويده حسن الاستماع لما يسمع مما يبسر له أموره ويعينه على قضاء حوائجه. تنمية الذوق الأدبي لدى الطالب حتى يدرك النواحي الجمالية في أساليب الكلام ومعانيه وصوره. تعويد الطالب التعبيرات السليمة الواضحة عن أفكاره وما يقع تحت حواسه نطقاً وكتابة وحسن استخدام علامات الترقيم. تنمية قدرة ومهارة الطالب الإملائية والخطية بحيث يستطيع الكتابة الصحيحة من جميع النواحي. إيقاظ وعي الطالب لإدراك شرف الكلمة وتوجيهه؛ للمحافظة على طهارتها ونقاها حتى لا تستعمل إلا في الخير. مساعدة الطالب على فهم التراكيب المعقدة والأساليب الغامضة.				
Module Learning Outcomes		١. معرفة القواعد النحوية والصرفية. ٢. التعريف بأبرز المصنفات اللغوية والأدبية. ٣. تحديد المشكلات اللغوية والأدبية لدى الدارسين. ٤. القراءة المعاصرة للنصوص اللغوية والأدبية. ٥. قراءة النصوص الأدبية وكتابتها وفق المعايير النحوية والصرفية ٦. تعزيز الثقة بالنفس والجرأة والفصاحة ٧. المنافسة والتميز في سوق العمل.				
Learning and Teaching Strategies						
Strategies		١. تبسيط المعلومات وتنظيمها ٢. تسهيل عملية استرجاع المعلومات ٣. ربط المفاهيم الجديدة بالمكتسبات السابقة ٤. إيجاد العلاقة بين المفاهيم ٥. تسهيل تذكر المعارف والمعلومات				
Student Workload (SWL)						
Structured SWL (h/sem)		48	Structured SWL (h/w)		3	
Unstructured SWL (h/sem)		2	Unstructured SWL (h/w)		0	

Total SWL (h/sem)		50
Delivery Plan (Weekly Syllabus)		
	Material Covered	
Week 1	مقدمة عن الأخطاء اللغوية	
Week 2	التاء المربوطة والتاء المفتوحة	
Week 3	همزة الوصل والقطع	
Week 4	الهمزة المتوسطة والمتطرفة	
Week 5	قواعد كتابة الالف الممدودة والمقصورة	
Week 6	الحروف الشمسية والقمرية	
Week7	الضاد والظاء	
Week 8	العدد	
Week 9	المفاعيل	
Week 10	أقسام الكلام	
Week 11	معاني حروف الجر	
Week 12	تطبيقات الأخطاء اللغوية الشائعة	
Week 13	النون والتنوين	
Week 14	مقدمة عن الأخطاء اللغوية	
Week 15	الأخطاء اللغوية	
Week 16	الامتحان النهائي	
Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	الكامل في اللغة والادب لابي عباس المبرد	Yes
Recommended Texts	أخطاء لغوية شائعة لخالد بن هلال بن ناصر العبري	No
Websites	https://www.eshamel.net https://www.ektebsa7.com	

Module Information					
Module Title	Engineering Mechanics / Dynamics			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	PM 104				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level		1	Semester of Delivery		2
Administering Department		PM	College	TEMO	
Module Leader	Tariq Khalid		e-mail	tariqaikhalidi@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Prof.	Module Leader's Qualification		M. Sc.
Module Tutor			e-mail		
Peer Reviewer Name		Ayman Sabah	e-mail	aymansabah@ntu.edu.iq	
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	Module Objectives for Engineering Mechanics/Dynamics: 1. Understand the fundamental concepts and principles of dynamics, including motion, forces, and acceleration. 2. Apply kinematic equations to analyze the motion of particles and rigid bodies in various scenarios. 3. Determine the relationship between forces, mass, and acceleration using Newton's laws of motion. 4. Apply the principles of work and energy to analyze and solve dynamic problems. 5. Analyze and calculate linear and angular momentum, and apply the principle of impulse and momentum to dynamic systems. 6. Understand and apply the principles of vibrations and oscillations in mechanical systems.				
Module Learning Outcomes	Module Learning Outcomes for Engineering Mechanics/Dynamics: 1. Demonstrate a thorough understanding of the fundamental concepts and principles of dynamics, including motion, forces, and acceleration. 2. Apply kinematic equations to analyze the motion of particles and rigid bodies in different scenarios and determine their velocities and accelerations. 3. Analyze and calculate the forces and moments acting on particles and rigid bodies in dynamic situations, considering the principles of equilibrium. 4. Apply Newton's laws of motion to determine the relationship between forces, mass, and acceleration, and solve dynamic problems using these principles. 5. Utilize the principles of work and energy to analyze and solve dynamic problems, calculating mechanical work, kinetic energy, and potential energy. 6. Apply the principles of impulse and momentum to analyze the motion and collision of particles and rigid bodies, and solve related problems				
Learning and Teaching Strategies					
Strategies	The main strategy for delivering this module is to actively engage students through problem-solving exercises, real-world applications, and interactive tutorials. Emphasis will be placed on developing critical thinking by analyzing				

	motion, forces, energy, and vibrations through practical demonstrations, simple experiments, and collaborative learning. Visual aids and simulations will support deeper understanding of dynamic mechanical systems and principles.		
Student Workload (SWL)			
Structured SWL (h/sem)	107	Structured SWL (h/w)	7
Unstructured SWL (h/sem)	93	Unstructured SWL (h/w)	6
Total SWL (h/sem)	200		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introduction to Engineering Mechanics/Dynamics • Overview of Engineering Mechanics/Dynamics • Fundamental concepts and principles • Unit conversions		
Week 2	Kinematics of Particles / Position, velocity, and acceleration		
Week 3	Rectilinear motion		
Week 4	Curvilinear motion		
Week 5	Tangential and normal components of acceleration		
Week 6	Projectile motion		
Week7	• Kinetics of Particles • Newton's laws of motion • Force, mass, and acceleration		
Week 8	Application of Newton's laws to particles		
Week 9	Frictional forces / Applications of particle kinetics		
Week 10	Kinetics of Rigid Bodies/ Moment of inertia		
Week 11	Work and Energy / Work done by a force		
Week 12	Kinetic energy and potential energy/ Principle of work and energy		
Week 13	• Impulse and Momentum/ Linear momentum and impulse/Conservation of linear momentum • Impulse-momentum principle /Impact and collision/Applications of momentum		
Week 14	Vibrations • Free and forced vibrations/ Single degree of freedom systems		
Week 15	Damping and damping ratios/Natural frequency and resonance/Vibration isolation and control		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Engineering Mechanics, Statics and Dynamics Twelfth Edition R. C. Hibbeler	Yes	
Recommended Texts	Theory and Problems of Engineering Mechanics Statics and Dynamics/ Fifth Edition, Shaum's Outline	No	
Websites			

