MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Workshops (I)**	**Module Delivery**	
Module Type	**BASIC**	☐ Theory	
Module Code	ATU21011	☐ Lecture	
		☐ Lab	
ECTS Credits	4	☐ Tutorial	
SWL (hr/sem)	**100**	☒ Practical	
		☐ Seminar	
Module Level	UG I	**Semester of Delivery**	1
Administering Department	MET	**College**	TCM
Module Leader	Salam Obaid Dhahi	**e-mail**	salam.obaid@atu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc
Module Tutor	Hani Mizhir Majid	**e-mail**	hani.magid@atu.edu.iq
Peer Reviewer Name	Mohammed A. K	**e-mail**	almuntadher@atu.edu.iq
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals of material science and properties of materials used in engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Proficiency in various welding techniques to produce high-quality welds on different materials and thicknesses. 2- Adherence to safety protocols, industry standards, and welding-related hazard awareness. 3- Interpretation of technical drawings, blueprints, and welding symbols for accurate execution of welding tasks. 4- Selection and utilization of mechanical fittings for proper installation and assembly. 5- Proficiency in pipefitting techniques, including measuring, cutting, threading, and alignment. 6- Compliance with industry standards and practices for mechanical fitting installation. 7- Fundamental knowledge and practical skills in machining operations, such as milling, drilling, and turning. 8- Use of appropriate tools and equipment to produce accurate and precise components. 9- Adherence to technical specifications and industry standards in machining processes.
Indicative Contents المحتويات الإرشادية	1. Demonstrate proficiency in various welding techniques, such as shielded metal arc welding (SMAW), gas metal arc welding (GMAW), and gas tungsten arc welding (GTAW), to produce high-quality welds on different materials and thicknesses. 2. Apply appropriate safety protocols and adhere to industry standards when operating welding equipment, including proper use of personal protective equipment (PPE), fire prevention measures, and knowledge of welding-related hazards. 3. Understand and interpret technical drawings, blueprints, and welding symbols to accurately execute welding tasks and meet specifications. 4. Develop skills in selecting and utilizing mechanical fittings, including threaded fittings, flanges, couplings, and valves, for various industrial applications, ensuring proper installation and assembly. 5. Demonstrate proficiency in pipefitting techniques, including measuring, cutting, threading, and aligning pipes, to effectively install mechanical fittings in compliance with industry standards. 6. Acquire fundamental knowledge and practical skills in machining operations, such as milling, drilling, and turning, including the use of appropriate tools and equipment, to produce accurate and precise components based on technical specifications.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	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)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	10	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	1	20% (10)	Continuous	All
	Assignments	4	40% (10)	Continuous	All
	Projects / Lab.	1	20% (10)	Continuous	All
	Report	1	20% (10)	Continuous	All
Summative assessment	**Midterm Exam**	0	-	-	
	Final Exam	0	-	-	
Total assessment		100% (100 Marks)			

Delivery Plan (Weekly Workshop Syllabus)
المنهاج الاسبوعي للورش الهندسية

	Material Covered
Week 1-3	welding workshop
Week 4-6	Grinding (abrasive cutting) Workshop
Week 7-9	Casting Workshop
Week 10-12	Carpentry Workshop
Week 13-15	Drilling Workshop

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الورش الهندسية عملي للمراحل الأولية في كلية الهندسة وكلية العمليات النفطية /قسم هندسة تكرير النفط والغاز تأليف: عبد فارس علي العزاوي	yes
Recommended Texts	Mechanical Workshop Practice: K. C. John	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Engineering Materials		Module Delivery	
Module Type	BASIC		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21012			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UG I	Semester of Delivery		1
Administering Department	MET	College	TCM	
Module Leader	Shaymaa Abdul Khader	e-mail	ShaimaaAl-jumaili@atu.edu.iq	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		M.Sc.
Module Tutor	Hani Mizhir Majid	e-mail	hani.magid@atu.edu.iq	
Peer Reviewer Name	Mohammed A. K	e-mail	almuntadher@atu.edu.iq	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals of material science and properties of materials used in engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introduction to materials science and engineering. 2. Recognize the Atomic structure and interatomic bonding. 3. Defines Crystal and amorphous structures in materials. 4. Classify Imperfections in solids. 5. Define Thermally activated processes and diffusion in solids. 6. Classify Mechanical properties of metals. 7. Sketch Phase diagrams and transformations. 8. Defines Engineering alloys. 9. Recognize Polymeric materials. 10. Classify Ceramics and composite materials.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduction to Materials and Crystal Structure: • Understand the concepts of ores, elements, and engineering materials. • Identify and classify engineering materials. • Explain crystal structures and the imperfections in crystals, including point defects, dislocations, and grain boundaries. • Describe the solidification process of metals and alloys and the structure of ingots. 2. Phase Diagrams and Solid Solutions: • Interpret thermal equilibrium diagrams and understand solubility in the solid state. • Identify phases, solid solutions, compounds, and mechanical mixtures in materials. • Apply the lever rule to analyze eutectic, eutectoid, and peritectic reactions in binary phase diagrams. 3. Mechanical Testing and Properties of Metals: • Understand mechanical properties of metals, including normal and shear stress, strain, and tensile and compression tests. • Analyze stress-strain diagrams and interpret hardness tests (Brinell, Rockwell, and Vickers) and impact tests (Izod and Charpy). • Apply mechanical testing to determine Young's modulus, yield stress, ultimate tensile strength, fracture stress, ductility, hardness, and impact toughness. • Explain non-destructive inspection techniques such as liquid penetrant, magnetic particle, X-rays, and ultrasonic testing. 4. Iron and Steel, Heat Treatment: • Describe the properties and characteristics of carbon steel, cast iron, and alloy steel. • Understand the principles and methods of heat treatment for steel. 5. Metals and Alloys:

- Study the properties and applications of copper and its alloys, as well as aluminum and its alloys.
6. Nano Materials:
- Explore the basics of nanomaterials, their properties, and applications.
7. Plastics:
- Gain an understanding of plastics technology, including microstructure, polymerization, and structure of plastic materials.
- Classify plastics based on their properties and uses.
8. Ceramics and Glass:
- Describe the structure, defects, properties, and uses of ceramics.
- Explore the structure, properties, and uses of glass materials.
9. Composite Materials:
- Classify composite materials based on matrix type (metal, ceramic, polymer) and reinforcing phase (fibers, flakes, particles).
- Understand the composite structure, volume fraction, properties, and applications.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	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)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #8, #9
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to ores, elements and materials, Iron ores, Periodic table of elements, Engineering materials.
Week 2	Classification of engineering materials + Crystal structure
Week 3	Imperfections in crystals, point defects, Dislocations and grain boundaries, Solidification of metals and alloys + Structure of ingots chilled
Week 4	Thermal equilibrium diagrams, Solubility in the solid state, Phases, Solid solutions, compounds and mechanical mixtures. + Lever rule (Eutectic, Eutectoid and Peritectic reactions).
Week 5	Applications on binary phase diagrams (Components completely soluble, completely insoluble or partially soluble in the solid state).
Week 6	Mechanical properties of metals (Specifications and standards, Normal stress and shear stress, Strain, Tensile and compression tests - Stress-strain diagram, Hardness tests: Brinell, Rockwell and Vickers, Impact tests: Izod and Charpy)
Week 7	Mid-term Exam + Application on mechanical testing and properties (Determination of Young's modulus, Yield stress)
Week 8	Application on mechanical testing and properties (Proof stress, Ultimate tensile strength, Fracture stress, ductility, Hardness and impact toughness) + Non- destructive inspection (Liquid penetrant, Magnetic particle, X-rays, Ultrasonic).

Week 9	Iron and Steel (carbon steel, cast Iron, alloy steel)
Week 10	Heat treatment of steel
Week 11	Metals Alloys (Copper and its alloys, Aluminum and its alloys)
Week 12	Nano materials
Week 13	Plastics (Introduction to plastics technology, Microstructure and polymerization, Structure of plastics materials, Classification, properties and uses of plastics)
Week 14	Ceramics and glass (Structure, defects, properties and uses of ceramics, Structure, properties and uses of glasses)
Week 15	Composite Materials (Classification: metal matrix, ceramic matrix and polymer matrix composites, reinforcing phase: fibers, flakes, and particles, Composites structure and volume fraction, Properties and uses of composites)
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Sample preparations
Week 2	Lab 2: Tensile Test
Week 3	Lab 3: Impact tests: Izod and Charpy
Week 4	Lab 4: Hardness tests: Brinell
Week 5	Lab 5: Hardness tests: Rockwell
Week 6	Lab 6: Hardness tests: Vickers
Week 7	Lab 7: Shear Test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Callister, W., Materials Science and Engineering: An Introduction, Wiley, 2006.	Yes
Recommended Texts	Mechanical Behaviour of Engineering Materials (Metals, Ceramics, Polymers, and Composites)	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

| Grading Scheme |||||
| مخطط الدرجات |||||
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Engineering Mechanics (I)**	**Module Delivery**	
Module Type	Core	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21014		
ECTS Credits	8		
SWL (hr/sem)	**200**		
Module Level	UG I	**Semester of Delivery**	1
Administering Department	MET	**College**	TCM
Module Leader	Kussay Ahmed Subhi	**e-mail**	kussaysubhi@atu.edu.iq
Module Leader's Acad. Title	Asist. Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor	Badr Kamoon Dabis	**e-mail**	com.bdr@atu.edu.iq
Peer Reviewer Name	Mohammed A. K	**e-mail**	almuntadher@atu.edu.iq
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	To teach the fundamentals of the study of the effects of forces acting on bodies (objects).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this course, students will be able to understand and apply the principles of Engineering Mechanics. 1. Understand the fundamental concepts: Students will grasp the basic principles of Engineering Mechanics, including concepts such as force, moment, equilibrium, and motion. 2. Analyze static systems: Students will be able to analyze and solve problems related to static equilibrium, including the calculation of forces and moments acting on a body. 3. Calculate internal forces: Students will be able to determine internal forces, such as axial forces, in structural members using methods like the method of sections or the moment distribution method. 4. Apply engineering mechanics principles to real-world problems: Students will develop the skills to apply the principles of Engineering Mechanics to solve real-world engineering problems, such as analyzing the stability of structures, designing mechanical systems, and predicting the behavior of mechanical components. 5. Analyze equilibrium: Students will be able to determine the equilibrium conditions of a system 6. Calculate forces and moments: Students will be able to calculate the forces, moments, and reactions in various structural elements such as trusses, beams, and frames. 7. Understand the including both concurrent and non-concurrent force systems. 8. Analyze mechanical systems: Students will be able to analyze and solve problems related to equilibrium of mechanical systems, including simple machines. 9. Solve problems using vector analysis: Students will be able to solve engineering mechanics problems using vector analysis techniques, including the addition and resolution of forces and moments. 10. Understand the friction and rope friction. 11. Understand the analysis of pin jointed plane frames (Method of Section) and (Method of Joints). 12. Understand the centroid of a section and center of gravity. 13. Understand the moment of inertia of area.
Indicative Contents	Indicative content includes the following.

المحتويات الإرشادية	Part A – Introduction to Analyze Mechanical Systems (Static):

Part A – Introduction to Analyze Mechanical Systems (Static):

1. **Introduction to Statics:**
   - Definition and importance of statics in engineering
   - Types of forces and moments
   - Concept of equilibrium
   - [4 hrs]

2. **Forces and Equilibrium:**
   - Scalar and vector quantities
   - Resultant and component forces
   - Free body diagrams
   - Equilibrium equations (sum of forces and sum of moments)
   - [6 hrs]

3. **Analysis of Trusses:**
   - Definition and characteristics of trusses
   - Method of joints and method of sections
   - Analysis of simple truss structures
   - Determination of member forces and reactions
   - [8 hrs]

4. **Frames and Machines:**
   - Classification and analysis of frames
   - Types of machines (simple, compound, and complex)
   - Analysis of machines using equilibrium equations
   - Calculation of support reactions and member forces
   - [6 hrs]

5. **Friction:**
   - Introduction to friction and its types
   - Laws of friction (Coulomb's laws)
   - Static and kinetic friction
   - Frictional forces in equilibrium analysis
   - [8 hrs]

6. **Moments and Couples:**
   - Definition and properties of moments and couples
   - Calculation of moments and couples
   - Equivalent systems of forces and moments
   - Couples and their effects on rigid bodies
   - [8 hrs]

7. **Center of Gravity and Centroids:**
   - Definition and calculation of center of gravity
   - Determination of centroids of simple geometric shapes
   - Composite bodies and determination of centroids
   - Applications of centroids in equilibrium analysis
   - [8 hrs]

8. **Structural Analysis:**
   - Introduction to structural analysis
   - Determination of support reactions
   - Analysis of determinate structures (beams and frames)

	• Calculation of internal forces (shear forces and bending moments) • [8 hrs]	
	9. Moment of inertia [4 hrs]	
	Part B – Engineering Mechanic Lab: [30 hrs]	
	Part C – Engineering Mechanic Tutorial: [15 hrs]	

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	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)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	4, 7, 12 and 14	LO #2, #3 and #8, #12
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All

	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #9
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	GENERAL PRINCIPLES OF STATIC.
Week 2	VECTOR QUANTITIES & FORCE ANALYSIS.
Week 3	MOMENT OF AFORCE.
Week 4	COUPLE
Week 5	FORCE SYSTEM RESULTANTS.
Week 6	FORCE SYSTEM RESULTANTS.
Week 7	**Mid-Term** + EQUILIBRIUM OF FORCE SYSTEM.
Week 8	EQUILIBRIUM OF FORCE SYSTEM.
Week 9	EQUILIBRIUM OF ARIGID BODY.
Week 10	FRICTION.
Week 11	FRICTION.
Week 12	CENTER OF GRAVITY AND CENTROID.
Week 13	CENTER OF GRAVITY AND CENTROID.
Week 14	PRINCIPLES OF WORK.
Week 15	MOMENT OF INERTIA.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1-3	Lab 1: Introduction to Forces and vectors
Week 4-5	Lab 2: Forces in 3D Applications
Week 6-7	Lab 3: Moments and couples Applications
Week 8-9	Lab 4: Resultant and Equilibrium
Week 10-11	Lab 5: Joint Method and section method
Week 12-13	Lab 6: Trusses in 3D
Week 14-15	Lab 7: Frames and Machines

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	[R.C._Hibbeler] Engineering_Mechanic_STATICS 2017	Yes
Recommended Texts	Meriam Kraige, Engineering Mechanics Statics	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Drawing**		**Module Delivery**		
Module Type	BASIC		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ATU21015				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	UG I		**Semester of Delivery**		1
Administering Department	MET		**College**	TCM	
Module Leader	Mohammed A. K		**e-mail**	almuntadher@atu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**		P.hd
Module Tutor	Mohammed A. K		**e-mail**	almuntadher@atu.edu.iq	
Peer Reviewer Name	Hani Mizhir Majid		**e-mail**	hani.magid@atu.edu.iq	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals concepts of engineering drawing and its importance in engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The main goals of studying engineering drawing are as follows: 1. To understand the importance of engineering drawing in engineering application 2. To know engineering operations 3. To draw 2D shapes on the board 4. To draw 3D shapes on the board 5. Drawing projections of 3D shapes on the board 6. To know the basic concepts and drawing tools of the AutoCAD program 7. To draw 2D, 3D geometric shapes and projections using AutoCAD program
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Introduction to engineering drawing and eng. drawing equipment, Lettering, Applied geometry, Pictorial drawing (Real model in true dimension), Exercise in pictorial drawing, Exercise in pictorial drawing, Orthographic projection , First angle projection, Dimensions, Rules in dimension position for arcs and circles, Exercise in applied dimension on projection view, Exercise in projection, Exercise in projection, Mid-term Exam, Sections, Third view estimate, Exercise in estimate third unknown projection, Exercise in estimate third unknown projection, Exercise in estimate third unknown projection, Exercise in estimate third unknown projection. [36 hrs] Part B – Introduction to CAD packages, Drawing area, Coordinate system (absolute and relative Coordinate).[hrs]

Learning and Teaching Strategies	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	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)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #8, #9
	Assignments	4	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	-	-		
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction to engineering drawing and eng. drawing equipment** - Introduction to engineering drawing and its importance to the engineer - History of eng. drawing - The standard drawing equipment **Lettering** - The lettering and circles kind - The paper type and design with title table - Draw eng. Lines type and circles
Week 2	**Applied geometry** - Applied geometry in eng. Drawing

