Bologna Course Study Guide description form

University Name: Al-Furat Al-Awsat Technical University
the college : Polytechnic College Karbala
scientific department: Department of Mechanical Engineering Technology
Name of the academic or professional program: Mechanical techniques/production
Name of the final certificate: Technical Diploma + Bachelor's
School system: Bologna
Date the description was prepared: 1/2/2026
File filling date: 15 / 2 /2026

signature:
Head of Department Name:
Lec. Dr. Mohammad A. Naser
Date: 16 / 2 /2026

signature:
scientific Associate Name:
Assit. pro. Dr. Mohammed Fadhil Neamha Al-yassery
Date: 16/ 2 / 2026

Check the file before
Division of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department :

Signature: Assit. pro. Ali Neamah Hasan
Date: 22/ •2/2026

Signature:
Approval of the Dean
Prof. Dr. Fadil M. Dahir
27-2-2026

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Al-Furat Al-Awsat Technical University

Polytechnic collage - Karbala



(Program Catalogue)

2025-2026

First Cycle – Bachelor’s Degree in Mechanical Technical Engineering / Production

بكالوريوس هندسة التقنيات الميكانيكية / الانتاج

Table of Contents

1. **Mission & Vision Statement** بيان الرؤية و الرسالة
2. **Program Specification** مواصفات البرنامج
3. **Program Goals** أهداف البرنامج
4. **Student Learning Outcomes** مخرجات تعلم الطالب
5. **Academic Staff** الهيئة التدريسية
6. **Credits, Grading and GPA** الاعتمادات و الدرجات و المعدل التراكمي
7. **Modules** المواد الدراسية
8. **Contact** اتصال

1. Mission & Vision Statement

Vision Statement

To achieve leadership and excellence in preparing highly qualified Mechanical Engineering Technology graduates who are scientifically and practically competent, capable of competing locally and internationally, and contributing to sustainable development and industrial transformation in accordance with the Bologna Process and academic quality standards.

Mission statement

The Department of Mechanical Engineering Technology is committed to providing high-quality technical engineering education based on the Bologna Process, integrating theoretical knowledge with practical applications, fostering engineering thinking, innovation, and applied research, while adhering to professional ethics, serving the community, and meeting labor market needs.

2. Program Specification

Programe Code	BSC-Mech, Eng.	**ETCS**	240
Duration	4 Levels, 8 Semester	**Method of Attendance**	Full Time

Mechanical Engineering Techniques of Production

The Mechanical Engineering Techniques of Production is a comprehensive academic program that focuses on applying fundamental engineering principles to the fields of power generation and thermal systems. While the specific syllabus may differ between universities, core subjects such as thermodynamics, fluid mechanics, internal combustion engines, and power system design remain consistent.

Program Components

The curriculum is designed to provide a well-rounded educational experience through a variety of practical and theoretical activities, including:

Group Projects:

Students collaborate on applied projects to enhance their teamwork and problem-solving skills.

Practical Training and Workshops:

The program offers hands-on experience through dedicated labs and workshops, ensuring students gain practical proficiency.

Internships and Industrial Visits:

Students gain a deeper understanding of real-world applications by participating in internships and visiting power plants and other industrial facilities.

Capstone Projects:

In their final year, students form teams to complete a capstone project that offers innovative solutions to complex engineering challenges within the field of mechanical power.

3. Program Objectives

1. To prepare graduates with technical competencies and practical skills aligned with the Bologna Process and labor market requirements.
2. To implement modern curricula based on learning outcomes and the credit hour system.
3. To enhance practical learning and industrial training and strengthen the link between academia and industry.
4. To develop students' analytical thinking, problem-solving abilities, and teamwork skills.
5. To support applied research and innovation in various mechanical technology fields.
6. To keep pace with technological advancement and digital transformation in engineering education.

7. To promote professional ethics, social responsibility, and environmental sustainability.
8. To strengthen cooperation with industrial and research institutions locally and internationally.
9. To continuously develop academic staff capabilities in line with quality assurance and accreditation standards.
10. To improve the quality of the educational process through continuous assessment and feedback

4. Student Learning Outcomes (SLOs)

A. Knowledge

By the end of the program, graduates will be able to:

SLO1. Explain the fundamental principles of mechanical engineering technologies, including mechanics, thermodynamics, fluid mechanics, and heat transfer.
SLO2. Describe the properties and behavior of engineering materials under mechanical and thermal loads.
SLO3. Explain manufacturing processes, machining operations, and mechanical production techniques.
SLO4. Describe the principles of mechanical system design and machine elements.
SLO5. Explain basic concepts of control systems, automation, and modern mechanical technologies.
SLO6. Explain occupational safety, sustainability, and environmental considerations in mechanical systems.

B. Skills

By the end of the program, graduates will be able to:

SLO7. Apply mathematical and engineering principles to solve mechanical engineering problems.
SLO8. Use engineering software and tools (e.g., CAD, CAE) for modeling and analysis of mechanical systems.
SLO9. Conduct laboratory experiments, analyze data, and interpret technical results.
SLO10. Design, analyze, and improve mechanical components and systems to meet specified

requirements.

SLO11. Identify mechanical faults and propose practical engineering solutions.

SLO12. Apply modern technologies, digital tools, and basic automation techniques in mechanical applications.

C. Professional Competences and Responsibility

By the end of the program, graduates will be able to:

SLO13. Work effectively as a member of multidisciplinary engineering teams.

SLO14. Communicate technical information clearly in written and oral forms.

SLO15. Demonstrate ethical responsibility, professional conduct, and commitment to safety standards.

SLO16. Manage time, tasks, and resources efficiently in engineering projects.