Module Information				
Module Title	Engineering Drawing		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	PM 105			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level		1	Semester of Delivery	
Administering Department		PM	College	TEMO
Module Leader	Shaima Salim Younus		e-mail	Shaima.salem@ntu.edu.iq
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification	
			M. Sc.	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date		6/10/2024	Version Number	1.0
Relation with other Modules				
Prerequisite module	None			Semester
Co-requisites module	None			Semester
Module Aims, Learning Outcomes and Indicative Contents				
Module Objectives	Introduction students to the AutoCAD software. 1. Introduction to the students of engineering drawings. 2. Teaching students to draw geometrically according to accurate measurements. 3. To understand the basic principle for descriptive geometry. 4. to train students: to read the engineering drawings through the application of computers and techniques. 5. To understand standard specifications, draw simple and complex assembly drawings.			
Module Learning Outcomes	Enables the students to use AutoCAD for 2-D representations. 1. Enables the students to Introduce the students to engineering drawings. 2. Enables the students to learn the techniques and standard practices of technical graphics. 3. To develop the student's abilities of engineering imagination. 4. To develop the student's engineering sense by dealing with dimensions and measurements. 5. To teach the student to identify the characteristics of geometric shapes and the various ways to draw them. 6. To teach the student diversity in the way of thinking and finding solutions for drawing each form.			
Learning and Teaching Strategies				
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students. Group discussions, real-world problem applications, and the integration of visual demonstrations will further support concept retention and student motivation.			
Student Workload (SWL)				

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	112	Unstructured SWL (h/w)	7
Total SWL (h/sem)	175		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Demonstrates knowledge about: • Introduction to engineering drawing. • Introduction about AutoCAD 2D software in engineering drawing. Limits, grid, object snap, view menu (zoom, pan).		
Week 2	Correctly draw menu (line, poly line, polygon, rectangle, arc, circle, point, text).		
Week 3	Correctly draw menu (line, poly line, polygon, rectangle, arc, circle, point, text).		
Week 4	Correctly modify menu (erase, copy, mirror, offset, move, rotate, trim, extend, explode).		
Week 5	Correctly modify menu (erase, copy, mirror, offset, move, rotate, trim, extend, explode).		
Week 6	Complex geometrical shape.		
Week7	Complex geometrical shape.		
Week 8	Complex geometrical shape.		
Week 9	Mid Semester exam		
Week 10	Perspective		
Week 11	Perspective		
Week 12	Perspective		
Week 13	Correctly implement and identify orthographic projection. Correctly implement and execute first and third angle projection method		
Week 14	Correctly draw the projection with the first angle projection method Correctly draw the projection with the third angle projection method		
Week 15	Demonstrates knowledge and implementation about drawing the three projections with the first and third angle projection method		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Fundamentals and principles of engineering drawing	Yes	
Recommended Texts	Fundamentals of AutoCAD2020	No	
Websites			

Module Information					
Module Title	Occupational Safety		Module Delivery		
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 106				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		1	Semester of Delivery		2
Administering Department		PM	College	TEMO	
Module Leader	Banan Najim Al-deen Abdullah		e-mail	Banan.najim@ntu.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		M. Sc.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	Understanding the Importance of Occupational Safety: This unit aims to provide students with a comprehensive understanding of the importance of occupational safety in the workplace. Students will identify potential hazards associated with various industries and their impact on employee safety. They will understand the importance of following safety guidelines to create a safe work environment. They will learn how to identify potential hazards, assess their severity and likelihood of occurrence, and develop appropriate control measures to mitigate or eliminate those hazards.				
Module Learning Outcomes	1. Identify and assess workplace hazards: Engineering students will be able to identify and assess potential workplace hazards specific to their field of engineering. They will understand the importance of hazard identification and risk assessment in order to prevent accidents, injuries, and occupational illnesses. 2. Apply engineering principles to develop safety solutions: Students will be able to apply their engineering knowledge and skills to develop innovative and effective safety solutions. They will understand how engineering principles can be utilized to design and implement engineering controls, safety devices, and protective measures to minimize or eliminate workplace hazards. 3. Implement safety standards and regulations: Engineering students will be knowledgeable about relevant safety standards and regulations applicable to their specific engineering discipline. They will understand the importance of compliance with safety standards and be able to apply them in the design, construction, operation, and maintenance of engineering systems and processes. They will also be aware of the legal and ethical responsibilities associated with ensuring occupational safety in their professional practice.				
Learning and Teaching Strategies					
Strategies	1. Familiarize yourself with the subject				

	2. Collaborate and discuss: Engage in discussions and group activities with fellow engineering students. Share experiences, exchange ideas, and learn from each other's perspectives. This collaborative learning environment can broaden your understanding and provide different insights into safety practices. 3. Stay updated with industry standards: Keep yourself informed about the latest safety regulations, codes, and standards relevant to the engineering field. Regularly refer to authoritative sources such as government agencies, professional organizations, and reputable publications to stay up-to-date with best practices.
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Student Workload (SWL)

Structured SWL (h/sem)	32	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	18	Unstructured SWL (h/w)	1
Total SWL (h/sem)	50		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	مقدمة في السلامة المهنية
Week 2	تحديد المخاطر وتقييم المخاطر
Week 3	وسائل السيطرة الهندسية وأنظمة السلامة
Week 4	معدات الحماية الشخصية ومعدات السلامة
Week 5	الصحة المهنية والصحة الصناعية
Week 6	سلامة الحرائق والاستعداد للطوارئ
Week 7	سلامة الكهرباء في الهندسة
Week 8	سلامة الآلات والمعدات
Week 9	سلامة البناء في مشاريع الهندسة
Week 10	إدارة المواد الخطرة
Week 11	التدريب والتواصل في سلامة الهندسة
Week 12	تحقيق الحوادث وتقاريرها في الهندسة
Week 13	أنظمة إدارة السلامة في الهندسة
Week 14	تطبيق في السلامة المهنية ١
Week 15	تطبيق في السلامة المهنية ٢
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	للمؤلف علي عبد العزيز المرزوقي. السلامة والصحة المهنية	Yes
Recommended Texts		
Websites	web.archive.org/web/20180626230747/https://www.cdc.gov/niosh/topics/machine/	