	- Draw important eng. Geometry
	- Exercise in engineering geometry
	- Exercise in engineering geometry
Week 3	**Pictorial drawing (Real model in true dimension)**
	- Draw cube shape with ovals by used four center method. - Non standard letters
	- **Exercise in pictorial drawing**
Week 4	- **Exercise in pictorial drawing**
	Orthographic projection
	- Projection theory with definition standard planes (Horizontal and Vertical)
	- Exercise in projection
Week 5	**First angle projection**
	- Three projection definition (front, top and side view)
	- Draw in first angle
	- Exercise in projection
	Dimensions
	- Main rules in dimensions position and
	details in drawing
	- Exercise in applied dimension on projection view
Week 6	- **Rules in dimension position for arcs and circles**
	- **Exercise in applied dimension on projection view**
Week 7	**Mid-term Exam + Exercise in projection , - Exercise in projection**
Week 8	**Sections**
	- Sections definition
	- Find sections and section planes and half section projection
	- Exercise in sections
	- Exercise in sections
	- Exercise in sections
Week 9	- Exercise in sections
	- Exercise in sections
Week 10	**Third view estimate**
	- Important steps to estimate third unknown projection depending on the known two projection
	- Estimate real model
	- Exercise in estimate third unknown projection
Week 11	- Exercise in estimate third unknown projection

	- Exercise in estimate third unknown projection
Week 12	**- Exercise in estimate third unknown projection** **- Exercise in estimate third unknown projection**
Week 13	**CAD I** **Introduction to CAD packages** - Menus - Tool bars **Drawing area** - Command window / Command line - Status bar
Week 14	**Coordinate system (absolute and relative Coordinate)** - Cartesian - Cylindrical - Spherical - Setting up drawing limits **Two dimensional drawing** - Drawing bar (line, circle, rectangle, …etc) - Modify bar (erase, copy, mirror,…etc
Week 15	**Drawing aids** - Grid - Snap mode - Object snap - Object snap tracking - Orthogonal mode - Polar tracking
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	كتاب الرسم الهندسي - عبد الرسول الخفاف	yes
Recommended Texts	Design Handbook: Engineering Drawing and Sketching	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English (I)	**Module Delivery**	
Module Type	Support	☒ Theory ☐Lecture ☐ lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21016		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		
Module Level	UG I	**Semester of Delivery**	1
Administering Department	MET	**College**	TCM
Module Leader	Salam Obaid Dhahi	**e-mail**	Salam.obaid@atu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	Shaymaa Abdul Khader	**e-mail**	ShaimaaAl-jumaili@atu.edu.iq
Peer Reviewer Name	Mohammed A. K	**e-mail**	almuntadher@atu.edu.iq
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Teaching the student, the basic principle of English Language. 2. Teaching students the exits of letters. 3. Teach the student the basic rules of the subject .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Listening, Question, Cities and Countries, Numbers, Reading, Every Day English . 2. The Family, Possessives, Possessives Adjectives Vocabulary, Listening, Reading, Everyday English. 3. Sport, Food and Drinks, Present Simples, Number and Price, Listening. 4. Questions, Pronouns and Possessives. 5. Prepositions, Everyday English, Past Simple Irregular Verbs,. 6. Times Past, Reading, Past Simple- Regular, Everyday English, Vocabulary, Grammar,. 7. Present Continuous, Present Simple and Continuous, Reading, Opposite Verbs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Introduction , Listening, Question, Cities and Countries, Numbers, Reading, Every Day English, Jobs, Question and Negatives, Address, Phone Remember, Listening, Pronunciation, Listening, Everyday English, Sport, Food and Drinks, Present Simples, Number and Price, Listening, Object Pronouns, Questions Words, Why and Because, Vocabulary, Reading, Writing, Everyday English. Part B - Prepositions, Everyday English, Past Simple Irregular Verbs, Times Past, Reading, Past Simple- Regular, Everyday English, Vocabulary, Grammar, Past Simple, Making Conversation, Time Expression, Reading, Everyday English, Present Continuous, Present Simple and Continuous, Reading, Opposite Verbs.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	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

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	18	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	-	-	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	Basics of Present simple tense
Week 3	Spelling of –S and –ES and Exercises.
Week 4	**Present continuous tense** and Exercises.
Week 5	**Spelling of –ing and Spelling of –ed.**
Week 6	**Past simple tense and Exercises.**
Week 7	Mid-term Exam
Week 8	**Past continuous tense and Exercises.**
Week 9	EXPRESSIONS OF QUANTITY.

Week 10	Present perfect tense
Week 11	COMPARE THE PAST SIMPLE AND PRESENT PERFECT
Week 12	Verb Patterns
Week 13	The Second Conditional
Week 14	Past Perfect Tense
Week 15	Present Perfect Continuous
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Headway**	Yes
Recommended Texts		
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A - Excellent**	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX – Fail**	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	**Mathematics (I)**	**Module Delivery**
Module Type	**Basic**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	ATU21013	
ECTS Credits	**6**	
SWL (hr/sem)	**150**	

Module Level	UG I	**Semester of Delivery**		1
Administering Department	MET	**College**	TCM	
Module Leader	Hanen Hamid Oda	**e-mail**	haneen.aoda@atu.edu.iq	
Module Leader's Acad. Title	Asist. Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Badr Kamoon Dabis	**e-mail**	com.bdr@atu.edu.iq	
Peer Reviewer Name	Mohammed A. K	**e-mail**	almuntadher@atu.edu.iq	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The aim of this course is to give an introductory course on basics of analysis, to teach general concepts such as Slopes, Limits, Continuity, Matrix, solving equations, complex number, Logarithmic, Exponential and Hyperbolic functions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define basic functions, take the limit of functions and investigate their continuity, 2. sketch and interpret the graph of functions. 3. Define Matrices and vectors. 4. classify Determinants and Properties 5. Solving of system of Equations 6. Defines complex numbers 7. Knowing the mathematical operations of complex numbers. 8. Define the main functions and theorem (Demaiver's, Trigonometric, Logarithmic and exponential functions, Hyperbolic).
Indicative Contents المحتويات الإرشادية	1. General Concepts, Slope, Cartesian Coordinates, Slope of a line, Equations, and Distances: • Understand and apply the concepts of slope and Cartesian coordinates. • Calculate and interpret the slope of a line using the rise over run formula. • Solve equations involving slopes and distances on the coordinate plane. 2. Graphing of Functions, Limits, Graphs of Equations, Limits, and Intervals: • Graph functions and equations on a coordinate plane. • Understand the concept of limits and calculate limits of functions. • Determine the intervals of continuity and analyze the behavior of functions within those intervals. 3. Matrices, Elementary Operations with Matrices, and Vectors: • Understand the properties and operations of matrices. • Perform elementary operations on matrices, including addition, subtraction, scalar multiplication, and matrix multiplication. • Apply vector concepts and operations, such as addition, subtraction, and scalar multiplication. 4. Determinants and Properties, Transpose, and Inverse of Matrices: • Calculate determinants of matrices and understand their properties. • Find the transpose and inverse of matrices. • Apply properties of determinants and matrix operations to solve mathematical problems. 5. Solution of System of Equations using Gramer's Rule Method: • Understand and apply Gramer's Rule for solving systems of equations. • Solve systems of equations using determinants and Cramer's Rule. • Apply the solution to real-world problems involving systems of equations. 6. Complex Numbers, Mathematical Operations, Argand Diagrams, and Product Quotients: • Understand the concept of complex numbers and their representation.

	• Perform mathematical operations, including addition, subtraction, multiplication, and division, with complex numbers. • Interpret and construct Argand diagrams to represent complex numbers. • Apply complex number operations to solve mathematical problems.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	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)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #2 and #6
	Assignments	2	10% (10)	3 and 8	
	Projects / Lab.	1	10% (10)		
	Report	0	0% (10)		
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	General Concepts, Slope, Cartesian Coordinates, Slope of a line, Equations and distances
Week 2	Graphing of functions, Limits, Graphs of equations, Limits and intervals
Week 3	Continuity, Domain and Range, Continuity test
Week 4	Matrices, Elementary Operations with matrices and Vectors
Week 5	Determinants and Properties, Transpose and inverse of matrices
Week 6	Solution of System of Equations (Solution of system of equations using Gramer's rule method)
Week 7	Mid-term Exam
Week 8	Complex Numbers Introduction to complex numbers
Week 9	Mathematical Operations for Complex Numbers, Argand diagrams and product quotients
Week 10	Demaiver's Theorem (Powers and roots)
Week 11	Trigonometric functions (Trigonometric functions, Properties, Rules, Graphing)
Week 12	Inverse trigonometric functions (Applications, Rules, Properties)
Week 13	Logarithmic and exponential functions (Logarithmic and exponential functions, Properties, Rules)
Week 14	Hyperbolic functions (Graphing, Properties, Rules)
Week 15	Inverse hyperbolic functions (Properties, Rules, Graphing)
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thomas, Calculus and Analytic Geometry, Addison-Wesley 1996	Yes
Recommended Texts	Adams, R.A, Calculus, a complete course, Addison-Wesley 2003	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**Democracy and human rights**		**Module Delivery**	
Module Type	**Supportive**		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21026			
ECTS Credits	2			
SWL (hr/sem)	**50**			
Module Level	UG I	**Semester of Delivery**		2
Administering Department	MET	**College**	TCM	
Module Leader	Haider Jawad Kadhim	**e-mail**	haider.kadhim @atu.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor	none	**e-mail**		
Peer Reviewer Name	none	**e-mail**		
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The student gets acquainted with the general concept of democracy and how philosophers defined it according to their vision of it, as well as the advantages of democracy and the mechanism of its application to the life situation, especially in the political and social aspects, then the study of human rights and their relationship to democracy as two syndromes that can be achieved in the methods of life practice
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this course, students will be able to understand and apply the principles of Engineering Mechanics. 1. Students' knowledge of the concept of democracy and its historical roots from the inception of the term in Greece to the present day. 2. Students were introduced to the most important philosophers who had taken the lead in establishing the term through their philosophical views in democracy 3. To familiarize students with the various types of democracy and its advantages in shaping social and political life. 4. Consolidate the principles of democracy that are consistent with the life realities of the human person as the first basis for the individual's freedom. 5. The student learned about Iraq's democratic roots since the establishment of the Iraqi State in 1921 until 2016. (End of ISIS remnants).. 6. Students learned about the importance of the integration of democracy and human rights and their convergence through perspective and application. 7. Developing awareness of ethical principles through a sense of responsibility by applying democratic norms, knowing their foundations and revealing their disadvantages and difficulties. 8. The study of human rights contributes to the development of students' human sense of respect for the different other (pluralism) in all its forms in accordance with human rights standards and laws.Problems solve: Students will be able to calculate the general questions of the force on a plane and carve area. 9. To teach students the principle of the exercise of the inherent right to live at all levels, particularly in politics, and respect for the laws from which that practice emerged Understand the Fluid subjected to acceleration. 10. Consolidate the principles and values guaranteed by universal and Islamic human rights laws.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Part A – Introduction About Freedom and Democracy Introduction to fluid Statics:

- Examination of the concept of democracy and identification of its historical roots
- Philosophers' definition of democracy.
- [4 hrs]

2. Types of democracy:
- Direct democracy has its benefits -- its disadvantages.
- Representative democracy (undermining) and its directions first: near-direct democracy: which relies on a group of citizens as representatives who manage the country's affairs on behalf of the people. That democracy gave the people the right, inter alia, to a popular referendum, a popular objection and a popular proposal..
- Second: representative democracy..
- [6 hrs]

3. The pillars of democracy are represented:
- Freedom
- Human dignity and human rights
- Equality and justice
- Political participation.
- Political pluralism
- Elections..
- [8 hrs]

4. Human rights
- The concept of human rights and their historical evolution.
- Philosophers' definition of human rights
- Human rights features.
- [8 hrs]

5. Its relationship to democracy

Relationship between democracy and human rights
- [8 hrs]

6. Roots of Iraq's Democracy
- The historical roots of democracy in Iraq.
- The civilizational roots of Iraq's democracy included a period of:
- Royal Covenant of 1920-1958 and above.
- First Republican Covenant (1958-2003)
- [8 hrs]

7. Republics:
- Second Republic (1963-1968).
- Third Republic (1968 - 2003).
- [8 hrs]

8. Problems [4 hrs]

Part B – Occupation and Transition: [30 hrs]

Part C – Challenges of Iraq's democratic experience: [15 hrs]

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	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)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2hr	50% (50)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Fluid Covered
Week 1	The concept of democracy, its advantages, and its types
Week 2	Pillars of democracy (freedom, equality, justice, human dignity and human rights, political participation).
Week 3	mechanisms of democracy
Week 4	The concept of human rights
Week 5	human rights attributes
Week 6	human rights attributes.
Week 7	Historical development of human rights
Week 8	human rights rankings
Week 9	The relationship between democracy and human rights
Week 10	The Historical Roots of Democracy in Iraq (1958)
Week 11	Democracy in Iraq from 1958-2003
Week 12	Existing Constitution (2005)
Week 13	Democracy in Iraq from 1958-2003 (the existing constitution).
Week 14	Problems and challenges of democracy in Iraq
Week 15	The contemporary Iraqi experience in democratic transition and the problems it faced.
Week 16	final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Democracy and human rights	Yes
Recommended Texts		No
Websites	Republic of Iraq, Ministry of Human Rights, National Center for Human Rights, Research Department	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Arabic Language		**Module Delivery**	
Module Type	Support		☒ Theory	
Module Code	ATU13		☐ Lecture	
ECTS Credits	2		☐ Lab	
SWL (hr/sem)	50		☐ Tutorial ☐ Practical ☐ Seminar	
Module Level	UGI	**Semester of Delivery**		1
Administering Department	MET	**College**	TCM	
Module Leader	Enas Waleed Jassim	**e-mail**	enas.jassim.tcm@atu.edu.iq	
Module Leader's Acad. Title	Assit. Lecturer	**Module Leader's Qualification**		M.sc
Module Tutor	none	**e-mail**		
Peer Reviewer Name	none	**e-mail**		
Scientific Committee Approval Date	20/01/2024	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. الحفاظ على كتاب الله وسنة نبيه محمد صلى الله عليه واله وسلم و إدراك مبادئ الإسلام وأسس شريعته والاعتزاز بحضارة الأمة الإسلامية . 2. تعويد الطلاب على الاستفادة من المكتبة العربية والرجوع إلى أمهات الكتب . 3. تنمية قدرات الطلاب ومهاراتهم الخطية والإملائية بحيث يستطيعون الكتابة الصحيحة مع ضرورة استعمال علامات الترقيم . 4. تدريب الطلاب على استخدام القواعد النحوية والصرفية أثناء القراءة والكتابة والتعبير. 5. اعانة الطلاب على التعبير الصحيح، وضبط الأساليب وتفهم القرآن الكريم والوقوف على أسراره . 6. تمرين الطلاب على دقة التفكير والبحث العقلي الدقيق . 7. إكساب الطلاب قدرات نحوية تمكنهم من تقويم ألسنتهم عند القراءة . 8. تنمية الثروة اللغوية للطلاب وتزويدهم بكثير من الألفاظ والتراكيب بفضل ما يعرض عليهم من أمثلة. 9. تنمية ملكة الكتابة الصحيحة وفقا للقواعد الإملائية . 10. الربط بين مواد اللغة العربية بجميع فروعها وتطبيق ما تعلموه من مهارات مختلفة . 11. تعويد الطلاب على اليقظة وحسن الإنصات ودقة الاستماع . 12. التعرف على مواطن الضعف عند الطلاب في رسم الكلمات والعمل على علاجها . 13. تعويد الطلاب على قواعد الحديث واحترام الرأي الآخر .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. أن يتعرف الطالب على القواعد النحوية المقررة ويتمكن من استخدامها. 2. أن يتذكر الطالب القواعد النحوية التي سبق دراستها في السنوات السابقة ويربط بينها. 3. أن يستشعر الطالب قيمة دراسة قواعد اللغة العربية في حياته . 4. أن يتدرب الطالب على استخدام قواعد اللغة العربية استخداما صحيحا في القراءة والكتابة. 5. ان يميز الطالب بين الكلمات. 6. ان يعطي الطالب امثلة مختلفة لما تعلمه.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>None</u>

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	ربط وتسهيل اللغة للطالب بواسطة شروحات مبسطة واستشهادات قرآنية وشعرية .