SLO17. Engage in lifelong learning and continuous professional development.

SLO18. Evaluate the economic, environmental, and societal impact of mechanical engineering solutions in line with sustainability principles.

5. Academic Staff:

Name: Mohammed Abdul kadhim Naser | Ph.D. in Mechanical Engineering | Lec.

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6. Credits, Grading and GPA

Credits:

- Al-Furat Al-Awsat Technology University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

- Grading Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows

Grading:

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRANDING SCHAME مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
Success Group (50-100)	A-Excellent	امتياز	90 - 100	Outstanding Performance
	B-Very Good	جيد جداً	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 with 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.				

The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

CGPA = [(1st module score x ECTS) + (2nd module score x ECTS) + ……] / 240

7. Curriculum / Module

Semester 1/ 30 ECTS / 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MTE111-22-PM	Engineering Mechanics (I) Statics	93	57	6	C	Non
MTE112-22-PM	Mathematics (I)	93	57	6	B	Non
MTE113-22-PM	Engineering Drawing	93	57	6	B	Non
MTE114-22-PM	Workshops (I)	93	57	6	C	Non
MTE115-22-PM	Engineering Material	63	37	4	S	Non
ATU10	English Language	33	17	2	S	Non

Semester 2/ 30ECTS / 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MTE121-22-PM	Engineering Mechanics (II)Dynamics	93	57	6	C	Non
MTE122-22-PM	Mathematics (II)	93	57	6	B	Non
ATU13	Human Rights and Democracy	33	17	2	S	Non
MTE123-22-PM	Fundamental of Electricity	63	37	4	B	Non
MTE124-22-PM	Manufacturing Processes (I)	93	57	6	C	Non
ATU12	Computer (I)	63	37	4	S	Non
ATU11	Arabic Language (I)	33	17	2	S	Non

Semester3/ 30 ECTS /1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MTE211-22-PM	Strength of Materials (I)	93	57	6	C	Non
MTE212-22-PM	Fundamental of Thermodynamics	63	37	4	C	Non
MTE213-22-PM	Manufacturing Processes (II)	93	57	6	C	Non
MTE214-22-PM	Workshops (II)	93	57	6	C	Non
MTE215-22-PM	Occupational Safety	48	52	4	B	Non
ATU 20	English Language (II)	33	17	2	S	Non
ATU22	Computer (II)	63	37	4	S	Non

Semester 4/ 30ECTS / 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MTE221-22-PM	Strength of Materials (II)	78	72	6	C	Non
MTE222-22-PM	Fluid Mechanics	63	37	4	B	Non
MTE223-22-PM	Mechanical Engineering Drawing	93	57	6	C	Non
MTE224-22-PM	Project (I)	63	37	4	C	Non
ATU 24	Crimes of the Baath Regime in Iraq	33	17	2	S	Non
MTE225-22-PM	Principle of Engineering Metallurgy	78	72	6	C	Non

ATU 21	Arabic Language(II)	33	17	2	S	Non

Semester 5/ 30ECTS / 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MTE311-22-PM	Theory of Machines	93	57	6.	C	Non
MTE312-22-PM	Mathematics (III)	63	87	6.	B	Non
MTE313-22-PM	Technology of materials	63	87	6.	C	Non
MTE314-22-PM	Professional Ethics	33	17	2.	S	Non
MTE315-22-PM	Principles of Production Engineering	78	47	5.	C	Non
MTE316-22-PM	Computer Applications (I)	48	27	3.	B	Non
MTE317-22-PM	English for Academic	33	17	2.	S	Non

Semester 6/ 30ECTS / 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MTE321-22-PM	Workshops (III) - CNC	93	57	6	C	Non
MTE322-22-PM	Hydraulic and Turbomachinery systems	63	62	5	B	Non
MTE323-22-PM	Numerical and Engineering Analyses	63	62	5	B	Non
MTE324-22-PM	Engineering Materials Inspections	78	72	6	C	Non
MTE325-22-PM	Heat Transfer	63	87	6	B	Non
MTE326-22-PM	Research Methodology Scientific	33	17	2	S	Non

Semester 7/ 30ECTS / 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MTE411-22-PM	Mechanical Design	78	72	6	C	Non
MTE412-22-PM	Control and Measurement Systems	63	62	5	C	Non
MTE413-22-PM	Engineering Nano materials and Technologies	63	62	5	B	Non
MTE414-22-PM	Industrial Engineering	63	62	5	C	Non
MTE415-22-PM	Systems Modeling and Simulation	78	47	5	C	Non
MTE416-22-PM	Graduation Project	63	37	4	C	Non

Semester 8 / 30ECTS / 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MTE421-22-PM	Vibration Theory	78	47	5	C	Non
MTE422-22-PM	Maintenance	48	77	5	B	Non
MTE423-22-PM	Computer Applications (II)	48	27	3	S	Non
MTE424-22-PM	Composite materials	48	52	4	C	Non
MTE425-22-PM	Computer Aided Design	78	47	5	B	Non

MTE426-22-PM	Graduation Project(continue)	63	37	4	C	Non

8. Contact

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mechanics/ Dynamics**			**Module Delivery**	
Module Type	**C**			☒**Theory** ☒ **Lecture** ☒ **Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**MTE121-22-PM**				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MTEK		**College**	ATU22	
Module Leader	Hussein Mohammed Sadeq		**e-mail**	hussein.sadeq@atu.edu.iq	
Module Leader's Acad. Title	Assist. Lec.		**Module Leader's Qualification**	M.s.c	
Module Tutor	-----		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	1/10/2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematics (I), Engineering Mechanics/ Static	**Semester**	1st
Co-requisites module	-----	**Semester**	-----