Module Information					
Module Title	Refrigeration & Air Conditioning Principles		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 200				
ECTS Credits	8				
SWL (hr/sem)	180				
Module Level		2	Semester of Delivery		1
Administering Department		PM	College	TEMO	
Module Leader	Husam Naufal Saleh Yassien		e-mail	husam.naufal@ntu.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		M. Sc.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. Understand the basic principles of refrigeration and air conditioning systems. 2. To understand the fundamental properties of Air and Water vapor mixture. 3. This course deals with the basic concept of air-conditioning processes. 4. Identify and describe the components of a typical refrigeration and air conditioning system. 5. To explain the thermodynamic principles involved in refrigeration and air conditioning processes. 6. Demonstrate knowledge of refrigerants and their properties, including safety considerations and environmental impacts.				
Module Learning Outcomes	1. Define Refrigeration and Air conditioning and identify their applications. 2. Define and calculate moist air properties using related equations. 3. Recognize how to use a Psychrometric chart in solving various Air conditioning processes. 4. Analyze the simple vapor compression cycle. 5. Describe the factors affecting vapor compression cycle performance. 6. Identify the multi pressure Refrigeration systems. 7. Recognize the refrigerant types and their effect on Ozone and How to Number it.				
Learning and Teaching Strategies					
Strategies	The Refrigeration and Air Conditioning module employs a range of effective learning and teaching strategies. Students engage in theoretical lectures, practical demonstrations, and hands-on laboratory sessions to grasp the underlying principles and gain practical skills. Case studies and real-world scenarios enhance problem-solving abilities, while group projects foster teamwork and communication skills. Continuous assessment methods, including assignments and practical assessments, ensure students' progress and understanding of the subject matter. The module promotes equipping students with the knowledge and skills necessary for success in the field of refrigeration and air conditioning.				

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6
Unstructured SWL (h/sem)	107	Unstructured SWL (h/w)	7
Total SWL (h/sem)	200		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Air-conditioning, Air-conditioning systems, SI units, Fundamental properties of Air and Water vapour mixture; definition of (moist air properties) , Dry bulb, wet bulb and Dew point temperatures, partial pressure, Relative humidity, moisture content, Specific volume and Enthalpy.		
Week 2	The General Gas Law, Dalton's law of partial pressure, Calculation of moist air properties using related equations.		
Week 3	Psychrometric chart, Construction of psychrometric chart, Sensible Heat and Latent Heat.		
Week 4	Air-conditioning processes, Adiabatic saturation process, sensible cooling, and sensible heating.		
Week 5	Dehumidification; by pass factor, contact factor, Humidification – Humidification by water injection, steam injection.		
Week 6	Mixing of air streams, Cooling and dehumidification with reheat.		
Week 7	Preheating with humidification and reheat. Summer and winter cycle.		
Week 8	Refrigeration application, refrigeration theory, heat pump, reversed Carnot cycle.		
Week 9	Simple vapour compression cycle, vapour compression cycle components, Simple vapour compression cycle analysis.		
Week 10	Ideal and actual vapour compression cycle, factors affecting vapour compression cycle performance (effect of suction temperature, effect of condensing temperature, effect of subcooling, effect of superheating, effect of pressure loss).		
Week 11	Multi Pressure systems: Removing of flash gas, inter-cooler.		
Week 12	Single evaporator and single compressor, single compressor and two evaporators.		
Week 13	Two compressors and two evaporators, multi-stage compression cycle using, water intercooler, flash intercooler, liquid refrigerants intercooler.		
Week 14	Refrigerants, types of old and new refrigerant. Effect of refrigerant on Ozone, secondary refrigerants.		
Week 15	Numbering of Refrigerants.		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Refrigeration & Air Conditioning, W.F. Stoecker & J.W Jones, Second Edition, McGraw-Hill, Inc.	Yes	
Recommended Texts	Air Conditioning Engineering , W.P. Jones, Fifth Edition Elsevier Butterworth-Heinemann	No	
Websites	https://www.ashrae.org/technical-resources/ashrae-handbook		

Module Information					
Module Title	Fluid Mechanics		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 201				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level		2	Semester of Delivery		1
Administering Department		PM	College	TEMO	
Module Leader	Noor Moneer Basher		e-mail	noorabasher@ntu.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		M. Sc.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. To understand the properties of fluids, dimensions and units. 2. To derive the equation of conservation of mass, momentum, energy and its application. 3. To use important concepts of continuity equation, Bernoulli's equation and turbulence, and apply the same to problems. 4. To understand the various flow measuring devices. 5. To understand the classification of flows: Steady, unsteady, uniform, non-uniform, laminar, turbulent.				
Module Learning Outcomes	1. Understand how to convert the unit system from British to SI. unit or vice versa. 2. Training the students how to solve the problems associated with fluid mechanics. 3. Measure the fluid flow of liquids by different types of flow meters. 4. Analyze the magnitude of the horizontal and vertical components of the force of the water on the gate. 5. Determine the reading on the pressure gauge by the different types of manometers. 6. Draw simple hydraulic and energy gradient lines. 7. Solve the formulas of open channel flow.				
Learning and Teaching Strategies					
Strategies	The teaching of fluid mechanics will utilize a combination of interactive lectures, problem-solving sessions, and hands-on laboratory experiments. Conceptual understanding will be strengthened through the use of real-life engineering examples and fluid simulation tools. Students will engage in collaborative group work and guided tutorials to develop critical thinking and analytical skills. Visual aids, animations, and demonstration videos will support diverse learning styles. Regular quizzes and feedback sessions will help monitor progress and reinforce key concepts effectively.				