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	31	**Structured SWL (h/w)**	2

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	19	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل		**50**	

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	-	-	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	الاسبوع
	1-2
	3
	4-5
	6
	7
	8
	9
	10

	11
	12-13
	14-15
	16

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts	None	No
Websites	None	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A - Excellent**	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX – Fail**	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**Workshops (II)**		**Module Delivery**	
Module Type	**BASIC**		☐ Theory	
Module Code	ATU21021		☐ Lecture ☐ Lab	
ECTS Credits	4		☐ Tutorial ☒ Practical	
SWL (hr/sem)	**100**		☐ Seminar	
Module Level	UG I	**Semester of Delivery**		2
Administering Department	MET	**College**	TCM	
Module Leader	Salam Obaid Dhahi	**e-mail**	salam.obaid@atu.edu.iq	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**		M.Sc
Module Tutor	Hani Mizhir Majid	**e-mail**	hani.magid@atu.edu.iq	
Peer Reviewer Name	Mohammed A. K	**e-mail**	almuntadher@atu.edu.iq	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals of material science and properties of materials used in engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understanding of casting processes, including sand casting, investment casting, and die casting. 2- Proficiency in mold preparation, molten metal pouring, and post-casting processes. 3- Identification and resolution of common casting defects and adherence to safety guidelines. 4- Knowledge of carpentry tools, materials, and woodworking techniques. 5- Proficiency in measuring, marking, and cutting wood accurately. 6- Skills in wood component assembly, finishing methods, and interpretation of woodworking plans.
Indicative Contents المحتويات الإرشادية	**Casting Workshop:** 1. Gain a comprehensive understanding of casting processes, including sand casting, investment casting, and die casting, and their applications in various industries. 2. Demonstrate proficiency in preparing molds, including mold design, pattern making, and mold assembly, to ensure accurate casting production. 3. Acquire skills in melting and pouring molten metal into molds, controlling casting parameters such as temperature, pouring rate, and solidification time. 4. Understand and implement post-casting processes, including shakeout, cleaning, machining, and finishing, to achieve the desired quality and surface finish of cast components. 5. Identify and troubleshoot common casting defects, such as porosity, shrinkage, and misruns, and apply appropriate corrective measures. 6. Adhere to safety guidelines and practices throughout the casting process, including handling molten metal, using protective equipment, and managing potential hazards. **Carpentry Workshop:** 7. Develop foundational knowledge of carpentry tools, materials, and techniques used in woodworking projects. 8. Demonstrate proficiency in measuring, marking, and cutting wood accurately to specified dimensions. 9. Acquire skills in assembling and joining wood components using various techniques, such as butt joints, mortise and tenon joints, and dovetail joints. 10. Understand and apply different finishing methods, such as sanding, staining, and varnishing, to enhance the appearance and durability of woodwork. 11. Interpret and follow woodworking plans and blueprints to construct furniture, cabinets, or other wooden structures.

	12. Follow safety protocols and practices, including proper handling of tools, usage of protective equipment, and awareness of potential hazards in the carpentry workshop.	

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	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)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	10	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	20% (10)	Continuous	All
	Assignments	4	40% (10)	Continuous	All
	Projects / Lab.	1	20% (10)	Continuous	All
	Report	1	20% (10)	Continuous	All
Summative assessment	Midterm Exam	0			
	Final Exam	0			All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Workshop Syllabus)	
المنهاج الاسبوعي للورش الهندسية	
	Material Covered
Week 1-3	Machining workshop
Week 4-6	Mechanical fitting workshop
Week 7-9	Drilling
Week 10-12	Milling
Week 13-15	CNC

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	الورش الهندسية عملي للمراحل الأولية في كلية الهندسة وكلية العمليات النفطية /قسم هندسة تكرير النفط والغاز تأليف: عبد فارس علي العزاوي	yes
Recommended Texts	Mechanical Workshop Practice: K. C. John	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme				
مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	**Computer Aided Drafting (CAD)**		**Module Delivery**	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21022			
ECTS Credits	3			
SWL (hr/sem)	**75**			
Module Level	UG I	**Semester of Delivery**		2
Administering Department	MET	**College**	TCM	
Module Leader	Shaymaa Abdul Khader Al-Jumaili	**e-mail**	ShaimaaAl-jumaili@atu.edu.iq	
Module Leader's Acad. Title	LECTUER	**Module Leader's Qualification**		M.Sc
Module Tutor	Badr kamoon Dabis	**e-mail**	com.bdr@atu.edu.iq	
Peer Reviewer Name	Mohammed A. K	**e-mail**	almuntadher@atu.edu.iq	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Students will have developed a strong foundation in using AutoCAD for drafting and design purposes. They will be capable of producing high-quality technical drawings, collaborating with others in a CAD environment
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the AutoCAD interface and its key components. 2. Navigate and customize the AutoCAD workspace. 3. Familiarize with essential drawing and editing tools. 4. Set up accurate measurements and coordinate systems. 5. Apply industry-standard drawing settings and preferences. 6. Create basic geometric shapes and manipulate objects. 7. Efficiently select and modify entities using various methods. 8. Utilize grips to control object properties. 9. Organize drawing elements with layers and assign properties. 10. Add accurate dimensions and annotations to drawings. 11. Create reusable blocks and define dynamic attributes. 12. Manage external files and collaborate with xrefs. 13. Utilize advanced editing tools for complex modifications. 14. Create 2D isometric views and understand conventions. 15. Generate realistic renderings and set up plotting and printing.
Indicative Contents المحتويات الإرشادية	Indicative Contents and Duration of the Computer-Aided Drafting (AutoCAD) Course: **Module 1**: Introduction to AutoCAD (3 hours) AutoCAD interface and components Navigation tools and customization options **Module 2**: Drawing Setup (2 hours) Drawing units, scales, and coordinate systems Drawing settings and preferences **Module 3**: Basic Drawing and Editing (5 hours) Creating lines, circles, arcs, and polygons Modifying objects using editing commands **Module 4**: Object Selection and Manipulation (3 hours) Object selection methods Manipulating objects using grips

Module 5: Layers and Properties (3 hours)

Creating and managing layers

Assigning properties to objects

Module 6: Dimensioning and Annotation (4 hours)

Adding dimensions, text, and annotations

Applying text styles, leader lines, and symbols

Module 7: Blocks and Attributes (3 hours)

Creating and inserting blocks

Defining attributes within blocks

Module 8: External References (2 hours)

Linking and managing external files

Working with xrefs

Module 9: Advanced Editing Tools (4 hours)

Trim, extend, fillet, chamfer, and offset commands

Advanced editing techniques

Module 10: Isometric Drawing (3 hours)

Creating 2D isometric views

Isometric drawing conventions

Module 11: Introduction to 3D Modeling (4 hours)

Creating basic 3D objects

Navigating in 3D space

Module 12: Rendering and Visualization (3 hours)

Applying materials, textures, and lighting effects

Generating renderings

Module 13: Plotting and Printing (3 hours)

Setting up layouts

Configuring plot styles and page setups

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The Computer-Aided Drafting (AutoCAD) course employs a variety of learning and teaching strategies, including a combination of lectures, hands-on exercises, and practical design projects. Students engage in active learning by actively using AutoCAD software to apply the concepts taught. The course emphasizes a student-centered approach, fostering critical thinking and problem-solving skills. Regular feedback and assessments are provided to gauge progress and address any challenges. Collaboration and discussion are encouraged to enhance knowledge sharing and promote a deeper understanding of the subject matter

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation				
تقييم المادة الدراسية				
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
:--	:--	:--	:--	:--	:--
Formative assessment	Quizzes	4	10% (10)	4, 7, 12 and 14	LO #2, #4 and #10, #15
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment		100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Module 1: Introduction to AutoCAD
Week 2	Module 2: Drawing Setup
Week 3	Module 3: Basic Drawing and Editing
Week 4	Module 4: Object Selection and Manipulation
Week 5	Module 5: Layers and Properties
Week 6	Module 6: Dimensioning and Annotation
Week 7	Module 7: Blocks and Attributes
Week 8	Module 8: External References
Week 9	Module 9: Advanced Editing Tools
Week 10	Module 10: Isometric Drawing
Week 11	Module 11: Introduction to 3D Modeling
Week 12	Module 12: Rendering and Visualization
Week 13	Module 13: Plotting and Printing
Week 14	Review and Practice
Week 15	Final Project and Assessment
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to AutoCAD Interface and Navigation Lab 2: Basic Drawing Commands and Editing Tools
Week 2	Lab 3: Drawing Setup and Units Lab 4: Object Selection and Manipulation Techniques
Week 3	Lab 5: Layer Management and Object Properties Lab 6: Dimensioning and Annotation Tools
Week 4	Lab 7: Creating and Inserting Blocks Lab 8: Working with Attributes
Week 5	Lab 9: Managing External References (Xrefs) Lab 10: Advanced Editing Tools and Techniques
Week 6	Lab 11: Isometric Drawing Techniques Lab 12: Creating 3D Objects in AutoCAD
Week 7	Lab 13: Applying Materials and Textures for Rendering Lab 14: Lighting and Rendering Techniques

Week 8	Lab 15: Layout Setup and Plotting Configuration Lab 16: Printing and Publishing Drawings
Week 9	Lab 17: Review and Practice Session
Week 10	Lab 18: Mid-term Project and Assessment
Week 11	Lab 19: Advanced Topics and Techniques
Week 12	Lab 20: Final Project Work and Consultation
Week 13	Lab 21: Final Project Work and Consultation
Week 14	Lab 22: Final Project Work and Consultation
Week 15	Lab 23: Final Project Presentation and Assessment

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Shumaker, T.M., Madsen, D.A. and Madsen, D.P., 2014. AutoCAD and Its Applications Basics 2015.	NO
Recommended Texts	- Omura, G. and Benton, B.C., 2013. Mastering AutoCAD 2014 and AutoCAD LT 2014: Autodesk Official Press. John Wiley & Sons. - Hamad, M., 2018. AutoCAD 2019 Beginning and Intermediate. Mercury Learning and Information. - Hamad, M., 2019. AutoCAD 2020 3D Modeling. In AutoCAD 2020 3D Modeling. Mercury Learning and Information.	No
Websites	- https://www.autodesk.com/education/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Mathematics (II)**	**Module Delivery**	
Module Type	**Basic**	☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21023		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		
Module Level	UG I	**Semester of Delivery**	2
Administering Department	MET	**College**	TCM
Module Leader	Hanen Hamid Oda	**e-mail**	E-mail
Module Leader's Acad. Title	Asist. Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Mohammed A. K	**e-mail**	almuntadher@atu.edu.iq
Peer Reviewer Name	Hani Mizhir Majid	**e-mail**	hani.magid@atu.edu.iq
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU21013	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The aim of this course is to give an introductory course on basics of analysis, to teach general concepts such as Functions Limit and continuity Derivatives and its applications, Curve sketching Maximum and minimum problems Integral and area calculations Definite and indefinite integrals Techniques of integration Improper İntegrals Applications of integration-volume, area of surfaces, arc length of curves
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Apply derivative rules to find derivatives of functions, including composite and implicitly defined functions. 2. Logarithmic and Exponential Functions: 3. Apply derivative rules to find derivatives of logarithmic and exponential functions. 4. Compute derivatives of trigonometric functions and differentiate inverse trigonometric functions. 5. Compute derivatives of hyperbolic functions and differentiate inverse hyperbolic functions. 6. Use derivatives to analyze velocity, acceleration, and find maximum and minimum values of functions. 7. Apply L'Hôpital's rule to find limits involving indeterminate forms. 8. Identify points of inflection. 9. Apply integration formulas to find indefinite integrals. 10. Integrate logarithmic, exponential, trigonometric, and inverse trigonometric functions. 11. Use integration techniques for integrals involving hyperbolic functions, inverse hyperbolic functions, trigonometric substitutions, and partial fractions. 12. Use definite integrals to calculate areas under curves and find the area between two curves. 13. Evaluate triple integrals to calculate volumes.
Indicative Contents المحتويات الإرشادية	1. Derivatives of Functions: • Apply the rules of derivatives to find the derivatives of various functions. • Use the chain rule to differentiate composite functions. • Differentiate implicitly defined functions. 2. Derivatives of Logarithmic and Exponential Functions: • Apply the rules of derivatives to logarithmic and exponential functions. • Find the derivatives of functions involving logarithmic and exponential functions. 3. Derivatives of Trigonometric Functions: • Compute the derivatives of trigonometric functions. • Differentiate inverse trigonometric functions. 4. Derivatives of Hyperbolic Functions: • Compute the derivatives of hyperbolic functions. • Differentiate inverse hyperbolic functions.

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5. Application of Derivatives:
- Apply L'Hôpital's rule to find limits involving indeterminate forms.
- Use derivatives to analyze velocity and acceleration, and find maximum and minimum values of functions.
- Identify points of inflection.

6. Indefinite Integrals and Integration Formulas:
- Apply integration formulas to find indefinite integrals.
- Integrate logarithmic and exponential functions.

7. Integrals of Trigonometric and Inverse Trigonometric Functions:
- Integrate trigonometric functions using appropriate techniques.
- Evaluate integrals involving inverse trigonometric functions.

8. Integrals of Hyperbolic and Inverse Hyperbolic Functions:
- Integrate hyperbolic functions and inverse hyperbolic functions.

9. Methods of Integration:
- Use integration by parts to evaluate integrals.
- Apply integration techniques for integrals involving odd and even powers of sine and cosine.

10. Integration of Trigonometric Substitutions and Partial Fractions:
- Apply trigonometric substitutions to evaluate integrals.
- Use partial fractions to integrate rational functions, including those involving trigonometric functions.

11. Applications of Integration:
- Use definite integrals to calculate areas under curves and compute the area between two curves.

12. Triple Integrals and Double Integrals:
- Evaluate triple integrals to calculate volumes.
- Use double integrals to find the area between two curves.

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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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<tr>
<td>**Strategies**</td>
<td>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.</td>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #2 and #6
	Assignments	0	0% (10)		
	Projects / Lab.	0	0% (10)		
	Report	0	0% (10)		
Summative assessment	Midterm Exam	2hr	40% (40)	6	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Derivatives of functions (Rules of derivatives, Chain rule, Implicit derivatives)
Week 2	Derivatives of logarithmic and exponential functions (Rules of derivatives of logarithmic and exponential functions)
Week 3	Derivatives of trigonometric functions (Derivatives of trigonometric and inverse trigonometric functions)
Week 4	Derivatives of hyperbolic functions (Derivatives of hyperbolic and Inverse hyperbolic functions)
Week 5	Application of Derivatives (L'Hapital rule, Velocity and acceleration - Max. and Min. ,Point of inflection)
Week 6	Mid-term Exam

Week 7	Indefinite IntegralsI (ntegration formulas , Integration of logarithmic and exponential functions)
Week 8	Integrals of functions (Trigonometric and inverse trigonometric functions)
Week 9	Integrals of other functions (Hyperbolic and Inverse hyperbolic functions)
Week 10	Methods of Integration (Integration by parts ,Integration for odd and even powers of sine and cosine)
Week 11	Integration of Trigonometric Substitutions (Trigonometric Substitutions, Integral involving a x2 + b x + c)
Week 12	Integration of Partial fractions and Rational functions (Partial fractions, Rational functions of sinx and cosx and other trigonometric functions)
Week 13	Applications of Integration (Definite integral and area)
Week 14	Triple Integrals (volume)
Week 15	Double Integrals Area between two curves
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas, Calculus and Analytic Geometry, Addison-Wesley 1996	Yes
Recommended Texts	Adams, R.A, Calculus, a complete course, Addison-Wesley 2003	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Engineering Mechanics (II)**	**Module Delivery**	
Module Type	Core	⊠ Theory ⊠ Lecture ⊠ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21024		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	UG I	**Semester of Delivery**	2
Administering Department	MET	**College**	TCM
Module Leader	Kussay Ahmed Subhi	**e-mail**	kussaysubhi@atu.edu.iq
Module Leader's Acad. Title	LECTUER	**Module Leader's Qualification**	Ph.D.
Module Tutor	Badr Kamoon Dabis	**e-mail**	com.bdr@atu.edu.iq
Peer Reviewer Name	Hani Mizhir Majid	**e-mail**	hani.magid@atu.edu.iq
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU21014	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals of the Deals with the forces and their effects while acting upon the bodies in motion.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this course, students will be able to understand and apply the principles of Engineering Mechanics. 1. Apply Newton's laws of motion: Students will gain proficiency in applying Newton's laws to solve problems involving the motion of objects, including linear and angular motion. 2. Understand kinematics and kinetics: Students will comprehend the concepts of kinematics (study of motion without considering forces) and kinetics (study of motion with the influence of forces) and be able to solve related problems. 3. Analyze particle and rigid body dynamics: Students will gain the ability to analyze the motion of particles and rigid bodies, considering factors like velocity, acceleration, and forces acting on them. 4. Vibrations: Introduction to vibrations and oscillations, Free and forced vibrations, Single-degree-of-freedom systems, and Damping, resonance, and vibration control.

Indicative Contents
 	
المحتويات الإرشادية
	Indicative content includes the following.
	