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- To provide students with a clear understanding of the fundamental concepts, principles, and unit systems in engineering dynamics. 2- To develop the ability to analyze particle motion in different forms, including rectilinear, curvilinear, tangential–normal components, and projectile motion. 3- To equip students with knowledge of Newton's laws of motion and their applications to particles, including the effects of forces, mass, acceleration, and frictional forces. 4- To introduce the fundamentals of kinetics of rigid bodies, with emphasis on moment of inertia and dynamic behavior. 5- To apply the principles of work and energy for analyzing particle and rigid body motion, including kinetic and potential energy. 6- To develop problem-solving skills using the principles of impulse and momentum, conservation laws, and their application to impact and collision problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**By the end of this module, students will be able to:** 1- Demonstrate understanding of the fundamental concepts and principles of engineering mechanics and dynamics. 2- Perform accurate unit conversions and apply scalar and vector quantities in problem-solving. 3- Analyze particle motion in rectilinear and curvilinear paths. 4- Calculate position, velocity, and acceleration using kinematic equations. 5- Apply tangential and normal components to describe motion. 6- Solve problems related to projectile motion. 7- Apply Newton's laws of motion to determine the relationship between force, mass, and acceleration. 8- Solve dynamic problems involving the application of Newton's laws to particles. 9- Evaluate the effects of frictional forces and apply them to real-

	world kinetic problems. 10- Apply kinetics principles to analyze the motion of rigid bodies under various loading conditions. 11- Calculate the work done by forces acting on particles and rigid bodies and use the principle of work and energy to analyze dynamic 12 - Calculate linear momentum and impulse, and apply the conservation of linear momentum. solve problems involving impact and collision.
Indicative Contents المحتويات الإرشادية	1- **Introduction to Engineering Mechanics/Dynamics** • Overview of engineering mechanics and its applications in mechanical systems. • Fundamental concepts and principles of dynamics. • Systems of units and unit conversions. 2- **Kinematics of Particles** • Position, velocity, and acceleration of particles. • Rectilinear motion: equations of motion and graphical representation. • Curvilinear motion: path, velocity, and acceleration components. • Tangential and normal components of acceleration. • Projectile motion and applications. 3- **Kinetics of Particles** • Newton's laws of motion, force–mass–acceleration relationship. • Application of Newton's laws to particle motion. • Frictional forces and their role in dynamic systems. • Applications of particle kinetics to real-world engineering problems. 4- **Kinetics of Rigid Bodies** • Concept and calculation of the moment of inertia. • Applications of kinetics to rigid body motion. 5- **Work and Energy** • Work done by forces acting on particles and rigid bodies. • Kinetic and potential energy concepts. • Principle of work and energy applied to dynamic systems. 6- **Impulse and Momentum** • Linear momentum and impulse. • Conservation of linear momentum.

	• Impulse-momentum principle and applications. • Impact and collision analysis in dynamic systems.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The primary strategy for delivering this module focuses on actively engaging students in exercises while simultaneously developing and enhancing their critical thinking skills. This will be accomplished through lectures, interactive tutorials, and simple experimental activities, including sampling exercises designed to capture students' interest and promote hands-on learning.

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	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
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	**Quizzes**	2	10%(100)	5,12	LO # 2-11

assessment	**Assignments**	2	10%(100)	2,11	LO # 3,6, 8 and 9
	Projects / Lab.	5	10%(100)	Continuous	
	Report	1	10%(100)	13	LO# 2- 11
Summative assessment	**Midterm Exam**	2hr	10%(100)	7	LO # 1-7
	Final Exam	2hr	50%(100)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Engineering Mechanics/Dynamics a- Overview of Engineering Mechanics/Dynamics b- Fundamental concepts and principles c- Unit conversions
Week 2	Kinematics of Particles / Position, velocity, and acceleration
Week 3	Rectilinear motion
Week 4	Curvilinear motion
Week 5	Tangential and normal components of acceleration
Week 6	Projectile motion
Week 7	Kinetics of Particles
Week 8	Newton's laws of motion, Force, mass, and acceleration
Week 9	Application of Newton's laws to particles
Week 10	Frictional forces / Applications of particle kinetics

Week 11	Kinetics of Rigid Bodies/ Moment of inertia
Week 12	Work and Energy / Work done by a force
Week 13	Kinetic energy and potential energy/ Principle of work and energy
Week 14	Impulse and Momentum/ Linear momentum and impulse/Conservation of linear momentum
Week 15	Impulse-momentum principle /Impact and collision/Applications of momentum
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	conversion units of scalar, Fundamental concepts and principles and Problem solving
Week 2	Angular motion (convert angular motion to linear motion)
Week 3	Free fall body App.
Week 4	Frictional forces Application
Week 5	Moment of inertia
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Engineering Mechanics/ Statics and Dynamics	yes

	Twelfth Edition R. C. Hibbeler, Dynamics - new issues in linear motion / Nashed Muhammad Ahmed and Schaum summaries	
Recommended Texts	Theory and Problems of Engineering Mechanics Statics and Dynamics/ Fifth Edition, Shaum's Outline, Static Hibler Engineering Mechanics Engineering Mechanics Miriam Hepler materials Nelson engineering mechanics	no
Websites	https://www.youtube.com/watch?v=XbCdh7h-Nx0 https://www.youtube.com/watch?v=gZF2wdhj https://www.youtube.com/watch?v=Ug818THEVE0 https://www.youtube.com/watch?v=XkQM3z3	