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	6
Unstructured SWL (h/sem)	107	Unstructured SWL (h/w)	7
Total SWL (h/sem)	200		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introduction - Units system		
Week 2	Physical properties of fluids.		
Week 3	Physical properties of fluids.		
Week 4	Fluid pressure at static.		
Week 5	Fluid pressure instruments.		
Week 6	Hydrostatic force on a plane surface.		
Week7	Hydrostatic force on an inclined surface		
Week 8	Hydrostatic force on a curved surface.		
Week 9	Fluid dynamics / classifications of fluids.		
Week 10	Conservation of mass.		
Week 11	Conservation of momentum and its application.		
Week 12	Conservation of energy- Bernoulli equation.		
Week 13	Bernoulli equation applications.		
Week 14	Viscous flow in pipes.		
Week 15	Pumps or turbines.		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	A Textbook Of Fluid Mechanics And Hydraulic Machines By Rajput.	Yes	
Recommended Texts	Fluid Mechanics by Yunus A. Cengel, John M. Cimbala.	No	
Websites			

Module Information				
Module Title	Mathematics		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	TECM 200			
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level	2	Semester of Delivery		1
Administering Department	PM	College	TEMO	
Module Leader	Ahmed Mustaffa Saleem		e-mail	ahmedmustafa@ntu.edu.iq
Module Leader's Acad. Title	Assist. Prof.		Module Leader's Qualification	M. Sc.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	6/10/2024		Version Number	1.0
Relation with other Modules				
Prerequisite module	None			Semester
Co-requisites module	None			Semester
Module Aims, Learning Outcomes and Indicative Contents				
Module Objectives	Mathematics provides a powerful and universal language. Students are expected to use appropriate mathematical language and different forms of representation when communicating mathematical ideas, reasoning and findings, both orally and in writing. In order to reach the aims of mathematics, students should be able to: 1. use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations. 2. use appropriate forms of mathematical representation to present information. 3. move between different forms of mathematical representation. 4. communicate complete, coherent and concise mathematical lines of reasoning. 5. organizes information using a logical structure.			
Module Learning Outcomes	1. Students are able to appreciate the importance of understanding the structure of algebra to a higher-level concept. 2. Students can create awareness, especially symbolic thinking within the framework of the theory of modules. 3. Students have the capability to use its understanding and analyzing models of mathematics, science and technology and other disciplines related fields. 4. Students are able to develop an understanding framework that supports science and technology, and mathematics as well as communicate the results of the development of oral and written comprehension.			
Learning and Teaching Strategies				
Strategies	Teaching and learning strategies can include a range of whole class, group and individual activities to accommodate different abilities, skills, learning rates and styles that allow every student to participate and to achieve some degree of success.			
Student Workload (SWL)				
Structured SWL (h/sem)	93	Structured SWL (h/w)	6	

Unstructured SWL (h/sem)	107	Unstructured SWL (h/w)	7
Total SWL (h/sem)	200		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Review in differential and integration		
Week 2	Vectors: general introduction to vectors in space – equation of straight line and an equation for a plane in space – plane, tangent and perpendicular line – vector function		
Week 3	Complex numbers – polar form – Euler equation – exponential and roots of complex numbers – composite functions – Cauchy-Riemann equation		
Week 4	Two and more variable equations – partial derivative		
Week 5	Chain rule for partial derivative – gradient and directional derivative – maximum and minimum values for two variable functions		
Week 6	Double integral, areas and volumes – physical applications		
Week 7	Triple integral		
Week 8	Polar coordinates – cylindrical and spherical coordinates – curve drawing in polar coordinates		
Week 9	Green's theorem - divergence theorem		
Week 10	The linear integration		
Week 11	The Series: sequences of numbers – limits – infinite series – limit by definition - alternating series test - power series - converges interval		
Week 12	Taylor/Maclaurin series for a function – general applications		
Week 13	Matrices: introduction and Basic Operations		
Week 14	Inverse of a Matrix (system of linear equations) – solution of equations by matrices		
Week 15	Solution of Differential Equations		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	" Calculus " , Ford , S.R. and Ford , J.R. , (1963) McGraw-Hill	Yes	
Recommended Texts	“Advanced Engineering Mathematics”, Erwin Kreyszig et al., (2006)	No	
Websites	https://library.oapen.org/bitstream/handle/20.500.12657/31235/633792.pdf?sequence=1&isAllowed=y		

Module Information					
Module Title	Mechanical Drawing		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 202				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		2	Semester of Delivery		1
Administering Department		PM	College	TEMO	
Module Leader	Asmaa taha Hussein		e-mail	Asmaa.taha@ntu.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		M. Sc.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	6
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. to train students: to read the technical drawings through the application of techniques. 2. Learn students to read symbols, technical terms, standard specifications. 3. To understand basic principle for the descriptive geometry. 4. This course deals with the basic concept of the computer in mechanical drawing. 5. To be able to communicate with manufacturers of mechanical systems. 6. To understand standard specifications, draw the simple and complex assembly drawings. 7. To be able to communicate with other mechanical engineering professionals regardless their spoken language.				
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Capability to use AutoCAD for 2-D representations. 2. To make the students understanding all about the screw threads and their definitions also to teach the students all common types for screw threads and the common types for bolts and nuts with over view in details. 3. To make the students understanding all about the Keys, types of keys, spline shaft and hub concept, and the basic definitions for Keys also the correct manner for Keys drawing. 4. Enables the students to learn the techniques and standard practices of technical graphics. 5. To make the students understanding all about the riveting and types of rivets. 6. Read a working or assembly drawing (blueprint) 7. Represent mechanical components in multi view orthographic representation 8. understanding all about welding, types of weld joints and the basic definitions for welding also the correct manner for all types of welding symbol.				

	9. To help students understanding all about the Gears classification, draw spur gear, definitions, formulas and calculations.		
Learning and Teaching Strategies			
Strategies	The teaching of mechanical drawing will be conducted through a combination of theoretical instruction and practical application. Lectures will introduce drawing principles, standards, and conventions, while hands-on sessions will develop students' skills in manual and computer-aided drafting (CAD). Students will practice creating 2D and simple 3D mechanical drawings with emphasis on accuracy and clarity. Interactive tutorials, peer evaluations, and regular feedback will reinforce learning. The use of real engineering examples and drawing assignments will enhance spatial visualization and technical communication skills.		
Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	37	Unstructured SWL (h/w)	2
Total SWL (h/sem)	100		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introduction to (CAD), components of computer aided drawing (CAD), Exercises		
Week 2	Screw threads, forms of screw thread, international metric threads (ISO screw), Common types of fasteners.		
Week 3	Method of drawing (Hexagonal & Square headed bolts and nuts)		
Week 4	Keys, types of keys.		
Week 5	Pins and Cotters.		
Week 6	Rivets and riveted joints.		
Week7	Types of riveted joints, Conventional rivet symbol, working drawing.		
Week 8	Welding, type of weld joints, welding symbols standard, location and dimension of weld.		
Week 9	Pulleys, types of pulleys.		
Week 10	Gears classification of gears, spur gear, definitions, formulas and calculations.		
Week 11	Gear tooth profile, working drawing.		
Week 12	Assembly and details of common mechanical unit. Screw Jack (Assembly and details).		
Week 13	Power screw (Assemble and details)		
Week 14	Coupling, Types of coupling, Bearings, types of bearings.		
Week 15	Pipes and pipe joints, piping fittings, pipe symbols standard.		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	k. l. Narayana p. kannaiiah k. venketa reddy mechanical engineering.	Yes	
Recommended Texts	Up.and.Running.with.AutoCAD.2012.2D.and.3D.Drawi ng.and.Modeling	No	
Websites	https://learnengineering.in/mechanical-drawing-books/		