	Part A – Introduction to Analyze Mechanical Systems (Dynamic): [60 hrs]
	
	1. Introduction to Dynamics:
	   • Definition and importance of dynamics in engineering
	   • Difference between statics and dynamics
	   • Types of motion (linear, angular, translational, rotational)
	2. Kinematics of Particles:
	   • Displacement, velocity, and acceleration of particles
	   • Rectilinear and curvilinear motion
	   • Tangential and normal components of acceleration
	   • Motion in a plane
	3. Kinetics of Particles:
	   • Newton's laws of motion
	   • Linear momentum and its conservation
	   • Impulse and momentum
	   • Application of Newton's second law to particle motion
	4. Work and Energy:
	   • Work done by a force
	   • Kinetic energy and potential energy
	   • Principle of work and energy
	   • Conservation of mechanical energy
	5. Power and Efficiency:
	   • Definition of power
	   • Power and work rate
	   • Efficiency of mechanical systems

- Power transmission and conversion

6. Kinematics and Kinetics of Rigid Bodies:
   - Translation, rotation, and general plane motion of rigid bodies
   - Displacement, velocity, and acceleration of rigid bodies
   - Moment of inertia and mass moment of inertia
   - Angular momentum and its conservation

7. Vibrations:
   - Introduction to vibrations and oscillations
   - Free and forced vibrations
   - Single-degree-of-freedom systems
   - Damping, resonance, and vibration control

Part B – Engineering Mechanic Lab: [30 hrs]

Part C – Engineering Mechanic Tutorial: [15 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	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)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	4, 7, 12 and 14	All
	Assignments	2	10% (10)	2 and 12	All

	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	DYNAMIC OF PARTICLES.
Week 2	DYNAMIC OF PARTICLES.
Week 3	ABSOLUTE MOTION. LINEAR
Week 4	ABSOLUTE MOTION. CIRCULAR
Week 5	ABSOLUTE MOTION. CURVILINEAR
Week 6	FORCE, MASS AND ACCELERATION.
Week 7	FORCE, MASS AND ACCELERATION.
Week 8	RELATIVE CERCLE MOTION.
Week 9	RELATIVE CERCLE MOTION.
Week 10	KINEMATICS OF ARIGID BODY.
Week 11	KINEMATICS OF ARIGID BODY.
Week 12	WORK AND ENERGY.
Week 13	WORK AND ENERGY.
Week 14	IMPULES AND MOMENTUM.
Week 15	PRINCIPLES OF VIBRATIONS.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Lab 1: Kinematics of Particle Motion: • Measurement of displacement, velocity, and acceleration of a projectile • Verification of equations of motion for linear and projectile motion
Week 3-4	Force and Acceleration: • Measurement of forces using force transducers or load cells • Investigation of the relationship between force, mass, and acceleration
Week 5-6	Conservation of Linear Momentum:

Week		
	• Collision experiments using air track or dynamics carts • Measurement of velocities before and after collisions	
Week 7-8	**Work and Energy:** • Measurement of work done by a force using force and displacement sensors • Verification of the work-energy principle through various experiments	
Week 9-10	**Rotational Motion:** • Measurement of rotational motion parameters (angular displacement, velocity, and acceleration) • Verification of rotational dynamics principles using rotational apparatus	
Week 11-12	**Vibration Analysis:** • Analysis of free vibrations of a simple pendulum or mass-spring system • Measurement of natural frequencies and damping ratios of vibrating systems	
Week 13-15	**Computer Simulations:** • Utilization of simulation software to model and analyze dynamic systems • Virtual experiments to understand the behavior of particles and rigid bodies under various conditions	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	[R.C._Hibbeler]_Engineering_Mechanic_Dynamic__(Sol(b-ok.org) 2017	Yes
Recommended Texts		No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Computer Programming	**Module Delivery**
Module Type	**Basic**	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	**ATU21025**	
ECTS Credits	**3**	
SWL (hr/sem)	**100**	

Module Level	UG I	**Semester of Delivery**	2
Administering Department	MET	**College**	TCM
Module Leader	Shaymaa AbdulKhader Hamzah	**e-mail**	shaimaaal-jumaili@atu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.sc
Module Tutor	none	**e-mail**	
Peer Reviewer Name	none	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules		
العلاقة مع المواد الدراسية الأخرى		
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of computer programs. 2. To understand functions of engineering programs. 3. This course deals with the basic concept of derivation of functions programs. 4. This is the basic subject for all method of integration methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize different types of functions and their behavior in science topics. 2. List the various lows associated with limits of computer. 3. Summarize what is meant by a basic computer. 4. Discuss the domain and range of many types of functions. 5. Describe computer components.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>None</u>

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (10)	3,5,10 and 12	LO #1, #2 and #10, #11
	Assignments	4	20% (10)	5,7, 9and 13	LO #3, #4 and #6, #7
	Projects / Lab.	0	10% (10)	-----	----
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
Week	Material Covered
1+2	Definition of computers components and generations
3	MS-Doc Operating System
4+5	internal operating system commands
6	External operating system commands
7	The concept of Windows and its advantages
8	Take advantage of some keys to enter and close programs
9	Learn about desktop components
10	Take advantage of the control panel
11	Take advantage of additional programs
12+13	Note pad , WordPad handling
14+15	The concept of computer viruses
16	Preparatory week before the final Exam

<table>
<tr><td colspan="3">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td>Text</td><td>Available in the Library?</td></tr>
<tr><td>Required Texts</td><td>اساسيات الحاسوب وتطبيقاتها
تاليف
أ.م.د. زياد محمد عبود   أ.د.غسان حميد عبد المجيد</td><td>Yes</td></tr>
<tr><td>Recommended Texts</td><td>None</td><td>No</td></tr>
<tr><td>Websites</td><td colspan="2">None</td></tr>
</table>

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Grading Scheme
مخطط الدرجات

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Strength of materials - Fundamentals	**Module Delivery**
Module Type	Core	☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐**Practical** ☐ **Seminar**
Module Code	ATU21031	
ECTS Credits	5	
SWL (hr/sem)	125	

Module Level	UG II	**Semester of Delivery**	3
Administering Department	MET	**College**	TCM
Module Leader	Kussay Ahmed Subhi	**e-mail**	kussaysubhi@atu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D
Module Tutor	Badr Kamoon Dabis	**e-mail**	com.bdr@atu.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	12/06/2023	**Version Number**	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To understand the basic theories of the Strength of Materials theories and develop a method in problem-solving skills through some application of techniques. 2. To understand the important material properties and their effects on material strength. 3. To lay out a procedure that enables students to calculate and solve the exercises in this course.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Describe the criteria used in specifying the material's strength. 2. Explain the importance of calculating stress-strain effects on material failure. 3. Identify the effect of the stress concentration and its effects on the material's strength. 4. Discuss the principle of failure mode due to the effects of thermal stresses. 5. Explain the effects of stiffness, hooks law, strain, and strain ratio on the material behavior. 6. Identify the principle of the poison ratio.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A – Principals in the strength of material's [60 hrs]** Introduction to Analysis of internal forces, Simple stress, Shearing, Bearing, Tearing stresses, Simple strain, Stress-strain diagram, Hook's law, axial deformation, Shearing force & bending moment, S.F. & B.M. diagrams, Mohr's circle, and Application of Mohr's circle. **Part B – Experimental Test [30 hrs]** Tensile Test, Torsion test, Bending test, Thick Cylinder Test, Hardness test.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	The adopted strategy for this module is to enhance the student's ability and increase their understanding of calculations skills and expand their critical thinking skills. Students will participate in the exercises, while at the same time will be able to achieve interactive tutorials by considering types of simple experiments involving some sampling activities that are interesting to the students. Also, Students will join the lab to do some experiments and tests.

Student Workload (SWL)

<div dir="rtl">الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا</div>

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

<div dir="rtl">تقييم المادة الدراسية</div>

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	Continuous	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

<div dir="rtl">المنهاج الاسبوعي النظري</div>

	Material Covered
Week 1	Introduction to the Strength of Materials. Analysis of internal forces.
Week 2	Simple stress, Shearing, bending, Bearing stresses.
Week 3	Stress and types application
Week 4	Thermal stresses
Week 5	Simple strain, Stress-strain diagram, Hook's law, axial deformation.
Week 6	Strain and types
Week 7	Poisons ratio
Week 8	Stress concentration
Week 9	Rivets

Week 10	Welds
Week 11	Pressure vessel
Week 12	Torsion
Week 13	Shearing force & bending moment
Week 14	Mohr's circle, Application of Mohr's circle
Week 15	Mohr's circle, Application of Mohr's circle

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Mechanics of Materials. Eighth Edition** **By: R.C. HIBBELER**	No
Recommended Texts	**STRENGTH OF MATERIALS** **By: F.L.Singer , and A.Pytel**	No
Websites	https://www.academia.edu/9407986/_Strength_of_Materials_4th_Edition_by_Ferdinand_L_Singer_and_Andrew_Pytel_	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A - Excellent**	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX – Fail**	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><td colspan="5">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td colspan="2">Thermodynamics - Fundamentals</td><td colspan="2">Module Delivery</td></tr>
<tr><td>Module Type</td><td colspan="2">Core</td><td colspan="2" rowspan="4">☒ Theory
☐ Lecture
☒ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td colspan="2">ATU21032</td></tr>
<tr><td>ECTS Credits</td><td colspan="2">5</td></tr>
<tr><td>SWL (hr/sem)</td><td colspan="2">125</td></tr>
<tr><td>Module Level</td><td>UG II</td><td>Semester of Delivery</td><td colspan="2">3</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td colspan="2">TCM</td></tr>
<tr><td>Module Leader</td><td>Kadhim Fadhil Nasir</td><td>e-mail</td><td colspan="2">kad2020@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td>Assistant Professor</td><td>Module Leader's Qualification</td><td colspan="2">Ph.D.</td></tr>
<tr><td>Module Tutor</td><td></td><td>e-mail</td><td colspan="2"></td></tr>
<tr><td>Peer Reviewer Name</td><td></td><td>e-mail</td><td colspan="2"></td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2023</td><td>Version Number</td><td colspan="2">1.0</td></tr>
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<table>
<tr><td colspan="4">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
</table>

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To understanding the basic principles and concept of thermodynamics. 2. To understand the kinds of energy, process , system, cycles, power, pure substance , ideal gas . 3. To teach the student how to use the steam table . 4. This course deals with the basic concept of heat and work. 5. To present a wealth of real-world engineering examples to give students a feel for how thermodynamics is applied in engineering practice 6. To develop an intuitive understanding of thermodynamics by emphasizing the physics and physical arguments. 7. This is the basic subject for gas and vapor power cycles.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. List the various terms in the thermodynamic science . 2. Summarize what is meant by a basic concept of thermodynamics 3. Summarize the first law of thermodynamics. 4. Draw the p-v diagram of constant pressure (phase change process of a pure substance at various pressure) 5. Explain the phase change process of pure substance. 6. List the kinds of work.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Basic concept for thermodynamics Introduction , unites, temperature, pressure, thermodynamics system, type so system, state , process, phase, forms of energy. Properties of pure substance , phase-change process for pure substance, using steam table, compressed liquid. Saturated liquid , mixture, saturate d vapor, superheated and ideal gas and solve problems. First law of thermodynamics (closed system), heat transfer , work, kind of work, processes , specific heat and solve problems. First law of thermodynamics (control volume), conservation of mass principle , conservation of energy principle, open system, steady state ,

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم
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)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #3 and #6, #9
	Assignments	2	10% (10)	4 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introductions, references, units
Week 2	The basic concept of thermodynamics

Week 3	Properties of Pure Substances
Week 4	Properties of Pure Substances
Week 5	Use of steam table
Week 6	Examples on steam tables
Week 7	The ideal gas equation of state
Week 8	Forms of Energy
Week 9	The first law of thermodynamics in closed system
Week 10	Mechanical forms of work
Week 11	Energy analysis for closed system (Processes)
Week 12	First law of thermodynamics in closed system
Week 13	Specific heat (internal energy, enthalpy and specific hat of ideal gases)
Week 14	Mass and Energy Analysis of Control Volumes
Week 15	Some Steady-Flow Engineering Devices
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1+2	Types of temperature measurements
Week 3+4	Boyles Law
Week 5+6	Jarales's law
Week 7	The ratio between the two specific heats of a gas γ

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thermodynamic an engineering approach , eight edition , Yunus A. Cengel and Michael A. Boles	No
Recommended Texts	Applied thermodynamics for engineering technologists, A. Mc Conky and T.D. Eastop	No

Websites	https://www.amazon.com/Thermodynamics-Engineering-Approach-Textbook-Hardcover/dp/B0722G5SQC

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	**Fluid Mechanics - Static**	**Module Delivery**
Module Type	Core	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ATU21033	
ECTS Credits	5	
SWL (hr/sem)	**125**	

Module Level	UG II	**Semester of Delivery**	3
Administering Department	MET	**College**	TCM
Module Leader	Hasan Ali Jurmut	**e-mail**	hasan.jurmut@atu.edu.iq
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor	none	**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

	Module Aims, Learning Outcomes and Indicative Contents
	أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية
Module Objectives أهداف المادة الدراسية	To teach the fundamentals of the study properties of fluid at static , pressure distribution, and Hydrostatic force on surface.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this course, students will be able to understand and apply the principles of Engineering Mechanics. 1. Understand the fundamental of fluid: Students will grasp the basic principles of fluid mechanics, including such as density, specific weight, viscosity, Specific gravity ,and Specific volume. 2. Equation of state: Students will be able to analyze and solve problems related to Equation of state, including the calculation of the equation of Compression of gases 3. Calculate the Kinematics Viscosity: Students will be able to determine such as a Kinematics Viscosity and solve the Exercise. 4. Surface tension and Capillarity problems: Students will develop the skills to apply the principles of fluid Mechanics to solve real-world engineering problems, such as Surface tension and Capillarity problem's. 5. Fluid Statics: Students will be able to determine the pressure distribution, Pressure Measurement and calculation the problems of Pressure Variation in a Static Fluid. 6. Problems solve: Students will be able to calculate the general questions. 7. Hydrostatic force on surface , Students will be able to calculate the forces on plane. 8. Hydrostatic force on surface , Students will be able to calculate the forces on carves. 9. Centroidal moments of inertia for various cross section: (a) rectangle (b) circle (c) triangle (d) semicircle : Students will be able to solve various elementary areas can be found as a resultant of the horizontal and vertical force on a plane and carve area. 10. Problems solve: Students will be able to calculate the general questions of the force on a plane and carve area. 11. Buoyancy and flotation : Students will be able to calculate The buoyant force on anybody is equal to the weight of the fluid displaced. 12. Understand the Fluid subjected to acceleration. 13. Understand the Kinematics of Fluid flow
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Introduction to Analyze fluid mechanics (Static): 1. Introduction to fluid Statics: • Definition and properties of static fluid in engineering

- Branches of fluid mechanics.
- Approaches of fluid mechanics.
- [4 hrs]

2. Fluid statics:
- Unit of dimensions in Fluid Mechanics(SI,BG) .
- Conversion of units from English units to SI units .
- Properties of fluid Mechanics.
- Definition of coefficient of viscosity
- Surface tension.
- [6 hrs]

3. Pressure:
- pressure distribution.
- Pressure Measurement
- Pressure Variation in a Static Fluid
- Capillarity rise.
- [8 hrs]

4. Hydrostatic force on surface:
- Classification the forces.
- Force on plane.
- Force on carve.
- Calculation of the forces on plane and carve.
- [6 hrs]

5. Buoyancy and flotation:
- Introduction to Buoyancy and flotation
- Laws of Buoyancy and flotation
- Floating bodies.
- Calculation the problemes.
- [8 hrs]

6. Fluid subjected to acceleration:
- fluid mass subjected to acceleration in both direction (X) ax and (Z) az .
- Centripetal Acceleration with constant Angular velocity about vertical axis.
- Drive the equations.
- Calculate the problems.
- [8 hrs]

7. Kinematics of Fluid flow:
- Introduction in fluid flow.
- Steady and unsteady flow.
- Laminar and turbulent flow .
- One dimension flow .
- [8 hrs]

8. Equation of continuity :
- Introduction and analysis.
- Equation of continuity in one dimension
- Drive the equation of continuity
- Calculation the equation of continuity
- [8 hrs]

	9. Problems [4 hrs]
	Part B – Fluid Mechanic Lab: [30 hrs]
	Part C – Fluid Mechanic Tutorial: [15 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	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)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	4, 7, 12 and 14	LO #2, #4 and #10, #15
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	13	LO #5, #8 and #10
	Report	-	-		
	Midterm Exam	2hr	10% (10)	7	LO #1 - #7

Summative assessment	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Fluid Covered
Week 1	General Principles of Fluid Static.
Week 2	Properties of fluid mechanics.
Week 3	Compressibility of a liquids.
Week 4	Type of Viscosity
Week 5	Surface tension and Capillarity rise.
Week 6	Fluid statics.
Week 7	Pressure Variation in a Static Fluid.
Week 8	Hydrostatic force on surface
Week 9	Hydrostatic force on surface plan.
Week 10	Hydrostatic force on curved surface.
Week 11	Buoyancy and flotation.
Week 12	Fluid subjected to acceleration.
Week 13	Kinematics of Fluid flow.
Week 14	Equation of continuity (one – dimensional flow).
Week 15	One - two, and three – dimensional flow.
Week 16	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered

Week 1-3	Lab 1: Introduction to fluid statics .
Week 4-5	Lab 2: viscosity
Week 6-7	Lab 3: pressure
Week 8-9	Lab 4: center of pressure
Week 10-11	Lab 5: pressure distribution on plane
Week 12-13	Lab 6: pressure measurement
Week 14-15	Lab 7: Partial immersion and total immersion