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	Manufacturing Processes (I)			**Module Delivery**	
Module Type	C			☒Theory ☒Lecture ☒ Lab ☐Tutorial ☐Practical ☐Seminar	
Module Code	MTE124-22-PM				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MTEK		**College**	ATU22	
Module Leader	Zainab abdulraheem abdulhasan nasar		**e-mail**	Zainab_abdulraheem@atu.edu.iq	
Module Leader's Acad. Title	Teacher		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-----		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module	-----	**Semester**	-----

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To introduce students to basic measurement techniques and metrology, enabling them to measure dimensions accurately using tools like calipers, micrometers, and gage blocks. 2. To develop students' ability to use angle measuring instruments and comparators (mechanical, optical, and manual) for precision inspection. 3. To provide knowledge of pattern making and allowances in casting, including types of patterns and their applications. 4. Teach students methods for designing and manufacturing wooden patterns according to technical specifications. 5. Enhance the ability to select appropriate materials and tools for wooden pattern making. 6. Raise awareness of occupational health and safety rules during carpentry and machine operations. 7. To familiarize students with casting processes and materials, including sand casting, permanent mold casting, die casting, and gravity casting, along with understanding casting advantages, disadvantages, and sand properties. 8. To train students in core manufacturing and design, including types of cores, core features, and core-making techniques relevant to casting. 9. To teach students metal melting, cleaning, and inspection procedures, emphasizing quality control and detection of casting defects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.Understand and use different measuring tools: Students will be able to use calipers, micrometers, and gage blocks accurately and understand various measurement methods. 2.Apply angle measurement and comparator techniques: Students will develop skills in measuring angles and using mechanical, optical, and manual comparators to detect dimensional deviations. 3.Understand pattern design and allowances: Students will identify types of patterns used in casting and understand the necessary allowances for accurate

	mold design. 4.Define the concept of carpentry, its types, and its importance in industrial and engineering applications. 5.Distinguish between different types of woodworking machines, their main components, and their functions. 6.Operate basic woodworking machines in accordance with occupational safety instructions. 7.Design and manufacture wooden patterns according to the required specifications for casting or manufacturing processes. 8.Comprehend casting processes and material properties: Students will describe different casting methods (sand casting, permanent mold casting, die casting, gravity casting), and explain their advantages, disadvantages, and relevant sand properties and tests. 9.Develop core manufacturing skills: Students will distinguish core types, understand core manufacturing processes, and relate core features to appropriate casting methods. 10.Understand melting, cleaning, and inspection of castings: Students will explain metal melting processes, casting cleaning and finishing procedures, and methods for detecting and inspecting casting defects
Indicative Contents المحتويات الإرشادية	• Introduction to the principles of engineering measurement and methods for measuring the dimensions of mechanical components. • Use of vernier calipers for measuring external dimensions, internal dimensions, and hole depths. • Introduction to micrometers and their use in precision measurements. • Study of standard gage blocks and their application in calibrating measuring instruments. • Introduction to angle measuring instruments and gages used for inspecting geometric accuracy. • Study of mechanical, optical, and manual comparators for dimensional comparison and measurement verification. • Introduction to woodworking processes and machines used in pattern making. • Study of casting pattern types and the allowances required for their manufacture.

	• Introduction to the casting process, its advantages, disadvantages, and industrial applications. • Study of metal mold casting, centrifugal casting, and their various types. • Introduction to sand casting, the properties of molding sands, and methods of sand testing. • Study of cores, core types, core manufacturing methods, and their functions in castings. • Introduction to the tools and techniques used in preparing sand molds and producing simple and complex patterns. • Study of metal melting furnaces and their operating principles. • Introduction to casting cleaning operations and post-production inspection methods. • Study of common casting defects, detection techniques, and casting quality evaluation methods.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Strategies 1. Guided theoretical learning: o Deliver lectures to explain fundamental concepts such as mechanical measurements, metrology, pattern types in casting, material properties o Use visual aids, videos, and illustrations to simplify complex processes. 2. Practical and applied learning o Conduct practical experiments for dimension measurement using calipers, micrometers, and gage blocks. o Apply angle measurement techniques and comparators in workshops. o Perform sand casting experiments and core preparation, observing the effect of allowances on casting quality. o Practice cleaning and inspecting castings to identify and correct

	defects. 3. Learning by research and problem solving o Assign students real-life casting or welding cases to analyze defects or process improvements. o Prepare short reports documenting measurement, casting, or Woodworking steps and analyzing results. 4. Collaborative Learning: o Work in groups to perform practical experiments or design a casting pattern. o Share experiences and discuss results among peers to enhance applied understanding. 5. Continuous Assessment: o Conduct short tests on theoretical concepts. o Evaluate practical performance in the lab or workshop. o Provide ongoing feedback to correct errors and improve measurement, and casting skills.

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	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
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%(100)	8,9,10,11	LO # 5, 6 and 7
	Assignments	2	10%(100)	2,3,4,5,6	LO # 1, 2, 3 and 4
	Projects / Lab.	5	10%(100)		
	Report	1	10%(100)	13	
Summative assessment	Midterm Exam	2 hr	10%(100)	1-6	
	Final Exam	3hr	50%(100)	1-15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Measurements and Metrology (Measurement and methods of measuring dimensions)
Week 2	calipers
Week 3	Micrometer, Measurement molds)Gage Blocks(
Week 4	Angle Measuring Instruments, Gages
Week 5	Mechanical, optical, and manual comparators
Week 6	Woodworking, Woodworking Machines, Patternmaking
Week 7	Patterns, Types of Patterns Used in Casting, Pattern Allowances
Week 8	Casting, Advantages of Casting ,Disadvantages of Casting