Module Information					
Module Title	Baath's Crimes in Iraq			Module Delivery	
Module Type	Basic			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	NTU 200				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		1	Semester of Delivery		1
Administering Department		PM	College	TEMO	
Module Leader	Abdulkareem Ataya		e-mail	ABDZuhair93@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Lecturer	Module Leader's Qualification		M. Sc.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. The course aims for the student to be knowledgeable about the crimes committed by the Ba'ath regime in Iraq. 2. To provide students with a comprehensive understanding of the political and historical background of the Ba'ath regime in Iraq. 3. To examine the nature, scope, and impact of the crimes committed by the regime against individuals and communities. 4. To develop students' ability to critically assess sources and narratives related to the regime's human rights violations. 5. To foster awareness of justice, accountability, and transitional justice mechanisms.				
Module Learning Outcomes	By the end of this module, students will be able to: 1. Identify key historical events and crimes committed by the Ba'ath regime in Iraq, including their political, social, and humanitarian impacts. 2. Analyze the legal and ethical dimensions of the Ba'ath regime's actions within the framework of international human rights laws. 3. Evaluate primary and secondary sources related to the regime's practices, including testimonies, official documents, and scholarly research. 4. Discuss the long-term consequences of authoritarian rule on Iraqi society, institutions, and individual freedoms. 5. Apply critical thinking to compare the Ba'ath regime's practices with those of other authoritarian regimes in modern history.				
Learning and Teaching Strategies					
Strategies	This module will use a combination of lectures, guided discussions, and case studies to explore the crimes of the Ba'ath regime. Students will engage with historical documents, survivor testimonies, and multimedia resources to deepen understanding. Critical thinking exercises, group presentations, and reflective writing will be used to encourage analysis and personal engagement. Field visits, guest speakers, and debates may be integrated to connect theory with lived experiences and historical context.				

Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
Total SWL (h/sem)	50		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introduction to the Ba'ath Party and Its Rise to Power in Iraq		
Week 2	Political Context of Iraq Before and During the Ba'ath Regime		
Week 3	Overview of Human Rights Violations Under Ba'ath Rule		
Week 4	Genocide		
Week 5	Political Context of Iraq Before and During the Ba'ath Regime		
Week 6	Education and Cultural Policies Under the Ba'ath Regime		
Week7	The Role of Intelligence and Security Services in Repression		
Week 8	Impact of Ba'ath Policies on Iraqi Society and Minorities		
Week 9	Forced Displacement and Population Control Strategies		
Week 10	Media Censorship and Propaganda Under the Ba'ath Regime		
Week 11	Economic Exploitation and Corruption in Ba'ath Iraq		
Week 12	International Response and Sanctions Against the Ba'ath Regime		
Week 13	The Fall of the Ba'ath Regime: Causes and Consequences		
Week 14	Role of NGOs and Human Rights Organizations in Iraq		
Week 15	The Impact of Ba'ath Rule on Iraq’s Legal and Judicial Systems		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Baath's Crimes in Iraq	Yes	
Recommended Texts		No	
Websites	https://iraqicenter-fdec.org/archives/5146		

Module Information					
Module Title	Strength of Materials		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 203				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		2	Semester of Delivery		2
Administering Department		PM	College	TEMO	
Module Leader	Hussein Mohammed Ali		e-mail	alabadi.hussein@ntu.edu.iq	
Module Leader's Acad. Title		Prof.	Module Leader's Qualification		Ph.d
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. To know different types of the stresses which may subjected to the mechanical elements and their expected effects such as strain. 2. To study the shear forces and bending moment diagrams with essential stresses				
Module Learning Outcomes	Students who successfully complete this course will have demonstrated an ability to: 1. Understand the concepts of stress and strain at a point as well as the stress-strain relationships for homogenous, isotropic materials. 2. Calculate the stresses and strains in axially-loaded members, circular torsion members, and members subject to flexural loadings. 3. Calculate the stresses and strains associated with thin-wall spherical and cylindrical pressure vessels. 4. Determine the stresses and strains in members subjected to combined loading and apply the theories of failure for static loading. 5. Determine and illustrate principal stresses, maximum shearing stress, and the stresses acting on a structural member. 6. Determine the deflections and rotations produced by the three fundamental types of loads: axial, torsional, and flexural. 7. Analyze slender, long columns subjected to axial loads. 8. Design simple bars, beams, and circular shafts for allowable stresses and loads.				
Learning and Teaching Strategies					
Strategies	This module uses lectures, problem-solving sessions, and lab experiments to teach material behavior under loads. Students apply theory through computer simulations and real-world examples. Group discussions and case studies develop critical thinking, while quizzes and assignments track progress. This approach ensures a strong grasp of both concepts and practical skills essential for mechanical engineering.				

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	6
Total SWL (h/sem)	150		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Simple stress		
Week 2	Shearing stress, Bearing stress		
Week 3	Thin wall cylinders		
Week 4	Simple strain, stress-strain diagram, Hook’s law		
Week 5	Thermal stress		
Week 6	Welded connection		
Week7	Riveted joints		
Week 8	Torsion		
Week 9	Spring		
Week 10	Shear and moment in Beam		
Week 11	Beam deflection		
Week 12	Deflection cantilever Beam		
Week 13	Deflection of simply supported Beam		
Week 14	Combined stresses		
Week 15	Stress at a point /Mohr circle		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Strength of Materials, Ferdinand L. Singer and Andrew Pytel.	Yes	
Recommended Texts	Schaum's Outline of Strength of Materials	No	
Websites	https://www.coursera.org/learn/mechanics-1		