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Franzini Fluid mechanics 10 edition	Yes
Recommended Texts		No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><td colspan="4" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td align="center">Mathematics -Third Level</td><td colspan="2">Module Delivery</td></tr>
<tr><td>Module Type</td><td align="center">Basic</td><td colspan="2" rowspan="4">☒ Theory
☐ Lecture
☐ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td align="center">ATU21034</td></tr>
<tr><td>ECTS Credits</td><td align="center">4</td></tr>
<tr><td>SWL (hr/sem)</td><td align="center">100</td></tr>
<tr><td>Module Level</td><td>UG II</td><td>Semester of Delivery</td><td>3</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td>TCM</td></tr>
<tr><td>Module Leader</td><td>Hanen Hamid Oda</td><td>e-mail</td><td>haneen.aoda@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td>Asist. Lecturer</td><td>Module Leader's Qualification</td><td>M.Sc.</td></tr>
<tr><td>Module Tutor</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Peer Reviewer Name</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2023</td><td>Version Number</td><td>1.0</td></tr>
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<table>
<tr><td colspan="4" align="center">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>Mathematics (II)</td><td>Semester</td><td>2</td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
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Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The aim of this course is to give an introductory course on basics of analysis, to teach general concepts such as Functions Limit and continuity Derivatives and its applications, Curve sketching Maximum and minimum problems Integral and area calculations Definite and indefinite integrals Techniques of integration Improper İntegrals Applications of integration-volume, area of surfaces, arc length of curves
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Solving Ordinary Linear Differential Equations (1st order differential equations, Separable, Homogeneous, Exact Linear, Bernoulli) 2. sketch and interpret the graph of functions. 3. Define Vector in Space, Parallel Vectors and Triple Product. 4. Solving Equations of Line in Space 5. Taking Applications of Double and Triple. 6. Define Special Functions Gama Function, Beta Function 7. Define the Polar Coordinates and its applications. 8. Find Rotation of axis, The Arc of polar curve and slope of tangent
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Work to solving 2nd Order Differential Equations, Reducible to order, Homogeneous, Higher Order Differential, Equations, Homogeneous, Applications, Sequences and Series, Sequence, The Integral Test, Alternating Series, Interval of Convergence Alternating Series, Interval of Convergence, Fourier Series Partial Differentiation (Definition, Mechanism of Differentiation, Functions of Two Variables Functions of Higher Variables) Directional Derivative, Maxima. Minima and Saddle Points, Lagrange Theorem Vector (Vector in Space, Parallel Vectors, Triple Product) Volume of Box, Projection of Two Vectors. Part B – Equation of Line in Space, Equation of Plane in space, Applications, Applications of Double and Triple, Sketching of Geometric Shapes, Double Integrals, Triple Integrals Jacobian Transformation, Area in Polar Curve Surface Area, Special Functions Gama Function, Beta Function, Polar Coordinates, Polar Curve Representation, sketching of Polar Curve, Rotation of axis, The Arc of polar curve, slope of tangent, Plane Area.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	

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)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	41	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #2 and #6
	Assignments	1	10% (10)	2	1-3
	Projects / Lab.	1	10% (10)	8	all
	Report	0	0% (10)		
Summative assessment	Midterm Exam	2hr	10% (10)	6	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment		100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Ordinary Linear Differential Equations (1st order differential equations, Separable, Homogeneous, Exact Linear, Bernoulli)

Week 2	2nd Order Differential Equations, Reducible to order, Homogeneous, Higher Order Differential Equations, Homogeneous, Applications
Week 3	Sequences and Series, Sequence, The Integral Test, Alternating Series, Interval of Convergence
Week 4	Alternating Series, Interval of Convergence, Fourier Series
Week 5	Partial Differentiation (Definition, Mechanism of Differentiation, Functions of Two Variables Functions of Higher Variables)
Week 6	Mid-term Exam
Week 7	Directional Derivative, Maxima. Minima and Saddle Points, Lagrange Theorem
Week 8	Vector (Vector in Space, Parallel Vectors, Triple Product)
Week 9	Volume of Box, Projection of Two Vectors
Week 10	Equation of Line in Space, Equation of Plane in space, Applications
Week 11	Applications of Double and Triple, Sketching of Geometric Shapes, Double Integrals, Triple Integrals
Week 12	Jacobian Transformation, Area in Polar Curve Surface Area
Week 13	Special Functions Gama Function, Beta Function
Week 14	Polar Coordinates, Polar Curve Representation, sketching of Polar Curve
Week 15	Rotation of axis, The Arc of polar curve, slope of tangent, Plane Area
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas, Calculus and Analytic Geometry, Addison-Wesley 1996	Yes
Recommended Texts	Adams, R.A, Calculus, a complete course, Addison-Wesley 2003	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	**FX – Fail**	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><td colspan="4" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td align="center">Manufacturing Processes</td><td colspan="2">Module Delivery</td></tr>
<tr><td>Module Type</td><td align="center">Basic</td><td colspan="2" rowspan="4">☒ Theory
☐ Lecture
☒ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td align="center">ATU21034</td></tr>
<tr><td>ECTS Credits</td><td align="center">3</td></tr>
<tr><td>SWL (hr/sem)</td><td align="center">75</td></tr>
<tr><td>Module Level</td><td>UG II</td><td>Semester of Delivery</td><td>4</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td>TCM</td></tr>
<tr><td>Module Leader</td><td>Salam Obaid Dhahi</td><td>e-mail</td><td>Salam.obaid@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td>Lecturer</td><td>Module Leader's Qualification</td><td>M.Sc.</td></tr>
<tr><td>Module Tutor</td><td>Badr Kamoon Dabis</td><td>e-mail</td><td>com.bdr@atu.edu.iq</td></tr>
<tr><td>Peer Reviewer Name</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2023</td><td>Version Number</td><td>1.0</td></tr>
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<table>
<tr><td colspan="4" align="center">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
</table>

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of manufacturing processes techniques. 2. To understand how to classify the most familiar manufacturing processes. 3. This course deals with the main principal factor that are affecting manufacturing processes. 4. This is the basic subject for connecting elements for optimum products manufacturing. 5. To understand how to reduce the financial cost for production steps. 6. To perform both theoretical and practical steps and comparing results.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how machining process has been controlled. 2. List the various terms associated with manufacturing processes. 3. Summarize what is meant by all of manufacturing terms. 4. Discuss the side effect of direct manufacturing process including temperature rising and its effect on mechanical properties of metals. 5. Describe the proposed technological path for the whole processes. 6. Define the required boundary condition for smooth manufacturing process.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Basics of Manufacturing Process: Manufacturing Process elements, Tool Classifications, Engineering Materials Types, Mechanical Properties, Physical Properties, and Financial Cost. [15 hrs] Welding Process, Drilling Process, Turning Process, and Milling Process. [15 hrs] Establishing the expected technological path, Gantt chart, Time duration, and Tools lifetime. [10 hrs] Heat Generated, Path length calculation, milling depth, cutting speed, and feed speed. [15 hrs] Revision problem classes [6 hrs] Part B – Main Requirements Principals manufacturing processes, affecting elements, preparing samples, and total financial cost estimation. [15 hrs] Manufacturing process simulation, computer aided design, computer numerical control, heat dissipation process, and assistive tools. [7 hrs] Lubrication process, wear resistance, friction calculations, displacement sensing systems, and measurement tools. [15 hrs]

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
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)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation				
تقييم المادة الدراسية				
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
---	---	---	---	---	---
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #8, #9
	Assignments	-	-		
	Projects / Lab.	1	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – Manufacturing Processes
Week 2	Extrusion : ,Extrusion Methods- Equipment -Extrusion of Nonmetals.
Week 3	Rolling Process
Week 4	FUNDAMENTALS OF METAL FORMING
Week 5	Forging Process
Week 6	Drawing Process
Week 7	**Mid-term Exam**
Week 8	Turning Process
Week 9	Milling Process
Week 10	Drilling Process
Week 11	ELECTRIC DISCHARGE MACHINING .
Week 12	*Wire EDM* ,
Week 13	Electron beam machining , EBM
Week 14	Welding process as a manufacturing process
Week 15	Grinding Process
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Drilling Process
Week 2	Lab 2: Turning Process
Week 3	Lab 3: Rolling Process
Week 4	Lab 4: Welding process as a manufacturing process
Week 5	Lab 5: Practical application for some specific manufacturing processes
Week 6	Lab 6: MILLING Process
Week 7	Lab 7: Practical application for some specific manufacturing processes

<table>
<tr><td colspan="3" align="center">**Learning and Teaching Resources**
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td align="center">**Text**</td><td>**Available in the Library?**</td></tr>
<tr><td>**Required Texts**</td><td>Manufacturing Processes by Khurmi</td><td align="center">Yes</td></tr>
<tr><td>**Recommended Texts**</td><td>Manufacturing Processes by Shigly</td><td align="center">Yes</td></tr>
<tr><td>**Websites**</td><td>-----------</td><td></td></tr>
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	Grading Scheme مخطط الدرجات			
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><td colspan="4" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td colspan="2" align="center">Mechanical Drawing</td><td>Module Delivery</td></tr>
<tr><td>Module Type</td><td colspan="2" align="center">BASIC</td><td rowspan="4">☐ Theory
☐ Lecture
☐ Lab
☐ Tutorial
☒ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td colspan="2" align="center">ATU21035</td></tr>
<tr><td>ECTS Credits</td><td colspan="2" align="center">3</td></tr>
<tr><td>SWL (hr/sem)</td><td colspan="2" align="center">75</td></tr>
<tr><td>Module Level</td><td>UG II</td><td>Semester of Delivery</td><td>3</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td>TCM</td></tr>
<tr><td>Module Leader</td><td>Ahmed Ali Alshawk</td><td>e-mail</td><td>ahmed.abdulhussein@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td>Asist. Lecturer</td><td>Module Leader's Qualification</td><td>M.Sc.</td></tr>
<tr><td>Module Tutor</td><td>none</td><td>e-mail</td><td></td></tr>
<tr><td>Peer Reviewer Name</td><td>Hani Mizhir Majid</td><td>e-mail</td><td>hani.magid@atu.edu.iq</td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2023</td><td>Version Number</td><td>1.0</td></tr>
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<table>
<tr><td colspan="4" align="center">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>ATU21015</td><td>Semester</td><td>1</td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
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Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals concepts of Mechanical drawing and its importance in engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The main goals of studying Mechanical drawing are as follows: 1. Understand the classification and application of mechanical components such as screws, keys, pins, rivets, springs, and gears. 2. Gain proficiency in creating assembly drawings, including sectional front views and side views for general assembly. 3. Develop knowledge and skills in tolerances, including basic size, limits of size, deviation, and calculation of fits and tolerances. 4. Learn about surface finishing symbols and their application in mechanical engineering. 5. Acquire an understanding of different welding techniques, including gas welding, arc welding, and resistance welding, along with their basic symbols. 6. Demonstrate the ability to draw various types of gears, including spur gears, bevel gears, and worm and worm wheel. 7. Gain proficiency in creating detailed drawings for mechanical components and assemblies.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Screws - Classifications of Screws, Joining by bolts or screws [4 hours] • Learn about the various types and classifications of screws used in mechanical assemblies. Understand their applications and the principles of joining using bolts or screws. Gain knowledge of different screw threads, head types, and their specific uses in engineering designs. Keys - Classifications of Keys [4 hours] • Explore the classifications of keys and their significance in mechanical systems. Study the types of keys, such as parallel keys, taper keys, and Woodruff keys, and their respective applications. Understand the principles of key selection and how keys are utilized to transmit torque in shaft-to-hub connections. Pins & Rivets - Classifications of Pins & Rivets [4 hours] • Dive into the world of pins and rivets, essential fasteners in mechanical engineering. Learn about the different types of pins, including straight pins, taper pins, and roll pins, and their applications. Understand the classifications of rivets, such as solid rivets and blind rivets, and their use in joining structural components. Springs - Classifications of Springs [4 hours] • Discover the fundamental principles and classifications of springs. Explore various types of springs, including helical springs, leaf springs, and torsion springs. Understand the characteristics and applications of each type, and learn how springs store and release mechanical energy to provide resilience and damping in mechanical systems. Tolerances [4 hours] • Gain an understanding of tolerances in engineering design and manufacturing processes. Learn about basic size, limits of size, and deviation,

and how they influence the dimensional accuracy of components. Explore the significance of tolerances in ensuring proper fit, assembly, and interchangeability of parts in mechanical systems.

Fits [4 hours]

- Explore the concept of fits and their importance in mechanical assemblies. Study different classes of fit, including clearance fit, transition fit, and interference fit, and understand their characteristics and applications. Learn about calculation methods for determining fits and tolerance, enabling proper assembly and functionality of components.

Surface finishing [4 hours]

- Dive into the realm of surface finishing and its impact on the functional and aesthetic aspects of components. Learn about various surface finishing techniques, such as grinding, polishing, and plating. Understand the application of surface finishing symbols in engineering drawings to communicate specific surface requirements for manufacturing processes.

Assembly Drawing - Draw a sectional front view & a side view for general assembly [4 hours]

- Learn the art of creating assembly drawings, focusing on sectional front views and side views. Understand the purpose of assembly drawings in conveying the arrangement and relationships of components in an assembly. Acquire the skills to accurately represent individual parts and their interconnections, allowing for effective communication and ease of assembly.

Assembly Drawing - Draw a sectional front view for general assembly [4 hours]

- Further expand your assembly drawing skills by focusing on sectional front views. Learn techniques to depict internal features and hidden details using section lines and hatching. Develop proficiency in representing assemblies with complex structures, ensuring clarity and precision in the communication of assembly instructions.

Assembly Drawing - Draw a sectional front view for general assembly [4 hours]

- Continue refining your assembly drawing abilities with a continued emphasis on sectional front views. Gain expertise in capturing intricate details, such as fasteners, joints, and interlocking mechanisms. Master the art of presenting assembly drawings that facilitate efficient manufacturing, assembly, and maintenance processes.

Welding - Types of welding, Gas welding, Arc welding, Resistance welding, Basic symbols for welding gas & arc welding [4 hours]

- Delve into the world of welding and explore various welding techniques. Study different types of welding, including gas welding, arc welding, and resistance welding. Understand the principles, applications, and advantages of each welding method. Familiarize yourself with basic welding symbols used to represent welding processes in engineering drawings.

Gears: Spur Gear - Classification of gears, Applications, Drawing of spur gear, Spur gears assembly Drawing [4 hours]

- Focus on gears, starting with spur gears. Learn about the classification of gears based on their tooth profiles, such as spur gears, helical gears, and bevel gears. Explore the applications of spur gears and gain hands-on

experience in drawing spur gears. Additionally, develop skills in creating assembly drawings of spur gear systems, considering gear meshing and alignment.

Bevel gear - Drawing of bevel gear, Bevel gears assembly drawing [4 hours]

- Expand your knowledge of gears with a specific focus on bevel gears. Learn the principles and applications of bevel gears, which are used for transmitting motion between non-parallel shafts. Acquire the skills to accurately draw bevel gears, considering tooth geometry and alignment. Additionally, practice creating assembly drawings that illustrate the arrangement and interaction of bevel gear systems.

Worm and worm wheel - Drawing of worm and worm wheel [4 hours]

- Delve into the world of worm and worm wheel mechanisms. Understand the principles of worm gear systems, their advantages, and applications. Learn the techniques for drawing worm and worm wheel components, paying attention to tooth profiles and their engagement. Develop proficiency in accurately representing these mechanisms, ensuring their proper functionality in engineering designs.