Week 9	Metal mold casting and its types, Centrifugal casting and its types
Week 10	Sand Casting, Properties of casting Sands , Sand Properties Test
Week 11	core, core types ,core manufacturing, core features
Week 12	The tools and techniques used in preparing sand molds - making a simple and complex model
Week 13	Melting furnaces
Week 14	Cleaning and inspection of castings
Week 15	Casting defects and casting inspection
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Identification of different measuring tools – Performing measurements using various types of calipers.
Week 2	Performing measurements with different types of micrometer
Week 3	Gage Blocks and sin bar
Week 4	Use of comparators (mechanical, optical, electronic)
Week 5	Measurement of angles and lateral shapes (universal bevel protractor) and identifying different measurement parameters and dimensions.
Week 6	Calculation of the fineness number of casting sand
Week 7	Calculation of the permeability of casting sand
Week 8	Performing mechanical tests on casting sand sample
Week 9	Determination of the clay content and moisture in casting sand

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Springer Handbook of Mechanical Engineering, Grote, Antonsson (Eds.), Professor Dr.-Ing. Karl-Heinrich Grote, Professor Erik K. Antonsson,2008 2- METAL CASTING, Reference Book for MY4130), By Prof. Karl B. Rundman 3- Complete Casting Handbook, John Campbell, Emeritus Professor of Casting Technology, University of Birmingham, UK,2011	
Recommended Texts	1. MATERIALS AND PROCESSES IN MANUFACTURING, TENTH EDITION, J T. Black Auburn University-Emeritus Ronald A. Kohser University of Missouri–Rolla,2008 2. Machining Fundamentals :From Basic to Advanced Techniques, John R.Walker,2000	
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	**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

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics (II)**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MTE122-22-PM**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MTEK		**College**	ATU22	
Module Leader	Mohammed Abdul Kadhim Naser		**e-mail**	muhamad.alrakkabi@atu.edu.iq	
Module Leader's Acad. Title	teacher		**Module Leader's Qualification**	Ph.D	
Module Tutor	None		**e-mail**		
Peer Reviewer Name	None		**e-mail**		
Scientific Committee Approval Date	01/10/2025		**Version Number**	1	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى		
Prerequisite module	Mathematics (I)	**Semester**
Co-requisites module	Mathematics (III)	**Semester**

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To introduce the student to the basic and advanced principles of calculus and integrations and its various applications 2. To develop his mental abilities when solving exercises. 3. Linking data with information to reach a solution to issues and benefit from them in other subjects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize differential and integration. 2. Discuss Integration methods 3. Discuss Integration by parts, partial fraction. 4. Explain the Retail integration. 5. Identify the Integration by completing the square. 6. Summarize what is meant by a scalar and vector product and projections. 7. Identify Complex numbers. 8. Discuss partial derivative 9. Discuss Double and triple integral 10. Identify Polar coordinates, cylindrical and spherical coordinates. 11. Discuss the Series, power, Taylor/Maclaurin series.
Indicative Contents المحتويات الإرشادية	

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 that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
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	15% (100)	5 and 10	LO #1, #2 and #10, #11
	Assignments	4	15% (100)	2 ,5,9, 12	LO #3, #4 , --, #11
	Projects / Lab.	0	0%		
	Report	1	10% (100)	13	LO #5, #8,#9 and #10
Summative assessment	Midterm Exam	2hr	10% (100)	7	LO #1 - #7
	Final Exam	3hr	50% (100)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبو عي النظري

	Material Covered
Week 1	Review in differential and integration
Week 2	Integration methods; Integration by parts
Week 3	Integration by partial fraction
Week 4	Integration by division of fractions
Week 5	Integration by completing the square
Week 6	Integration by trigonometric function method
Week 7	Vectors: vectors components and the unit vectors, equation of straight line and an equation for a plane in space plane, tangent and perpendicular line ,vector function.
Week 8	scalar and product vector and projections, mechanical applications to vectors
Week 9	Complex numbers , polar form ,Euler equation , exponential and roots of complex numbers, composite function, function, Cauchy-Riemann equation
Week 10	partial derivative , gradient and directional derivative, maximum and minimum values for tow variable functions
Week 11	Double integral, areas and volumes -physical applications
Week 12	Triple integral
Week 13	Polar coordinates , cylindrical and spherical coordinates , curve drawing in polar coordinates

Week 14	The Series: sequences of numbers - limits - infinite series -limit by definition - alternating series test - power series - converges interval
Week 15	Taylor/Maclaurin series for a function - general applications
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Calculus, R. Mohammed and A. Abdulaali, 2002	
Recommended Texts	Advanced calculus, Murray R. Splegel, 1962	
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	**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

Module Information				
Name	**Human rights and democracy**		**Module Delivery**	
Type	Sub		☒ Theoretical ☒ Lecture ☒ Tutoring ☐ Practical ☐ Seminar	
Unit symbol	**ATU13**			
ECTS	**2.00**			
SWL (hour/half)	**50**			
Module Level	**1**	**Semester of Delivery**	**2**	
Administering Department	**Business Administration Technology Department**	**College**	Polytechnic College - Karbala	
Module Leader	**Mohammedhamid kadhim**	**e-mail**		
Module Leader's Acad. Title	**mudaris musaeid**	**Leader unit qualifications**	**MS**	
Module Tutor	**Mohammedhamid Kadhim**	**e-mail**	**Mohammed.kadhim.ikr@atu.edu.iq**	
Peer Reviewer Name		**e-mail**	**Mohammed.kadhim.ikr@atu.edu.iq**	
Date of approval by the Scientific Committee		**issue number**		