Module Information					
Module Title	Engineering Materials		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PM 204				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		2	Semester of Delivery		2
Administering Department		PM	College	TEMO	
Module Leader	Dr. Jamal. N. Sultan		e-mail	Jamal.nayyef@ntu.edu.iq	
Module Leader's Acad. Title		Prof.	Module Leader's Qualification		Ph.d
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. Understand the Structure of Materials: Learn about the atomic and molecular structure of materials, including the arrangement of atoms, crystal structures, and the relationship between structure and material properties. 2. Study Material Properties: Explore the various physical and mechanical properties of materials such as strength, hardness, elasticity, conductivity, thermal expansion, and corrosion resistance. 3. Learn about Material Processing: Gain knowledge about different manufacturing and processing techniques used to modify the structure and properties of materials. This may include topics such as casting, forging, welding, heat treatment, and surface treatment.				
Module Learning Outcomes	1. Knowledge of Material Properties: Students should gain a comprehensive understanding of the fundamental properties of different engineering materials such as metals, polymers, ceramics, and composites. This includes knowledge of mechanical properties (strength, stiffness, toughness), thermal properties (conductivity, expansion), electrical properties, corrosion resistance, and other relevant characteristics. 2. Material Selection and Application: Students should learn how to select appropriate materials for specific engineering applications based on their properties, performance requirements, and cost considerations. 3. Material Processing and Manufacturing: Students should acquire knowledge of different material processing and manufacturing techniques, including casting, forming, machining, welding, heat treatment, and surface treatment.				
Learning and Teaching Strategies					
Strategies	1. Active Learning: Engage students in hands-on activities, experiments, and projects that involve working with engineering materials. This could include laboratory sessions, case studies, or design projects that require students to apply their knowledge to real-world problems. 2. Visualization Tools: Utilize visualization tools such as diagrams, models, and simulations to help students understand the structure, properties, and behavior of different engineering materials. This can enhance their conceptual				

	understanding and make complex concepts more accessible.		
	3. Practical Examples: Provide practical examples of engineering materials used in real-world applications. Showcase the materials' properties and performance in various industries.		
Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	6
Total SWL (h/sem)	150		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introduction to Engineering Materials: Importance of materials in engineering./ Classification and properties of materials. Structure of materials: atomic, crystalline, and non-crystalline materials. FCC, BCC, CPH structures.		
Week 2	Atom binding: Ionic bond, covalent bond, metallic bond, Van der Waals forces.		
Week 3	Crystalline defects: dislocations, types of dislocations		
Week 4	Phase Diagrams and Phase Transformations: -Phase equilibrium and phase diagrams./ Solidification, different crystals form in an ingot, castings defects./ Heat treatment processes (e.g., annealing, quenching, tempering).		
Week 5	Mechanical Properties of Materials: Stress and strain.-/ Elasticity and plasticity./ Tensile, compressive, and shear behavior. -Hardness, toughness, and impact resistance.		
Week 6	Metals and Alloys: Strengthening mechanisms: solid solution, precipitation, and dispersion strengthening. Ferrous and non-ferrous metals and alloys./Corrosion and oxidation of metals.		
Week7	Creep test.		
Week 8	Fatigue test.		
Week 9	Iron-making and steel making.		
Week 10	Thermal equilibrium diagram for Iron-iron carbide.		
Week 11	Types of steels: carbon steel, alloy steel.		
Week 12	Nanomaterials and nanotechnology./ Biomaterials and medical applications.		
Week 13	Ceramics: Structure and properties of ceramics./Types of ceramics: oxides, non-oxides, composites. Ceramic processing techniques./Applications and limitations of ceramics.		
Week 14	Polymers and Composite Materials		
Week 15	Material Selection and Design:		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	"Materials Science and Engineering: An Introduction" by William D. Callister Jr. and David G. Rethwisch.	Yes	
Recommended Texts	"Introduction to Materials Science for Engineers" by James F. Shackelford.	No	
Websites	American Ceramic Society (ACerS) - The ACerS website (www.ceramics.org)		

Module Information					
Module Title	Thermodynamics		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar		
Module Code	PM 205				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		2	Semester of Delivery		2
Administering Department		PM	College	TEMO	
Module Leader	Anwar Ahmed Yousif		e-mail	nawarayousif@ntu.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		M.Sc
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	1. The aim is to enhance problem-solving abilities and gain a comprehensive comprehension of thermodynamics theory by utilizing various methodologies. 2. The objective is to grasp the principles of thermodynamics and the laws governing energy. 3. The course primarily focuses on the fundamental notions of heat, work, and energy. 4. This subject serves as a foundational component for understanding different systems employed in thermodynamics. 5. The goal is to comprehend the principles that govern the conversion of energy between different thermodynamic systems.				
Module Learning Outcomes	1. Classify and define various terms related to thermodynamics. 2. Provide a concise explanation of the concept of thermodynamics. 3. Analyze the involvement and behavior of atoms in chemical reactions. 4. Explain the concepts of thermal energy, work, and energy in the context of thermodynamics. 5. Define Boyle's law and understand its significance in thermodynamics. 6. Differentiate between open and closed systems and comprehend their respective applications. 7. Explore the processes of heat transfer between thermal systems.				
Learning and Teaching Strategies					
Strategies	Thermodynamics is taught through a combination of lectures, problem-solving sessions, and interactive discussions to build a strong theoretical foundation. Students engage in tutorials and practical experiments to apply laws of thermodynamics to real systems. Visual aids, simulation tools, and real-life engineering examples enhance understanding. Regular assessments, group work, and feedback help reinforce concepts and encourage active learning.				
Student Workload (SWL)					
Structured SWL (h/sem)		93	Structured SWL (h/w)		6