Detailed drawing [4 hours]

- Conclude the course with a focus on detailed drawings. Learn the techniques for creating detailed drawings that provide comprehensive information about individual components. Understand the importance of dimensioning, tolerancing, and annotations to ensure manufacturing accuracy and proper assembly. Gain proficiency in producing detailed drawings that facilitate precise manufacturing processes and support effective communication between design and production teams.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم
Strategies	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)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem)	12	**Unstructured SWL (h/w)**	1

	الحمل الدراسي غير المنتظم للطالب أسبوعيا		الحمل الدراسي غير المنتظم للطالب خلال الفصل
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل		**75**	

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #8, #9
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	-	-		
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي	
	Material Covered
Week 1	**Screws -** Classifications of Screws, Joining by bolts or screws
Week 2	**Keys** - Classifications of Keys
Week 3	**Pins & Rivets** - Classifications of Pins & Rivets
Week 4	**Springs** - Classifications of Springs
Week 5	**Tolerances** • Basic size • Limits of size • Deviation
Week 6	**Fits** • Classes of fit / clearance • Transition • Interference • Calculation of fits & tolerance
Week 7	**Surface finishing**

Week 8	**Assembly Drawing** • - Draw a sectional front view & a side view for general assembly
Week 9	**Assembly Drawing** - Draw a sectional front view for general assembly
Week 10	**Assembly Drawing** - Draw a sectional front view for general assembly
Week 11	**Welding** • Types of welding • Gas welding • Arc welding • Resistance welding Basic symbols for welding gas & arc welding
Week 12	**Gears: Spur Gear** • Classification of gears • Applications • Drawing of spur gear • Spur gears assembly Drawing
Week 13	**Bevel gear** • Drawing of bevel gear • Bevel gears assembly drawing
Week 14	**Worm and worm wheel** • Drawing of warm and worm wheel
Week 15	**Detailed drawing**
Week 16	**Preparatory week before the final Exam**

Application of surface finishing symbols

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الرسم الهندس – عبدالرسول الخفاف	yes
Recommended Texts	Hamad, M., 2019. AutoCAD 2020 3D Modeling. In AutoCAD 2020 3D Modeling. Mercury Learning and Information.	No
Websites	https://www.autodesk.com/education/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A - Excellent**	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	**FX – Fail**	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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<tr><td colspan="5" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td colspan="3" align="center">Fundamentals of Electricity</td><td>Module Delivery</td></tr>
<tr><td>Module Type</td><td colspan="3" align="center">Support</td><td rowspan="4">☒ Theory
☒ Lecture
☒ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td colspan="3" align="center">ATU21037</td></tr>
<tr><td>ECTS Credits</td><td colspan="3" align="center">3</td></tr>
<tr><td>SWL (hr/sem)</td><td colspan="3" align="center">75</td></tr>
<tr><td>Module Level</td><td>UG II</td><td>Semester of Delivery</td><td colspan="2">1</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td colspan="2">TCM</td></tr>
<tr><td>Module Leader</td><td>Badr Kamoon Dabis</td><td>e-mail</td><td colspan="2">com.bdr@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td>LECTUER</td><td>Module Leader's Qualification</td><td colspan="2">M.Sc.</td></tr>
<tr><td>Module Tutor</td><td>Mohammed Abdulameer Khalaf</td><td>e-mail</td><td colspan="2">almuntadher@atu.edu.iq</td></tr>
<tr><td>Peer Reviewer Name</td><td></td><td>e-mail</td><td colspan="2"></td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2024</td><td>Version Number</td><td colspan="2">1.0</td></tr>
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<table>
<tr><td colspan="4" align="center">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
</table>

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals of the study of electric basic circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this course, students will be able to understand and apply the principles of circuit analysis. 1. Fundamental Knowledge: Students will acquire a solid understanding of the fundamental concepts and principles of direct current (DC) circuits, including voltage, current, resistance, power, and energy. 2. 2-Circuit Analysis Skills: Students will develop the ability to analyze DC circuits using various techniques such as applying Kirchhoff's laws, performing nodal and mesh analysis, and utilizing circuit theorems like Thevenin's and Norton's theorem. They will gain proficiency in solving complex circuit problems and calculating circuit parameters. 3. 3-Circuit Design and Simulation: Students will be able to design and simulate DC circuits, using appropriate components and considering design constraints. They will learn to use circuit simulation software to verify their designs, analyze circuit performance, and troubleshoot circuit issues. 4. 4-Laboratory Skills: Through hands-on laboratory experiments, students will develop practical skills in building, testing, and troubleshooting DC circuits. They will become proficient in using measuring instruments, interpreting experimental data, and ensuring safety precautions while working with electrical circuits. 5. 5-Critical Thinking and Analysis: The course will promote critical thinking and analytical skills among students. They will learn to evaluate different circuit solutions, analyze circuit behavior, and make informed decisions based on their understanding of DC circuits. 6. By the end of the course, students will possess a comprehensive knowledge of DC circuits, enabling them to analyze, design, and troubleshoot a wide range of electrical circuits. They will be prepared for further studies in electrical engineering or related fields and equipped with skills that can be applied in professional practice.

Indicative Contents
 	
المحتويات الإرشادية
	Indicative content includes the following:
	• Part A – General Electric System.
	  Constituent parts of an electrical system (source, load, communication & control), Current flow in a circuit, Electromotive force and potential difference, Electrical units.
	  Ohm's law, Resistors, Resistivity, Temperature rise & Temperature coefficient of resistance, Voltage & Current sources [8 hrs]
	• Part B DC circuits.

	Series circuits, Parallel circuits. Kirchhoff's laws. Power and energy [14 hrs]
	• Part C Network Theorems . Star-delta & delta-star transformation. Sources transformations Mesh analysis. Nodal analysis. Superposition theorem. Thevnin's theorem. Norton's theorem. Maximum power transfer theorem. [32 hrs]
	Revision problem classes [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

| Strategies | 1-**Hands-on Experiments:** Engage students in practical experiments to deepen their understanding of circuits.
2-**Simulation Software:** Use circuit simulation software for virtual circuit design and analysis.
3-**Problem-solving Exercises:** Include various problem-solving exercises to apply circuit analysis techniques.
4-**Group Projects:** Assign collaborative projects for circuit design and construction.
5-**Real-world Applications:** Discuss practical applications of circuits in different devices and systems.
5-**Interactive Discussions:** Encourage student participation and critical thinking through open-ended questions.
6-**Conceptual Understanding:** Focus on intuitive understanding alongside mathematical analysis.
7-**Assessment Variety:** Use diverse assessment methods to gauge student understanding.
8-**Office Hours and Support:** Offer individualized assistance through office hours or online support. |

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation				
تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning

					Outcome
Formative assessment	**Quizzes**	4	10% (10)	4, 7, 12 and 14	LO #2, #3 and #8, #12
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #7, #8
	Projects / Lab.	8	10% (10)	Continuous	All
	Report	8	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #9
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Fundamental electric quantities: voltage, current, power and energy
Week 2,3,4	Resistance, capacitance and inductance Dependent and Independent source
Week 5	Series and parallel resistors voltage and current division
Week 6	Kirchhoff's laws (KVL & KCL).
Week 7	Conversion of delta-connected resistance into an equivalent Wye connection & vice versa.
Week 8,9,10	Mesh analysis, Node analysis
Week 11	Superposition's theorem, Thevenin's theorem
Week 12,13	Norton's theorem, Maximum power transfer
Week 14,15	Magnetic circuits
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1, 2	Introduction to Measurement Devices, Color of Resistance
Week 3, 4	Ohm's Law and Resistance in Series and Parallel
Week 5, 6	Star& Delta Connection

Week 7	Kirchhoff's Law
Week 8	**MID-TERM EXAM**
Week 9, 10	Super Position Theorem
Week 11, 12	Thevenin's Theorem
Week 13, 14	Norton's Theorem & Maximum Power Transfer
Week 15	Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	INTRODUCTORY CIRCUIT ANALYSIS, Robert L. Boylestad, Eleventh Edition, 2007	No
Recommended Texts	Fundamentals of Electrical Engineering, Charles K. Alexander, Matthew N.O. Sdiku 4th Edition, 2009	No
Websites	**Direct Current (DC)** https://www.allaboutcircuits.com/textbook/direct-current/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><td colspan="4" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td align="center">Baath Crimes</td><td colspan="2">Module Delivery</td></tr>
<tr><td>Module Type</td><td align="center">Basic</td><td colspan="2" rowspan="4">☒ Theory
☐ Lecture
☐ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td align="center">ATUU211</td></tr>
<tr><td>ECTS Credits</td><td align="center">2</td></tr>
<tr><td>SWL (hr/sem)</td><td align="center">50</td></tr>
<tr><td>Module Level</td><td>UGII</td><td>Semester of Delivery</td><td>3</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td>TCM</td></tr>
<tr><td>Module Leader</td><td>Ruqaya Obaid Ibdewe</td><td>e-mail</td><td></td></tr>
<tr><td>Module Leader's Acad. Title</td><td></td><td>Module Leader's Qualification</td><td>M.sc</td></tr>
<tr><td>Module Tutor</td><td>none</td><td>e-mail</td><td></td></tr>
<tr><td>Peer Reviewer Name</td><td>none</td><td>e-mail</td><td></td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2023</td><td>Version Number</td><td>1.0</td></tr>
</table>

<table>
<tr><td colspan="4" align="center">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
</table>

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. لتعرف على الأحكام القانونية الرئيسية التي تحكم ملاحقة الجرائم بموجب قانون محكمة الجنايات العليا العراقية لعام 2005. 2. تحليل الآثار النفسية على الأفراد والمجتمعات المتأثرة بجرائم نظام البعث. 3. دراسة الآثار الاجتماعية لسياسات وأفعال نظام البعث على المجتمع العراقي. 4. تقييم أبرز الانتهاكات التي ارتكبها نظام البعث، مع التركيز على تأثيرها على حقوق الإنسان. 5. تقييم الأضرار البيئية الناجمة عن نظام البعث في العراق وتأثيرها على الصحة العامة. 6. التحقيق في السياق التاريخي وأهمية القبور الجماعية كدليل على الجرائم المرتكبة خلال عصر البعث. 7. فهم دور القانون الدولي في معالجة جرائم نظام البعث وضمان المساءلة. 8. استكشاف آليات العدالة الانتقالية وأهميتها في التعامل مع إرث فظائع نظام البعث. 9. تعزيز الوعي والفهم بجرائم نظام البعث وتأثيراتها المستمرة على المجتمع العراقي. 10. المساهمة في الحوار حول انتهاكات حقوق الإنسان والعدالة التاريخية في العراق ما بعد نظام البعث
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. أظهر فهماً شاملاً للإطار القانوني المتعلق بملاحقة الجرائم بموجب قانون محكمة الجنايات العليا العراقية لعام 2005. 2. قم بتحليل الأثر النفسي للفظائع التاريخية على الأفراد والمجتمعات في سياق نظام البعث في العراق. 3. قم بتقييم الآثار الاجتماعية لسياسات وأفعال نظام البعث، وتأثيراتها المستمرة على المجتمع العراقي بنقد بناء. 4. قم بتقييم تأثير انتهاكات حقوق الإنسان الجسيمة التي ارتكبت خلال نظام البعث على النسيج السياسي والاجتماعي الأوسع في العراق. 5. قم بتقييم العواقب البيئية لأفعال نظام البعث في العراق، مع التركيز على فهم التأثيرات على الموارد الطبيعية والصحة العامة. 6. قم بتفسير الأهمية التاريخية للقبور الجماعية كدليل على الجرائم المرتكبة خلال عصر البعث في العراق. 7. ضع معرفتك بآليات القانون الدولي لتقييم مساءلة نظام البعث عن جرائمه بموجب القانون الدولي. 8. قم بتحليل فعالية آليات العدالة الانتقالية في التعامل مع ما خلفه انتهاكات حقوق الإنسان خلال نظام البعث. 9. قم بتقييم التأثير السياسي والاجتماعي والثقافي لجرائم نظام البعث في تشكيل المجتمع والسياسة العراقية المعاصرة. 10. ابن حججًا مستندة لتوضيح ضرورة العدالة التاريخية وتعزيز حقوق الإنسان في مرحلة ما بعد عصر البعث في العراق
Indicative Contents المحتويات الإرشادية	مفهوم الجرائم واقسامها , تعريف الجريمة لغة واصطلاحا, جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 م , أنواع الجرائم الدولية, الجرائم النفسية ,اليات الجرائم النفسية, الجرائم الاجتماعية, موقف المظام البعثي من الدين, انتهاكات القوانين العراقية, الجرائم البيئية لنظام العث في العراق, التلوث الحربي والاشعاعي وانفجار الألغام, تجفيف الاهوار, جرائم المقابر الجماعية, احداث مقابر الإبادة الجماعية, التصنيف الزمني لمقابر الإبادة الجماعية

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	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)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	18	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3,5,10 and 12	LO #1, #2 and #10, #11
	Assignments	2	20% (10)	5,7, 9and 13	LO #3, #4 and #6, #7
	Projects / Lab.	0	10% (10)	-----	----
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

الاسبوع	الموضوع Week	
1-2	مفهوم الجرائم واقسامها	
3	تعريف الجريمة لغة واصطلاحا	
4-5	جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 م	
6	أنواع الجرائم الدولية- اليات الجرائم النفسية	
7	امتحان الفصل الاول(المد)	
8	الجرائم الاجتماعية	
9	موقف المظام البعثي من الدين	
10	انتهاكات القوانين العراقية	
11	الجرائم البيئية لنظام العث في العراق	
12-13	التلوث الحربي والاشعاعي وانفجار الألغام	
14	تجفيف الاهوار- جرائم المقابر الجماعية	
15	**Preparatory week before the final Exam**	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	جرائم نظام البعث في العراق	Yes
Recommended Texts	None	No
Websites	None	

4

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><th colspan="5">Module Information
معلومات المادة الدراسية</th></tr>
<tr><td>Module Title</td><td colspan="2">Strength of Materials - Application</td><td colspan="2">Module Delivery</td></tr>
<tr><td>Module Type</td><td colspan="2">Core</td><td colspan="2" rowspan="4">☒ Theory
☐ Lecture
☒ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td colspan="2">ATU21041</td></tr>
<tr><td>ECTS Credits</td><td colspan="2">5</td></tr>
<tr><td>SWL (hr/sem)</td><td colspan="2">125</td></tr>
<tr><td>Module Level</td><td colspan="2">UG II</td><td>Semester of Delivery</td><td>4</td></tr>
<tr><td>Administering Department</td><td colspan="2">MET</td><td>College</td><td>TCM</td></tr>
<tr><td>Module Leader</td><td colspan="2">Kussay Ahmed Subhi</td><td>e-mail</td><td>kussaysubhi@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td colspan="2">Lecturer</td><td>Module Leader's Qualification</td><td>Ph.D</td></tr>
<tr><td>Module Tutor</td><td colspan="2">Badr Kamoon Dabis</td><td>e-mail</td><td>com.bdr@atu.edu.iq</td></tr>
<tr><td>Peer Reviewer Name</td><td colspan="2"></td><td>e-mail</td><td></td></tr>
<tr><td>Scientific Committee Approval Date</td><td colspan="2">12/06/2023</td><td>Version Number</td><td>1.0</td></tr>
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<table>
<tr><th colspan="4">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</th></tr>
<tr><td>Prerequisite module</td><td>ATU21031</td><td>Semester</td><td>3</td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
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	Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To understand the basic theories of the Strength of Materials theories and develop a method in problem-solving skills through some application of techniques. 2. To understand the important material properties and their effects on material strength. 3. To lay out a procedure that enables students to calculate and solve the exercises in this course.	
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Describe the criteria used in specifying the material's strength. 2. Explain the importance of calculating stress-strain effects on material failure. 3. Identify the effect of the stress concentration and its effects on the material's strength. 4. Discuss the principle of failure mode due to the effects of thermal stresses. 5. Explain the effects of stiffness, hooks law, strain, and strain ratio on the material behavior. 6. Identify the principle of the poison ratio.	
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A – Principals in the strength of material's [60 hrs]** Introduction to Analysis of Stresses in beams, Beam deflections, Deflection in simply supported beams, Deflection of cantilever beams, Columns, Critical load for columns, Buckling in columns, Combined stresses, Mohr's circle, and Application of Mohr's circle. **Part B – Experimental Test [30 hrs]** Tensile Test, Torsion test, Bending test, Fatigue Test, Impact Test.	

	Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The adopted strategy for this module is to enhance the student's ability and increase their understanding of calculations skills and expand their critical thinking skills. Students will participate in the exercises, while at the same time will be able to achieve interactive tutorials by considering types of simple experiments involving some sampling activities that are interesting to the students. Also, Students will join the lab to do some experiments and tests.	

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	Continuous	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to the Strength of Materials. Analysis of internal forces.
Week 2	Sections of beams.
Week 3	Shear Stresses in beams.
Week 4	Shear center.
Week 5	Stresses in members.
Week 6	Shearing force & bending moment.
Week 7	Bending moment, S.F. & B.M. diagrams.
Week 8	Principal stresses in beam.
Week 9	Principal strains in beam.