Relation with other Modules			
Basic requirements unit	**nothing**	**There is no classroom**	
Common requirements unit	**nothing**	**There is no classroom**	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	**First: Cognitive Objectives** 1. 1- To understand the concepts of human rights and democracy and their manifestations in ancient civilizations and monotheistic religions. 2- To examine how the Islamic faith addresses religious and secular human rights, demonstrating that Islam grants individuals numerous and significant rights both before and after birth. 3. To become familiar with the types of human rights, democratic principles, and guarantees enshrined in the 2005 Constitution of the Republic of Iraq. 4. To understand and study the provisions of international agreements, most importantly the Universal Declaration of Human Rights and the French Declaration of the Rights of Man and of the Citizen of 1789. 5. To be able to broaden their understanding of the concept of national guarantees for human rights, particularly general and specific constitutional guarantees. 6. To clarify the concept of democracy and its characteristics, understand the types of political systems that guarantee human rights and political freedoms, and attempt to apply them in practice. **Second: Skill-Based Objectives** 1.
Module Learning Outcomes	1. To understand the nature of public rights and freedoms and their historical roots. 2. To identify the types of human rights stipulated in the current Iraqi Constitution. 3. To understand the guarantees of human rights. 4. It identifies the skills specific to the subject and the essential elements that comprise this material. 5. It distinguishes between theory and practice in the field of human rights and democratic principles. 6. It is based on a study of the human rights situation in Iraq.
Indicative Contents	The guidance content includes the following: Part A: Human Rights Introduction to Human Rights and Democracy (SSWL=15) The right to equality before the law, public office, duties, and responsibilities. (SSWL=10) Legal means of protecting human rights, the principle of separation of powers, constitutional protection. (SSWL=15).

	Part B: Defining the Necessity of Democracy and the Protection of Human Rights and Freedoms Protection from Poverty, Disease, Old Age, and Disability. (SSWL=10) Principles of Democracy and Systems of Governance. (SSWL=15) Fundamental Guarantees for the Success of Public Freedoms, the Rule of Law, Public Opinion, and Others. (SSWL=10) (Timetable: Hours x 15 Weeks)

Learning and Teaching Strategies

Strategies	1. The scientific lecture method. 2. The discussion method, which involves posing questions to students to help them learn scientific analysis. 3. Encouraging students to engage in dialogue and to ask questions and share innovative ideas and opinions. 4. Brainstorming. 5. Critical thinking strategies in learning

Student Workload (SWL)

Structured SWL (h/sem)	**33**	**Structured SWL (h/w)**	2
Unstructured SWL (h/sem)	**17**	**Unstructured SWL (h/w)**	1.5
Total SWL (h/sem)	**50**		

Module Evaluation

		Time/number	Weight ((marks	week	Relevant learning outcomes
Formative assessment	Quizzes	**2**	**10% (10)**	**5 and 10**	**LO #1, #2 and #10, #11**
	Assignments	**5**	**10% (10)**	**2,6**	**LO #3, #4 and #6, #7**
	Project Design	**2**	**10% (10)**	**6,10**	**LO#6**
	Report	**1**	**10% (10)**	**12**	**LO #5, #8 and #10**
Summative assessment	Midterm Exam	**2hr**	**10% (5+5)**	**4,7**	**LO #1 - #7**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**

Overall evaluation	**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	The concept of human rights, international law, and national and procedural mechanisms for their implementation
Week 2	Specific and individual rights and national and procedural mechanisms for their implementation
Week 3	Combating gross human rights violations (agreements and mechanisms)
Week 4	Grave human rights violations in Iraq before and after 2003
Week 5	The Human Rights Council and the Universal Periodic Review Mechanism
Week 6	International, regional, and national mechanisms for the protection of human rights and accountability mechanisms
Week 7	Challenges facing human rights (legal and political challenges – contemporary issues)
	National and procedural mechanisms for promoting human rights
Week 8	An Introduction to Democracy (Historical Origins – Developments in the Democratic Process – Institutional, Societal, and Political Components of Democracy)
Week 9	Models of Democracy – Systems of Governance in Islam and Democracy
Week 10	Separation of Powers – Checks and Balances – Principles of Democratic Governance
Week 11	Mechanisms of Democracy (Elections – Their Systems and Conditions)
Week 12	Political Parties (Their Systems – Types)
	Civil Society and Pressure Groups (The Concept – The Difference Between Them – Their Roles)
Week 13	The relationship between democracy and public freedoms (Guarantees for regulating rights and freedoms in a democratic system)
	The reciprocal relationship between media and democracy (The role of media in spreading political awareness - Media disinformation - The influence of media on shaping public opinion (Digital media)
Week 14	Democratic Systems – Digital Democracy (Concept – Tools for Electronic Participation)
Week 15	The Democratic Experience in Iraq after 2003

Learning and Teaching Resources		
	Text	**Available in the library?**
1	**The ministerial curriculum prescribed according to the Ministry's book No. (T M 3/13387) dated (29/10/2025)**	**yas**

Grading Scheme				
Group	**Grade**	Estimate	**Marks %**	**Definition**
Success Group (١٠٠ - ٥٠)	A - Excellent	Excellent	**90 - 100**	Outstanding performance
	B - Very Good	Very Good	**80 - 89**	Above average with some errors
	C - Good	Good	**70 - 79**	Sound work with noticeable errors
	D -Satisfactory	Average	**60 - 69**	Fair but with significant flaws
	E - Adequate	Acceptable	**50 - 59**	Work meets minimum standards
Failed group (49 – 0)	FX - Failure	Fail (Under review)	**(45-49)**	More work required but credit given
	F - Failure	Fail	**(0-44)**	Large amount of work required