Unstructured SWL (h/sem)	82	Unstructured SWL (h/w)	5
Total SWL (h/sem)	175		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Introduction to Thermodynamics; Overview, system, surroundings, boundary, properties		
Week 2	First Law of Thermodynamics; Energy transfer and work, Heat transfer and thermal energy, Conservation of energy principle		
Week 3	Second Law of Thermodynamics; Heat engines and refrigerators, Carnot cycle and efficiency, Entropy and its significance		
Week 4	Entropy and its Applications; Calculation of entropy changes, Entropy generation and irreversibility, Entropy balance in thermodynamic processes		
Week 5	Properties of Pure Substances; Equations of state, Phase diagrams and phase equilibrium, Ideal gas behavior		
Week 6	Vapor and Gas Power Cycles; Rankine cycle, Brayton cycle, Combined cycles		
Week7	Refrigeration and Heat Pump Systems; Vapor compression refrigeration, Absorption refrigeration, Coefficient of Performance (COP)		
Week 8	Thermodynamic Property Relations; Maxwell's equations, Departure functions, Compressibility factor		
Week 9	Mixtures and Psychrometrics; Properties of mixtures, Psychrometric properties and processes, Air conditioning and humidity control		
Week 10	Chemical Reactions and Thermodynamics; Enthalpy of reactions, Gibbs free energy and chemical equilibrium, Chemical equilibrium constant		
Week 11	Exergy and Second Law Analysis; Exergy analysis and applications, Availability and irreversibility, Second law efficiency		
Week 12	Power and Refrigeration Cycles; Gas power cycles (Otto, Diesel, and more), Refrigeration cycles (Cascade, Multi-stage, etc.)		
Week 13	Introduction to Heat Transfer; Modes of heat transfer (conduction, convection, radiation), Fourier's law, Newton's law of cooling, Stefan-Boltzmann law		
Week 14	Heat Exchangers; Types of heat exchangers, Effectiveness-NTU method, Heat exchanger design and analysis		
Week 15	Review and Applications; Review of key concepts and principles, Applications of thermodynamics in various industries, Final exam preparation		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Thermodynamics: An Engineering Approach" by Yunus A. Çengel and Michael A. Boles	Yes	
Recommended Texts	Fundamentals of Engineering Thermodynamics" by Michael J. Moran, Howard N. Shapiro	No	
Websites	(https://www.khanacademy.org/science/physics/thermodynamics) (https://ocw.mit.edu/courses/chemistry/5-60-thermodynamics-kinetics-spring-2008/)		

Module Information					
Module Title	Electrical Machines			Module Delivery	
Module Type	Basic			☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	PM 206				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		2	Semester of Delivery		2
Administering Department		PM	College	TEMO	
Module Leader	Safwan Assaf Hamoodi		e-mail	Safwan79azb@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Prof.	Module Leader's Qualification		M. Sc.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		6/10/2024	Version Number	1.0	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					
Module Objectives	- Building a foundation for studying electrical calculations in both AC and DC circuits, and familiarizing students with the various theories used in these calculations. - Gaining a comprehensive understanding of electrical principles and concepts, such as voltage, current, resistance, and power. This knowledge will be applied to the analysis of electrical circuits and systems. - Applying the acquired knowledge to the operation and maintenance of electrical machines, including motors and generators. Students will also explore the fundamentals of power systems, including power generation, transmission, and distribution.				
Module Learning Outcomes	- Mastery of electrical circuit theory: Students will acquire a comprehensive understanding of the fundamental principles of electrical circuit theory, encompassing key concepts such as voltage, current, resistance, and power. They will be proficient in applying this knowledge to analyze and solve basic electrical circuits. - Application of electrical machines and power systems: Students will explore the principles and workings of electrical machines, including motors and generators, gaining insight into their applications and performance characteristics. Additionally, they will develop a foundational understanding of power systems, encompassing power generation, transmission, and distribution aspects, enabling them to comprehend the broader context of electrical engineering.				
Learning and Teaching Strategies					
Strategies	- Active Participation: Actively participate in class discussions to engage with the subject matter and deepen your understanding. - Problem-Solving Skills: Develop and enhance your problem-solving skills, as they are essential in Electrical and Electronic Engineering. - Practical Application: Gain hands-on experience through laboratory sessions and projects, allowing you to apply theoretical concepts to real-world scenarios.				

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	75	Unstructured SWL (h/w)	5
Total SWL (h/sem)	150		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	D.C motors, construction, commutator, types of D.C motors		
Week 2	Back e.m.f, speed equation, speed control		
Week 3	Load Toque Requirement, types Load Torque		
Week 4	Starting of D.C motor, starter connection, torque of D.C motors		
Week 5	Speed-torque characteristics of each type of D.C motor		
Week 6	Examples to evaluate the starting current of D.C motor with and without starter, speed control		
Week7	Single phase induction motor, split-phase, capacitor-start, shaded-pole type		
Week 8	3-phase induction motor, construction, synch. Speed, slip.		
Week 9	Control of three-phase induction motor using voltage frequency control.		
Week 10	Starting of 3-phase induction motor, star-delta method, step down transformer		
Week 11	Torque characteristic, max torque		
Week 12	3-phase system, star and delta connection, line current, line voltage, phase current and voltage		
Week 13	Instruments and measurements, ammeters, voltmeter, ohmmeter, kw - h meters.		
Week 14	Contactors, relays, timers		
Week 15	Thermal overload, starter (contactor +timer)		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	1. Electric Machinery and Power System Fundamentals" by Stephen J. Chapman 2. Principles of Electric Machines and Power Electronics" by P.C. Sen	Yes	
Recommended Texts	1. Electrical Wiring Residential by Ray C. Mullin and Phil Simmons 2. Electrical Safety Handbook by John Cadick, Mary Capelli - Schellpfeffer, and Dennis Neitzel	No	
Websites	(www.allaboutcircuits.com) (www.electrical4u.com)		

Module Information						
Module Title	Arabic Language		Module Delivery			
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar			
Module Code	NTU 203					
ECTS Credits	2					
SWL (hr/sem)	50					
Module Level		2	Semester of Delivery		2	
Administering Department		PM	College	TEMO		
Module Leader		Dr. Eesha I. Mohammed		e-mail	aysha.ibrahim@ntu.edu.iq	
Module Leader's Acad. Title		Assist. Prof.		Module Leader's Qualification		Ph.d
Module Tutor				e-mail		
Peer Reviewer Name				e-mail		
Scientific Committee Approval Date		6/10/2024		Version Number	1.0	
Relation with other Modules						
Prerequisite module		None		Semester		
Co-requisites module		None		Semester		
Module Aims, Learning Outcomes and Indicative Contents						
Module Objectives		١. ينشأ الطالب على حب اللغة العربية لغة القرآن الكريم. ٢. التعرف على مواطن الجمال في اللغة العربية وآدابها، ٣. وأن يكتسب الطالب القدرة على دراسة فروع اللغة العربية. ٤. تعريف الطالب بألفاظ اللغة العربية الصحيحة وتراكيبها وأساليبها السليمة بطريقة مشوقة وجذابة. ٥. أن يستغل الطالب وقت فراغه بالقراءة والاطلاع والرجوع إلى المكتبة . ٦. تمكين الطالب من القراءة الصحيحة، وأن يكتسب القدرة على استعمال اللغة استعمالاً صحيحاً في الاتصال مع الآخرين؛ كالسرعة وجودة الإلقاء وحسن التعبير، وتعويد حسن الاستماع لما يسمع مما ييسر له أموره ويعينه على قضاء حوائجه. ٧. تنمية الذوق الأدبي لدى الطالب حتى يدرك النواحي الجمالية في أساليب الكلام ومعانيه وصوره. تعويد الطالب التعبيرات السليمة الواضحة عن أفكاره وما يقع تحت حواسه نطقاً وكتابة وحسن استخدام علامات الترقيم. ٨. تنمية قدرة ومهارة الطالب الإملائية والخطية بحيث يستطيع الكتابة الصحيحة من جميع النواحي. إيقاظ وعي الطالب لإدراك شرف الكلمة وتوجيهه؛ للمحافظة على طهارتها ونقاها حتى لا تستعمل إلا في الخير. ٩. مساعدة الطالب على فهم التراكيب المعقدة والأساليب الغامضة				
Module Learning Outcomes		١. معرفة القواعد النحوية والصرفية. ٢. التعرف بأبرز المصنفات اللغوية والأدبية. ٣. تحديد المشكلات اللغوية والأدبية لدى الدارسين. ٤. القراءة المعاصرة للنصوص اللغوية والأدبية. ٥. قراءة النصوص الأدبية وكتابتها وفق المعايير النحوية والصرفية ٦. تعزيز الثقة بالنفس والجرأة والفصاحة ٧. المنافسة والتميز في سوق العمل.				
Learning and Teaching Strategies						
Strategies		١. تبسيط المعلومات وتنظيمها. ٢. تسهيل عملية استرجاع المعلومات. ٣. ربط المفاهيم الجديدة بالمكتسبات السابقة				