Week 10	Stresses in beams, and Beam deflections.
Week 11	Deflection in simply supported beams.
Week 12	Critical load for columns.
Week 13	Buckling in columns.
Week 14	Combined stresses.
Week 15	Statically indeterminate beam.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Mechanics of Materials. Eighth Edition** **By: R.C. HIBBELER**	No
Recommended Texts	**STRENGTH OF MATERIALS** **By: F.L. Singer, and A. Pytel**	No
Websites	https://www.academia.edu/9407986/_Strength_of_Materials_4th_Edition_by_Ferdinand_L_Singer_and_Andrew_Pytel_	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A - Excellent**	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX – Fail**	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Thermodynamics - Applictions	**Module Delivery**	
Module Type	**Core**	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21042		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		
Module Level	UG II	**Semester of Delivery**	4
Administering Department	MET	**College**	TCM
Module Leader	Kadhim Fadhil Nasir	**e-mail**	kad2020@atu.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU21032	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	

Module Objectives أهداف المادة الدراسية	1. To understanding the basic principles and concept *of* thermodynamics. 2. To understand the kinds of energy, process , system, cycles, power, pure substance , ideal gas . 3. This course deals with the basic concept of heat and work. 4. To present a wealth of real-world engineering examples to give students a feel for how thermodynamics is applied in engineering practice 5. To develop an intuitive understanding of thermodynamics by emphasizing the physics and physical arguments. 6. This is the basic subject for gas and vapor power cycles. 7. Teaching students how to work the heat engine in thermal power plants
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Draw the diagram for heat engine. 2. List the main components of heat engine. 3. list the main component of refrigerator . 4. write the law of unsteady state process. 5. Define the Clausius statement. 6. Discuss the Air standard Cycles. 7. Draw the T-s diagram for Rankine cycle. 8. Explain the phase change process of pure substance.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Energy Analysis of Unsteady-Flow Processes The second law of thermodynamics (heat engines, refrigerators , heat pump) and solve problems Entropy, the entropy change in pure substance , the entropy change in ideal gas, adiabatic(isentropic) process and solve problems Cycles, gas power cycle, vapor power cycle, otto cycle, diesel cycle, Rankine cycle, Brayton cycle and solve problems

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #3, #5 and #9, #6
	Assignments	2	10% (10)	4 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment		100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

	المنهاج الاسبوعي النظري	
	Material Covered	
Week 1	Energy Analysis of Unsteady-Flow Processes	
Week 2	Energy Analysis of Unsteady-Flow Processes	
Week 3	The Second law of Thermodynamics, Heat engine	
Week 4	Refrigerators	
Week 5	Heat Pumps	
Week 6	Carnot cycle	
Week 7	Mid-Term + Entropy, for ideal gas and for vapour	
Week 8	Entropy, for ideal gas and for vapour	
Week 9	Air standard Cycles,	
Week 10	Otto cycle	
Week 12	Diesel cycle	
Week 13	Dual cycle	
Week 14	Brayton's cycle	
Week 15	Steam power plants- Rankin Cycle	
Week 16	**Preparatory week before the final Exam**	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Lab 1: The relationship between pressure and saturation temperature of water vapor
Week 3-4	Lab 2: Saybolt viscometer
Week 5	Lab 3: Sensible heat and latent heat
Week 6	Lab 4: specific heat
Week 7	Lab 5: Heat pump

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thermodynamic an engineering approach, eight editio, Yunus A. Cengel and Michael A. Boles	NO

Recommended Texts	Applied thermodynamics for engineering technologists, A. Mc Conky and T.D. Eastop	No
Websites	https://www.amazon.com/Thermodynamics-Engineering-Approach-Textbook-Hardcover/dp/B0722G5SQC	

Grading Scheme مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><td colspan="4" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td colspan="2">Fluid Mechanics - Dynamics</td><td>Module Delivery</td></tr>
<tr><td>Module Type</td><td colspan="2" align="center">Core</td><td rowspan="4">☒ Theory
☐ Lecture
☒ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td colspan="2" align="center">ATU21043</td></tr>
<tr><td>ECTS Credits</td><td colspan="2" align="center">5</td></tr>
<tr><td>SWL (hr/sem)</td><td colspan="2" align="center">125</td></tr>
<tr><td>Module Level</td><td>UG II</td><td>Semester of Delivery</td><td>4</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td>TCM</td></tr>
<tr><td>Module Leader</td><td>Hasan Ali Jurmut</td><td>e-mail</td><td>hasan.jurmut@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td>Assist. Prof.</td><td>Module Leader's Qualification</td><td>Ph.D.</td></tr>
<tr><td>Module Tutor</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Peer Reviewer Name</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2023</td><td>Version Number</td><td>1.0</td></tr>
</table>

<table>
<tr><td colspan="4" align="center">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>ATU21033</td><td>Semester</td><td>3</td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
</table>

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals of the study properties of fluid at motion , flow in pipe, momentum, dimensional analysis**.** .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this course, students will be able to understand and apply the principles of Engineering Mechanics. 1.Understand the fundamental of fluid in motion: Understand the fundamental of fluid in motion: Students will grasp the basic principles of fluid mechanics, including such asstream lines, stream tube, path lines, streak lines and time lines. 2.velocity and acceleration: Students will be able to determine such as velocity and acceleration. 3. flow of an incompressible ideal fluid: drive Bernoulli's equation. 4. exercise problems:calculate the exercise problems of Bernoulli's equation 5. hydraulic grade line (H.G.L): Students will be able to calculate the general questions. 6. Energy line:Students will be able to the diarection of fluid. 7.Hydrostatic force on surface , Students will be able to calculate the forces on carves. 8. frictional flow: For a real fluid with no machine the heads of two sections of incompressible fluid**.** 9.Problems solve: Students will be able to calculate the general questions of fluid with machine. 10. power consideration in fluid flow:Students will be able to calculate The machine power. 11. jet trajectory: Students will be able to calculate the velocity and the angles. 12. momentum and forces in fluid flow:Understand the Kinematics of Fluid flow of momentum and forces in fluid flow. 13. dimensional analysis: Understand the Kinematics of Fluid flow of momentum and dimensional analysis.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

	Part A – Introduction to Analyze fluid mechanics (motiom):
	1. Introduction to fluid flow:

	• Definition and properties of fluid in motion engineering
	    • Bernoulli's equation.
	    • Approaches of fluid mechanics.
	    • [4 hrs]

	2. velocity and acceleration:
	• determine such as velocity . • determine such as acceleration. • Problems .
	[6 hrs]
	3. flow of an incompressible ideal fluid:

	• flow without frection.
	    • Drive Bernoulli's equation.
	    • Calculation problems.
	    • [8 hrs]

	4. hydraulic grade line:

	• Classification the hydraulic grade line.
	    • Direction of flow.
	    • Force on carve.
	    • Energy line.
	    • [6 hrs]

	5. frictional flow:

	• Introduction to frictional flow.
	    • Laws of frictional flow
	    • Flow without machine.
	    • Calculation the problemes.
	    • [8 hrs]

	6. Power consideration in fluid flow:

	• Pump .
	    • Efficiency of pump.
	    • Drive the equations.
	    • Calculate the problems.
	    • [8 hrs]

	7. jet trajectory:

	• Introduction in fluid flow with jet.
	    • velocity.
	    • acceleration .
	    • Calculate the problems.
	    • [8 hrs]

	8. Equation of momentum:

	• Introduction and analysis.
	    • Drive of equation .
	    • Drive the equation of continuity
	    • Force acting in X,Y
	    • [8 hrs]

	9. dimensional analysis [4 hrs]
	Part B – Fluid Mechanic Lab: [30 hrs]
	Part C – Fluid Mechanic Tutorial: [15 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	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)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	4, 7, 12 and 14	LO #2, #4 and #10, #15
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
	Midterm Exam	2hr	10% (10)	7	LO #1 - #7

Summative assessment	**Final Exam**	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Fluid Covered
Week 1	Introduction to fluid flow.
Week 2	velocity and acceleration.
Week 3	flow of an incompressible ideal fluid.
Week 4	hydraulic grade line
Week 5	Friction flow .
Week 6	Head losses.
Week 7	MID-TERM + Power consideration in fluid flow with pump.
Week 8	Power consideration in fluid flow .
Week 9	Efficiency of pump .
Week 10	jet trajectory.
Week 11	Equation of momentum.
Week 12	Calculation the force in vertical.
Week 13	Calculation the force in horizontal.
Week 14	Dimensional amylases.
Week 15	Buckingham Pi Theorem in Dimensional amylases.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1-3	Lab 1: Introduction to fluid motion .
Week 4-5	Lab 2: Bernoulli's equation.
Week 6-7	Lab 3: Reynolds Number.
Week 8-9	Lab 4: losses
Week 10-11	Lab 5: frication
Week 12-13	Lab 6: jet
Week 14-15	Lab 7: different jet

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Franzini Fluid mechanics 10 edition	Yes
Recommended Texts		No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A - Excellent**	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX – Fail**	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**Industrial Automation**		**Module Delivery**	
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ATU21044			
ECTS Credits	5			
SWL (hr/sem)	**125**			
Module Level	UG II	**Semester of Delivery**		4
Administering Department	MET	**College**	TCM	
Module Leader	Haider Fawzi Mahmood	**e-mail**	haider.fawzi@atu.edu.iq	
Module Leader's Acad. Title	LECTUER	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To teach the fundamentals of the study of design, and integrate mechanical and electronic systems
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand fundamental principles of mechanical engineering and electronics. 2- Identify and describe key components and functions of mechanical and electronic systems. 3- Comprehend the integration and interaction between mechanical and electronic elements. 4- Gain knowledge of mechanical components, mechanisms, and their applications. 5- Analyze and evaluate mechanical systems based on principles of force, motion, and energy transfer. 6- Apply design and analysis techniques to develop efficient and reliable mechanical systems. 7- Acquire a solid understanding of electronic components and their properties. 8- Design and analyze basic electronic circuits using digital and analog principles. 9- Explore sensors, actuators, and signal processing techniques for electronic systems. 10- Comprehend the concept of mechatronics and its importance in integrated systems. 11- Design and control electromechanical systems using feedback control principles. 12- Program and interface microcontrollers for mechatronic applications. 13- Learn methods for integrating mechanical and electronic components into functional systems. 14- Understand signal conditioning, data acquisition, and communication protocols. 15- Develop skills in human-machine interface design and implementation. 16- Explore various fields where mechanical and electronic systems are applied, such as robotics, automation, automotive engineering, aerospace, biomedical devices, and consumer electronics. 17- Analyze case studies and real-world examples to understand challenges and opportunities in these application domains. 18- Apply acquired knowledge to propose innovative solutions for specific application areas. 19- Gain hands-on experience through laboratory sessions and projects. 20- Apply theoretical knowledge to practical scenarios and problem-solving tasks. 21- Develop skills in troubleshooting, calibration, and maintenance of

	mechanical and electronic systems.

Indicative Contents
المحتويات الإرشادية
	Indicative Contents of the course on Mechanical and Electronic Systems:
	
	Module 1: Introduction to Mechanical and Electronic Systems (4 hours)
	  1- Overview of mechanical engineering and electronics
	  2- Principles and concepts of mechanical and electronic systems
	  3- Integration and interaction between mechanical and electronic components
	Module 2: Mechanical Systems (10 hours)
	  1- Components of mechanical systems (gears, pulleys, linkages, etc.)
	Force, motion, and energy transfer in mechanical systems
	  2- Mechanical design and analysis techniques
	Module 3: Electronic Systems (12 hours)
	  1- Basic electronic components (resistors, capacitors, transistors, etc.)
	  2- Circuit design principles
	  3- Digital and analog electronics
	  4- Sensors, actuators, and signal processing
	Module 4: Mechatronics (12 hours)
	  1- Introduction to mechatronics and its applications
	  2- Feedback control systems in mechatronics
	  3- Microcontrollers and programming for mechatronic systems
	  4- Interfacing techniques for integrating mechanical and electronic elements
	Module 5: System Integration and Interfacing (10 hours)
	  1- Signal conditioning and data acquisition
	  2- Communication protocols (serial, parallel, wireless, etc.)
	  3- Human-machine interfaces
	  4- Troubleshooting, calibration, and maintenance of integrated systems
	
	Module 6: Application Domains (10 hours)
	  1- Robotics and automation
	  2- Automotive engineering
	  3- Aerospace systems
	  4- Biomedical devices and healthcare technology
	  5- Consumer electronics and smart devices
	  6- Case studies and real-world examples in each application domain

	Module 7: Laboratory Sessions and Projects (5 hours)
	1- Hands-on experiments and demonstrations
	2- Design projects involving mechanical and electronic systems
	3- Simulation and modeling of integrated systems
	4- Practical skills in troubleshooting and system optimization

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The course on Mechanical and Electronic Systems employs lectures, hands-on laboratory sessions, design projects, case studies, simulations, group discussions, guest lectures, online resources, assessments, and field trips to facilitate student learning. Through these strategies, students gain theoretical knowledge, practical skills, and real-world insights into the integration and application of mechanical and electronic components, fostering critical thinking, problem-solving, and collaborative abilities essential in this multidisciplinary field.

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	4, 7, 12 and 14	LO #2, #4 and #10, #15
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7

	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Mechanical and Electronic Systems Overview of the course and its objectives
Week 2	Introduction to Mechanical and Electronic Systems Overview of the course and its objectives
Week 3	Mechanical Design and Analysis Techniques Case Study: Mechanical System Analysis
Week 4	Electronic Systems: Components and Properties Circuit Design Principles
Week 5	Digital and Analog Electronics Sensors and Actuators
Week 6	Signal Processing Techniques Case Study: Electronic System Design
Week 7	Mechatronics: Concepts and Applications Feedback Control Systems
Week 8	Microcontrollers and Programming for Mechatronic Systems Interfacing Techniques
Week 9	System Integration and Interfacing Methods Communication Protocols
Week 10	Human-Machine Interfaces Troubleshooting and Maintenance of Integrated Systems
Week 11	Application Domain: Robotics and Automation Case Study: Robotic System Integration
Week 12	Application Domain: Automotive Engineering Case Study: Automotive Electronics Integration
Week 13	Application Domain: Aerospace Systems Case Study: Avionics Integration
Week 14	Application Domain: Biomedical Devices and Healthcare Technology Case Study: Medical Instrumentation Integration
Week 15	Application Domain: Consumer Electronics and Smart Devices Final Project Presentations and Wrap-up
Week 16	Preparatory week before the final Exam

	Delivery Plan (Weekly Lab. Syllabus)
	المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Lab Safety and Equipment Familiarization with Mechanical and Electronic Components
Week 2	Experiment: Gear Systems and Power Transmission Measurement and Analysis of Mechanical Forces
Week 3	Experiment: Circuit Design and Analysis Introduction to Electronic Measurement Instruments
Week 4	Experiment: Sensor Calibration and Testing Data Acquisition and Signal Processing Techniques
Week 5	Experiment: Actuator Control and Interfacing Introduction to Microcontrollers and Programming
Week 6	Experiment: Closed-loop Control Systems Programming Microcontrollers for Mechatronic Applications
Week 7	Experiment: System Integration and Interfacing Techniques Communication Protocols and Network Integration
Week 8	Experiment: Human-Machine Interface Design User Interaction and Control Systems
Week 9	Experiment: Troubleshooting and Maintenance of Integrated Systems Fault Finding and System Optimization Techniques
Week 10	Experiment: Robotics and Automation Systems Control and Programming of Robotic Manipulators
Week 11	Experiment: Automotive Electronics Integration Vehicle Sensor Systems and Control Interfaces
Week 12	Experiment: Avionics Integration Aircraft Instrumentation and Control Systems
Week 13	Experiment: Biomedical Device Integration Medical Sensors and Data Acquisition
Week 14	Experiment: Consumer Electronics Integration Smart Devices and Internet of Things (IoT) Integration
Week 15	Final Project: Design and Implementation of an Integrated System Demonstration and Presentation of Final Projects

	Learning and Teaching Resources	
	مصادر التعلم والتدريس	
	Text	Available in the Library?
Required Texts		
Recommended Texts	- Onwubolu, G., 2005. Mechatronics: principles and applications. Elsevier.	No

	- Bolton, W., 2003. Mechatronics: electronic control systems in mechanical and electrical engineering. Pearson Education. - Wujek, J.B. and Dagostino, F.R., 2011. Mechanical and electrical systems in architecture, engineering and construction. Pearson Higher Ed. - Alciatore, D.G. and Histand, M.B., 2007. Introduction to mechatronics and measurement systems (Vol. 3). New York: McGraw-Hill. - Grondzik, W.T. and Kwok, A.G., 2019. Mechanical and electrical equipment for buildings. John wiley & sons.	
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><td colspan="4" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td>Computer Aided Manufacturing (CAM)</td><td colspan="2">Module Delivery</td></tr>
<tr><td>Module Type</td><td>Support</td><td colspan="2" rowspan="4">☒ Theory
☐ Lecture
☒ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td>ATU21036</td></tr>
<tr><td>ECTS Credits</td><td>3</td></tr>
<tr><td>SWL (hr/sem)</td><td>75</td></tr>
<tr><td>Module Level</td><td>UG II</td><td>Semester of Delivery</td><td>3</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td>TCM</td></tr>
<tr><td>Module Leader</td><td>Haider Fawzi Mahmood</td><td>e-mail</td><td>haider.fawzi@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td>LECTUER</td><td>Module Leader's Qualification</td><td>Ph.D.</td></tr>
<tr><td>Module Tutor</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Peer Reviewer Name</td><td>Hiyam Adil Habeeb</td><td>e-mail</td><td>hiyamadil84@atu.edu.iq</td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2023</td><td>Version Number</td><td>1.0</td></tr>
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<table>
<tr><td colspan="3" align="center">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
</table>