Note: Decimal marks that are more or less than 0.5 will be rounded up or down to the nearest whole mark (for example, a mark of 54.5 will be rounded up to 55, while a mark of 54.4 will be rounded up to 54). The university has a zero-tolerance policy for "near-pass failures" and therefore the only adjustment to marks awarded by the original mark(s) will be the automatic rounding described above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Fundamentals of Electricity**			**Module Delivery**	
Module Type	**Basic learning activities**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MTE123-22-PM**				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MTEK		**College**	ATU22	
Module Leader	Zahraa Saad Hamzah		**e-mail**	Zahraa.hamzah.ikr@atu.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**	Ph.D.	
Module Tutor	-----		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**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 circuit theory through the application of techniques. 2. To understand voltage, current, and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Law problems. 6. To perform Thevenin's Norton's Theorem.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of DC circuits in an electric circuit. 9. Discuss the various properties of resistors. 10. Explain the two Kirchhoff's laws used in circuit analysis. 11. Identify the basic circuit elements, Maximum Power Transfer Theorem and Reciprocity Theorem 12. Describe Thevenin's theorem and Norton's theorem and how they work
Indicative Contents المحتويات الإرشادية	1- Definition: Symbols and Abbreviations, Units, Electric Circuit & Its Element. The Direct Current Network. , Ohms low, Charge, Force, Work, Power. (20 hr) 2- -Circuit Theory: DC circuits – Current and voltage definitions, Passive sign convention, and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's laws. Anatomy of a circuit, Network reduction (20 hr) 3-Revision problem classes:

	4- Resistive networks, voltage, and current sources, Thevenin and Norton equivalent circuits, Conversion Delta To Star Connection, Superposition Method, Maximum Power Transfer Theorem, Reciprocity Theorem (20 hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Strategies used in this module: 1. Lectures: Lectures are a primary teaching method in this module, where instructors deliver theoretical concepts, principles, and explanations. Lectures can include visual aids such as slides, diagrams, and animations to facilitate understanding. Instructors may also provide real-life examples and applications to make the content more relatable. 2. Practical Examples and Problem-Solving: Instructors can use practical examples and problem-solving exercises to help students apply theoretical concepts to real-world situations. By presenting and solving problems related to electrical circuits, students can develop critical thinking and analytical skills. 3. Laboratory Work: Laboratory sessions provide hands-on experience and reinforce theoretical concepts. Students can perform experiments and measurements using electrical components and instruments. This allows them to apply theoretical knowledge, gain practical skills, and understand the behavior of electrical systems in a controlled environment. 4. Group Discussions and Collaborative Learning: Group discussions and collaborative learning activities encourage students to engage actively in the learning process. Students can work together to solve problems, analyze case studies, or discuss challenging concepts. This promotes peer learning, critical thinking, and communication skills. 5. Tutorials and Workshops: Tutorials and workshops offer opportunities for students to seek additional help and clarification on specific topics. Instructors or teaching assistants can provide individual or small-group assistance, address students' questions, and guide them through problem solving exercises. 6. Multimedia and Interactive Tools: Multimedia resources, such as videos, animations, and interactive simulations, can be used to enhance understanding and engage students. These resources can provide visual representations of abstract concepts and allow students to interact with the content, fostering active learning. 7. Guest Lectures and Industry Visits: Inviting guest speakers from industry or conducting visits to electrical engineering-related facilities can provide students with real-world perspectives and insights. Professionals can share their

	experiences, current trends, and practical applications, giving students a broader understanding of the field.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
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	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.13
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% (100)	5 and 10	LO # 1,2 and 10, 11
	Assignments	2	10% (100)	2 and 12	LO #3, 4 and 6, 7
	Projects / Lab.	8	10% (100)	continuous	LO #1, 2,3,4,5 and #6
	Report	2	10% (100)	6.13	LO #5, 8 and #10, 11, 12
Summative assessment	**Midterm Exam**	2hr	10% (100)	7	LO #1 - #7
	Final Exam	3hr	50% (100)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Symbols and abbreviations
Week 2	The direct current networks, Ohm law
Week 3	Series Circuits (Resistance in Series) Voltage Divider Rule
Week 4	Series Circuits (Resistance in Series) Voltage Divider Rule
Week 5	Parallel Circuits (Resistances in Parallel) Current Divider Rule.
Week 6	Open and Short Circuits, Source Transformation
Week 7	Series-Parallel Circuits Transformation
Week 8	Kirchhoff's Laws: - Kirchhoff's current law (KCL) and. Their Use In Network Analysis.
Week 9	Kirchhoff's voltage law (KVL).
Week 10	Use of Kirchhoff's voltage law in Network Analysis
Week 11	Conversion Delta To Star Connection And Conversion Star To Delta Connection,
Week 12	Superposition Method
Week 13	Thevenin's Theorem, Norton's Theorem
Week 14	Maximum Power Transfer Theorem
Week 15	Reciprocity Theorem
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	How to use Ammeter, Voltmeter and Ohmmeter

Week 2	Apply Ohm's Law
Week 3	Apply Kirchhoff's law to measure current
Week 4	Apply Kirchhoff's law to measure voltage
Week 5	Superposition Method
Week 6	Norton's Theorem. Lab
Week 7	Thevenin's Theorem
Week 8	Delta To Star Connection And Conversion Star To Delta Connection

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	YES
Recommended Texts	1. DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents. 2. Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	NO
Websites	https://www.coursera.org/browse/physical-science-and engineering/electrica	