٤. إيجاد العلاقة بين المفاهيم.
٥. تسهيل تذكر المعارف والمعلومات

Student Workload (SWL)

Structured SWL (h/sem)	33	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
Total SWL (h/sem)	50		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	ان وأخواتها
Week 2	كان واخواتها
Week 3	الاستثناء
Week 4	أدوات النصب
Week 5	أدوات الجزم
Week 6	أنواع الأفعال وطرق اعرابها
Week 7	النعت وانواعه
Week 8	نائب فاعل
Week 9	كيفية التخلص من الأخطاء
Week 10	الاستفهام
Week 11	لغة الضاد
Week 12	المبتدأ والخبر
Week 13	التقديم والتأخير
Week 14	الأسماء الموصولة
Week 15	كيفية كتابة الطلب وإجابة الكتب الواردة
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	الكامل في اللغة والادب لابي عباس المبرد	Yes
Recommended Texts	كتاب النحو الواضح في قواعد اللغة العربية، لعلي الجارم ومصطفى أمين	No
Websites	https://www.eshamel.ne https://shamela.ws/book/10018	

Module Information				
Module Title	Computer		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	NTU 202			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	2	Semester of Delivery		2
Administering Department	PM	College	TEMO	
Module Leader	Safa Akram Younis		e-mail	safa.altutunji@ntu.edu.iq
Module Leader's Acad. Title	Assist. Lecturer		Module Leader's Qualification	M. Sc.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	6/10/2024		Version Number	1.0
Relation with other Modules				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	
Module Aims, Learning Outcomes and Indicative Contents				
Module Objectives	The goal of teaching the subject of communications is to provide students with a fundamental understanding of how information is transmitted and received over various media. It aims to: 1. Introduce basic concepts such as signals, modulation, bandwidth, and noise. 2. Explain communication systems, including analog and digital transmission. 3. Develop problem-solving skills in analyzing and designing communication circuits and systems. 4. Prepare students for advanced topics like wireless communication, data networks, and information theory. 5. Enhance practical skills through lab work and simulations involving real world communication technologies. Overall, the course equips students with the theoretical and practical knowledge needed for careers in telecommunications, electronics, and networking.			
Module Learning Outcomes	1. Understand the Fundamentals of Communication: Describe the basic principles, types, and models of communication. Explain the components and processes of effective communication. 2. Apply Verbal and Non-verbal Communication Skills: Demonstrate effective speaking, listening, and presentation techniques. Interpret and use body language, tone, and other non-verbal cues appropriately. Communicate Effectively in Various Contexts: Adapt communication styles to suit academic, professional, and intercultural settings. 3. Utilize Modern Communication Technologies: Use digital tools (e.g., email, social media, video conferencing) for clear and professional communication. Analyze the impact of technology on modern communication practices. 4. Develop Critical Thinking and Message Analysis Skills: Evaluate the credibility and effectiveness of messages in media and interpersonal contexts.			

	5. Resolve Communication Barriers and Conflicts: Identify common communication barriers and propose solutions.		
Learning and Teaching Strategies			
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.		
Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	12	Unstructured SWL (h/w)	1
Total SWL (h/sem)	75		
Delivery Plan (Weekly Syllabus)			
	Material Covered		
Week 1	Security and Networking: What is a network? Types of networks. Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting		
Week 2	E-Commerce: Concepts of Electronic banking services this include online banking: ATM and debit card services, Phone banking. SMS banking, electronic alert, Mobile banking		
Week 3	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter		
Week 4	Basic troubleshooting techniques and tools for diagnosing and resolving issues.		
Week 5	Introduction to AI		
Week 6	Definition of AI, History of AI, AI Techniques and Approaches, Challenges and Ethical Considerations		
Week7	AI in Our Daily Lives: AI in smartphones and virtual assistants like Siri or Google Assistant.		
Week 8	AI in Our Daily Lives: AI in smartphones and virtual assistants like Siri or Google Assistant.		
Week 9	AI in Our Daily Lives: AI in smartphones and virtual assistants like Siri or Google Assistant.		
Week 10	Applications of AI: Education, Healthcare, Transportation, Marketing and Advertising.		
Week 11	Applications of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising.		
Week 12	AI and Society: (How AI affects social, AI and international relations, AI and the future of humanity.		
Week 13	surveillance, the impact of AI on the job market		
Week 14	surveillance, the impact of AI on the job market		
Week 15	The Future of AI (Future trends in AI, recent research and emerging technologies.)		
Week 16	Preparatory week before the final Exam		
Learning and Teaching Resources			
	Text	Available in the Library?	
Required Texts	Introduction to Computer Skills For first year students, Bisha University	Yes	
Recommended Texts	Graham Brown, David Watson, "Cambridge IGCSE Information and Communication Technology", 3rd Edition		
Websites	https://www.iust.edu.jo/~mqais/CIS99/PDF/Ch.01 Introduction %20to compers.pdf		