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	students will have achieved a solid understanding of Surfcam software and its applications in Computer-Aided Manufacturing. They will be able to generate optimized toolpaths, simulate machining operations, and produce CNC programs tailored to specific manufacturing requirements, thereby enhancing productivity and efficiency in modern manufacturing processes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the features, interface, and file management in Surfcam. 2. Create and manipulate 2D and 3D models using Surfcam. 3. Generate accurate and efficient toolpaths for milling, turning, and drilling operations. 4. Optimize toolpaths with advanced features, collision detection, and material removal simulation. 5. Convert toolpaths into machine-specific code through post-processing and customize post-processors. 6. Simulate and verify machining operations for error-free programs. 7. Apply Surfcam skills to real-world manufacturing scenarios through hands-on exercises and projects. 8. Learn industry-standard practices for efficient CAM using Surfcam. 9. Develop problem-solving and troubleshooting skills for CAM processes. 10. Complete a comprehensive project demonstrating proficiency in Surfcam and CAM principles.
Indicative Contents المحتويات الإرشادية	Indicative Contents and Time Allocation for the Computer-Aided Manufacturing (Surfcam) Course: **1- Introduction to Surfcam (4 hours)** - Overview of Surfcam software - User interface and navigation - File management and customization **2- 2D and 3D Modeling (12 hours)** - Creating 2D sketches and profiles - Extruding, revolving, and sweeping 2D profiles - Creating and modifying 3D models - Importing and exporting CAD files **3- Toolpath Generation (16 hours)** - Understanding machining operations - Creating toolpaths for milling operations - Generating toolpaths for turning operations - Toolpath optimization techniques **4- Toolpath Optimization (10 hours)** - Editing toolpaths and parameters

- Collision detection and avoidance
- Simulating material removal operations
- Fine-tuning toolpaths for efficiency

5- Post-processing and CNC Integration (10 hours)
- Post-processing concepts and principles
- Customizing post-processors for CNC machines
- Generating machine-specific code
- Verifying and adjusting post-processed programs

6- Machine Simulation and Verification (10 hours)
- Simulating machining operations
- Verifying toolpaths and programs
- Detecting and resolving errors
- Optimal machine setup and simulation practices

7- Real-world Applications (12 hours)
- Hands-on exercises and projects
- Applying Surfcam skills to practical scenarios
- Solving manufacturing challenges using CAM techniques

8- Industry Best Practices (4 hours)
- Efficient CAM strategies and methodologies
- Industry standards and guidelines
- Optimizing workflows and processes

9- Problem Solving and Troubleshooting (4 hours)
- Analyzing and addressing common CAM problems
- Troubleshooting toolpath and program errors
- Debugging and optimizing CAM processes

10- Project Completion (6 hours)
- Applying acquired knowledge and skills to a comprehensive project
- Demonstrating proficiency in Surfcam and CAM principles

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The course utilizes a combination of learning and teaching strategies, including lectures, hands-on exercises, practical projects, and interactive discussions. Students will engage in active learning by working with Surfcam software, practicing toolpath generation, and simulating machining operations. The instructor will provide guidance, demonstrations, and feedback, fostering a collaborative learning environment. Real-world applications and industry best practices will be emphasized, promoting critical thinking and problem-solving skills.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	12	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل		**75**	

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	4, 7, 12 and 14	LO #2, #4 and #10, #15
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Surfcam Overview of Surfcam software User interface and navigation
Week 2	Introduction to Surfcam Overview of Surfcam software

	User interface and navigation
Week 3	2D and 3D Modeling (continued) Creating and modifying 3D models Importing and exporting CAD files
Week 4	Toolpath Generation Understanding machining operations Creating toolpaths for milling operations
Week 5	Toolpath Generation (continued) Generating toolpaths for turning operations
Week 6	Toolpath Optimization Editing toolpaths and parameters
Week 7	Toolpath Optimization (continued) Collision detection and avoidance
Week 8	Post-processing and CNC Integration Post-processing concepts and principles Customizing post-processors for CNC machines
Week 9	Machine Simulation and Verification Simulating machining operations Verifying toolpaths and programs
Week 10	Real-world Applications (Hands-on exercises and projects
Week 11	Real-world Applications (continued) Applying Surfcam skills to practical scenarios
Week 12	Industry Best Practices Efficient CAM strategies and methodologies
Week 13	Problem Solving and Troubleshooting Analyzing and addressing common CAM problem
Week 14	Project Completion Applying acquired knowledge and skills to a comprehensive project
Week 15	Project Completion (continued) Demonstrating proficiency in Surfcam and CAM principles
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Lab: Introduction to Surfcam** - Exploring the Surfcam user interface - Navigating the software and customizing settings
Week 2	**Lab: 2D Sketching and Modeling** - Creating 2D sketches and profiles in Surfcam - Extruding, revolving, and sweeping 2D profiles
Week 3	**Lab: 3D Modeling** - Creating and modifying 3D models in Surfcam

	- Importing and exporting CAD files
Week 4	**Lab: Milling Toolpath Generation** - Creating toolpaths for milling operations in Surfcam
Week 5	**Lab: Turning Toolpath Generation** - Generating toolpaths for turning operations in Surfcam
Week 6	**Lab: Toolpath Optimization** - Editing and optimizing toolpaths in Surfcam
Week 7	**Lab: Collision Detection and Avoidance** - Implementing collision detection techniques in Surfcam
Week 8	**Lab: Post-processing and CNC Integration** - Customizing post-processors for CNC machines in Surfcam
Week 9	**Lab: Machine Simulation and Verification** - Simulating and verifying toolpaths and programs in Surfcam
Week 10	**Lab: Real-world Applications** - Hands-on exercises and projects applying Surfcam skills
Week 11	**Lab: Real-world Applications (continued)** - Further practice with practical Surfcam scenario
Week 12	**Lab: Industry Best Practices** - Implementing efficient CAM strategies and methodologies
Week 13	**Lab: Problem Solving and Troubleshooting** - Addressing common CAM problems and errors in Surfcam
Week 14	**Lab: Project Completion** - Applying acquired skills to a comprehensive project
Week 15	**Lab: Project Completion (continued)** - Finalizing and presenting the Surfcam project

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts	- Puttre, M., 1994. CAD/CAM on a budget. Mechanical Engineering-CIME, 116(12), pp.66-68.	No

	- Smid, P., 2003. CNC programing handbook: a comprehensive guide to practical CNC programming. Industrial Press Inc.. - Smid, P., 2006. CNC programming techniques: an insider's guide to effective methods and applications. Industrial Press Inc..	
Websites	- http://www.surfcam.com/ - http://www.youtube.com/user/surfcamvideos	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**English Language (II)**		**Module Delivery**	
Module Type	Support		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	**ATUU212**			
ECTS Credits	**2**			
SWL (hr/sem)	**50**			
Module Level	UG II	**Semester of Delivery**		4
Administering Department	MET	**College**	TCM	
Module Leader	Shaymaa AbdulKhader Hamzah	**e-mail**	shaimaaal-jumaili@atu.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	01/06/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ATU21016	**Semester**	1
Co-requisites module	None	**Semester**	

	Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية
Module Objectives أهداف المادة الدراسية	1. To improve the level of students at this level in English using multiple means. 2. To understand the main rules of writing, especially for writing lab reports or graduation projects. 3. This course is concerned with presenting the main principles of the English language at this stage of study. 4. This course is concerned with introducing students to the main concepts of writing, reading, speaking and listening. 5. This course will raise the level of the student in the English language in all academic and general language modes, to be prepared for the next level.. 6. It will achieve the possibility for the student to write a short article as well as the ability to read for various scientific and general topics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. know how *to use Present simple tense* and how to make questions and negative sentences . 2. know how *to use continuous Present tense* and how to make questions and negative sentences. 3. know how *to use past simple tense* and how to make questions and negative sentences. 4. Know how to use expressions of quantities for countable and uncountable nouns. 5. Know how to use verb patterns and forms for positive and negative sentences. 6. Know how to use comparative and superlative adjectives. 7. know how *to use present perfect tense* and how to make questions and negative sentences. 8. Know how to read academic and general articles and answer the questions. 9. Know how to use the strong and mild obligations. 10. Know how to use Active and Passive Voice for all tenses. 11. Know how to write essay for important topics. 12. Know how to speak about the general and academic topics.

	Indicative content includes the following.
Indicative Contents المحتويات الإرشادية	**Getting to know you**: Tenses - Questions Using a bilingual, dictionary, and Social expressions. [1 hr] **The way we live:** Present tenses, *have/have got* • Collocation- daily life • Making conversation. [1 hr] **It all went wrong:** Past tenses • Word formation • Time expressions. [1 hr] **Let's go shopping:** *much/many* • *some/any* • *a few, a little, a lot of* • Articles • Shopping • Prices. [1 hr] **What do you want to do?**: Verb patterns 1 • Future forms • Hot verbs • How do you feel? [1 hr] **Tell me! What's it like?**: *What …like?* • Comparatives and superlatives • Synonyms and antonyms • Directions . [1 hr] **Famous couples**: Present Perfect • *for, since* • Adverbs, word pairs • Short answers [1 hr] **Do's and Don'ts:** Have (got) to * should / must * words that go together * At the doctor [1 hr] **Going places:** Time if hot words in a hotel [1 hr] **Scared to death :** Verb patterns 2 - mange to, used to - -ed/-ing adjectives - exclamations [1 hr] **Things that changed the world:** Passives - verbs and nouns that go together - notices [1 hr] **Dreams and reality:** Second conditional - might – phrasal verbs - social expressions [1 hr] **Earning a living :** Present perfect continuous - word formation - adverbs - Telephoning [1 hr] **Love you and leave you:** Past perfect - reported statements - saying goodbye [1 hr] With all the topics above, the student is implicitly learnt the four different modules of the English language (speaking, listening, writing, and reading).

<table>
<tr><td colspan="2" align="center">**Learning and Teaching Strategies**
استراتيجيات التعلم والتعليم</td></tr>
<tr><td>**Strategies**</td><td>The main strategy that will be adopted in this lesson is to teach the student the main principles and rules used in constructing sentences that are used in different situations, and work to encourage students to write and speak in groups in order to raise language skills and improve listening skill as well. This will be achieved through interactive educational patterns and means, and by encouraging students to write about topics of interest to students.</td></tr>
</table>

<table>
<tr><td colspan="4" align="center">**Student Workload (SWL)**
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا</td></tr>
<tr><td>**Structured SWL (h/sem)**
الحمل الدراسي المنتظم للطالب خلال الفصل</td><td>33</td><td>**Structured SWL (h/w)**
الحمل الدراسي المنتظم للطالب أسبوعيا</td><td>2</td></tr>
<tr><td>**Unstructured SWL (h/sem)**
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td><td>17</td><td>**Unstructured SWL (h/w)**
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td><td>1</td></tr>
<tr><td>**Total SWL (h/sem)**
الحمل الدراسي الكلي للطالب خلال الفصل</td><td colspan="3" align="center">**50**</td></tr>
</table>

<table>
<tr><td colspan="6" align="center">**Module Evaluation**
تقييم المادة الدراسية</td></tr>
<tr><td></td><td></td><td>**Time/Number**</td><td>**Weight (Marks)**</td><td>**Week Due**</td><td>**Relevant Learning Outcome**</td></tr>
<tr><td rowspan="4">**Formative assessment**</td><td>**Quizzes**</td><td>2</td><td>10% (10)</td><td>5 and 10</td><td>LO #1, #2 and #10, #11</td></tr>
<tr><td>**Assignments**</td><td>2</td><td>10% (10)</td><td>2 and 12</td><td>LO #3, #4 and #6, #7</td></tr>
<tr><td>**Projects / Lab.**</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>**Report**</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">**Summative assessment**</td><td>**Midterm Exam**</td><td>2hr</td><td>30% (10)</td><td>7</td><td>LO #1 - #7</td></tr>
<tr><td>**Final Exam**</td><td>3hr</td><td>50% (50)</td><td>16</td><td>All</td></tr>
<tr><td colspan="2">**Total assessment**</td><td colspan="2" align="center">100% (100 Marks)</td><td></td><td></td></tr>
</table>

<table>
<tr><td colspan="2" align="center">**Delivery Plan (Weekly Syllabus)**
المنهاج الاسبوعي النظري</td></tr>
<tr><td></td><td>**Material Covered**</td></tr>
<tr><td>**Week 1**</td><td>using Present simple tense and how to make questions and negative sentences</td></tr>
</table>

Week 2	using continuous Present tense and how to make questions and negative sentences
Week 3	using past simple tense and how to make questions and negative sentences
Week 4	using expressions of quantities for countable and uncountable nouns
Week 5	using verb patterns and forms for positive and negative sentences
Week 6	using comparative and superlative adjectives
Week 7	Midterm exam
Week 8	reading academic and general articles and answer the questions
Week 9	using the strong and mild obligations
Week 10	using Active and Passive Voice for all tenses
Week 11	writing essay for important topics
Week 12	speaking about the general and academic topics
Week 13	using present perfect tense and how to make questions and negative sentences
Week 14	Talking in groups on different topics
Week 15	Listening to some video clips to improve knowledge of correct pronunciation
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New headway –English course by John and Liz Soars	Yes
Recommended Texts		
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

<table>
<tr><td colspan="4" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td>Computer Programming</td><td colspan="2">Module Delivery</td></tr>
<tr><td>Module Type</td><td>Basic</td><td colspan="2" rowspan="4">☒ Theory
☐ Lecture
☒ Lab
☐ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td>ATUU213</td></tr>
<tr><td>ECTS Credits</td><td>3</td></tr>
<tr><td>SWL (hr/sem)</td><td>100</td></tr>
<tr><td>Module Level</td><td>UG I</td><td>Semester of Delivery</td><td>2</td></tr>
<tr><td>Administering Department</td><td>MET</td><td>College</td><td>TCM</td></tr>
<tr><td>Module Leader</td><td>Shaymaa AbdulKhader Hamzah</td><td>e-mail</td><td>shaimaaal-jumaili@atu.edu.iq</td></tr>
<tr><td>Module Leader's Acad. Title</td><td>Lecturer</td><td>Module Leader's Qualification</td><td>M.sc</td></tr>
<tr><td>Module Tutor</td><td>none</td><td>e-mail</td><td></td></tr>
<tr><td>Peer Reviewer Name</td><td>none</td><td>e-mail</td><td></td></tr>
<tr><td>Scientific Committee Approval Date</td><td>01/06/2023</td><td>Version Number</td><td>1.0</td></tr>
</table>

<table>
<tr><td colspan="4" align="center">Relation with other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
</table>

<table>
<tr><td colspan="2" align="center">**Module Aims, Learning Outcomes and Indicative Contents**
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</td></tr>
<tr>
<td>**Module Objectives**
أهداف المادة الدراسية</td>
<td>1. To develop problem solving skills and understanding of computer programs.
2. To understand functions of engineering programs.
3. This course deals with the basic concept of derivation of functions programs.
4. This is the basic subject for all method of integration methods.</td>
</tr>
<tr>
<td>**Module Learning Outcomes**

مخرجات التعلم للمادة الدراسية</td>
<td>1. Recognize different types of functions and their behavior in science topics.
2. List the various lows associated with limits of computer.
3. Summarize what is meant by a basic computer.
4. Discuss the domain and range of many types of functions.
5. Describe computer components.</td>
</tr>
<tr>
<td>**Indicative Contents**
المحتويات الإرشادية</td>
<td>Indicative content includes the following.
<u>None</u></td>
</tr>
</table>

<table>
<tr><td colspan="2" align="center">**Learning and Teaching Strategies**
استراتيجيات التعلم والتعليم</td></tr>
<tr>
<td>**Strategies**</td>
<td>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.</td>
</tr>
</table>

<table>
<tr><td colspan="4" align="center">**Student Workload (SWL)**
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا</td></tr>
<tr>
<td>**Structured SWL (h/sem)**
الحمل الدراسي المنتظم للطالب خلال الفصل</td>
<td>48</td>
<td>**Structured SWL (h/w)**
الحمل الدراسي المنتظم للطالب أسبوعيا</td>
<td>3</td>
</tr>
<tr>
<td>**Unstructured SWL (h/sem)**
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td>
<td>52</td>
<td>**Unstructured SWL (h/w)**
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td>
<td>4</td>
</tr>
<tr>
<td>**Total SWL (h/sem)**
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<td colspan="3" align="center">**100**</td>
</tr>
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Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (10)	3,5,10 and 12	LO #1, #2 and #10, #11
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	Projects / Lab.	0	10% (10)	-----	----
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
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Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
Week	Material Covered
1+2	Definition of computers components and generations
3	MS-Doc Operating System
4+5	internal operating system commands
6	External operating system commands
7	The concept of Windows and its advantages
8	Take advantage of some keys to enter and close programs
9	Learn about desktop components
10	Take advantage of the control panel
11	Take advantage of additional programs
12+13	Note pad , WordPad handling
14+15	The concept of computer viruses
16	Preparatory week before the final Exam

<table>
<tr><td colspan="3">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
</table>

	Text	Available in the Library?
Required Texts	اساسيات الحاسوب وتطبيقاتها تاليف أ.م.د. زياد محمد عبود أ.د.غسان حميد عبد المجيد	Yes
Recommended Texts	None	No
Websites	None	

<table>
<tr><td colspan="5">Grading Scheme
مخطط الدرجات</td></tr>
</table>

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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