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

Module Information معلومات المادة الدراسية					
Module Title	**Arabic Language**			**Module Delivery**	
Module Type	**C**			☒**Theory** ☐**Lecture** ☐ **Lab** ☒**Tutorial** ☐**Seminar**	
Module Code	**ATU11**				
ECTS Credits	2				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	٢	
Administering Department	ATU١١		**College**	PMTE	
Module Leader	Ali Hamzah Abbas		**e-mail**	ali.abbas.ikr@atu.edu.iq	
Module Leader's Acad. Title	مدرس دكتور		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-----		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	26/2/2026		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module	-----	**Semester**	-----

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	**First: General Objectives** Distinguish between the tied Taa (Taa Marbuta) and the open Taa (Taa Maftuha). Provide examples of words ending with Taa Marbuta. Differentiate between the extended Alif (Alif Mamduda) and the shortened Alif (Alif Maqsura). Distinguish between the solar "L" (Al-Lam Al-Shamsiya) and the lunar "L" (Al-Lam Al-Qamariya). Differentiate between the letters Ḍād (ض) and Ẓā' (ظ) in writing. Define Hamzat al-Qat‘ (قطع) and give examples. Define Hamzat al-Waṣl (وصل) and identify its positions. Recognize the rules for writing the medial hamza. Recognize the rules for writing the final hamza. Explain why the medial hamza is written on Alif in certain cases. Use punctuation marks correctly. Distinguish between noun, verb, and particle. Explain the types of the absolute object (maf‘ūl muṭlaq) and define the direct object (maf‘ūl bihi). Identify the types of numbers. Recognize the importance of administrative writing language. Understand the meanings and uses of prepositions. Identify the positions where the distinguishing Alif (Alif Fāriqa) is written. Distinguish between nūn and tanwīn. Demonstrate how to write administrative formats correctly.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	9. Teaching and learning strategies
Indicative Contents	Present real financial problems for students to solve and analyze. Prepare an applied project such as investment evaluation or preparing a loan

المحتويات الإرشادية	repayment schedule. Analyze real cases from banks or investment companies. Use Excel or a financial calculator in calculations and analysis.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Present real financial problems for students to solve and analyze. Prepare an applied project such as investment evaluation or preparing a loan repayment schedule. Analyze real cases from banks or investment companies. Use Excel or a financial calculator in calculations and analysis.

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	1.5
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	3	20%	4,8,12	LO#1,#2,#3
	Assignments	2	10%	6,10	LO#,#4
	Projects / Lab.	…….			
	Report	١	10%	13	
Summative assessment	Midterm Exam	1hr	10%	7	LO#1.#4
	Final Exam	2hr	50%	16	All Los
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Common linguistic errors: Taa Marbuta and Taa Maftuha
Week 2	Extended Alif (Alif Mamduda), Shortened Alif (Alif Maqsura), and Solar and Lunar letters
Week 3	The letters Ḍād (ض) and Ẓā’ (ظ)
Week 4	Medial hamza and final hamza
Week 5	Punctuation marks
Week 6	Noun and verb and the difference between them
Week 7	Direct object, absolute object, object of purpose, object of place/time, and object of accompaniment
Week 8	Numbers
Week 9	Applications of common linguistic errors
Week 10	Meanings of prepositions, the rule of the distinguishing Alif (Alif Fariqa), and Nunation (Tanween)
Week 11	Formal aspects of administrative writing

Week 12	Language of administrative writing
Week 13	Common linguistic errors: Taa Marbuta and Taa Maftuha
Week 14	Extended Alif (Alif Mamduda), Shortened Alif (Alif Maqsura), and Solar and Lunar letters
Week 15	Extended Alif (Alif Mamduda), Shortened Alif (Alif Maqsura), and Solar and Lunar letters
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Applied Grammar: Khalid Abdul Aziz, Edition 2018–2019 Clear Dictation: Abdul Majeed Al-Nuaimi, Baghdad, 6th Edition, 1987 Arabic Language for Second Intermediate Grade: Fatima Nazem, Edition 2018 Inspired by Arabic Literature: Haval Mohammed, Al-Saadoon	

	Press, Baghdad	
Recommended Texts		
Websites	Specialized online platforms	

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 (I)**			**Module Delivery**	
Module Type	**C**			☒**Theory** ☐**Lecture** ☐ **Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**ATU12**				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	1		**Semester of Delivery**	٢	
Administering Department	ATU		**College**	PMTE	
Module Leader	SATTAR JABBAR		**e-mail**	Sattar.mettib@atu.edu.iq	
Module Leader's Acad. Title	Assist teacher		**Module Leader's Qualification**	Meng	
Module Tutor	-----		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module	-----	**Semester**	-----

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	١. Utilize the computer for fundamental tasks. ٢. Identify and discuss the hardware components of the computer system. ٣. Creating documents using a word processor and creating presentations. ٤. Researching on the internet. ٥. An introduction to AI (Artificial Intelligence).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١. Utilize the computer for fundamental tasks: - Students will be able to correctly start up and shut down the operating system. - Students will be able to handle files and folders, including creating, copying, moving, and deleting files. - Understand and manage operating system settings to ensure optimal performance. ٢. Identify and discuss the hardware components of the computer system: - Students will be able to explain the role and importance of the CPU, RAM, and Hard Drive. - Identify different types of peripheral devices such as printers, monitors, and input devices (mouse, keyboard). - Ability to identify internal computer components and how to upgrade or replace faulty components. ٣. Creating documents using a word processor and creating presentations: - Students will be able to use a word processor to create professional documents that include complex formatting, tables, charts, and graphs. - Create attractive presentations that include text, images, graphs, and videos. - Enhance presentations with animations, transitions, and effective presentation skills. ٤. Conducting research on the internet:

	- Students will be able to effectively use search engines to find the required information. - Evaluate the reliability of sources and information found on the internet. - Use electronic tools to organize and manage references and research sources. ٥. An introduction to AI (Artificial Intelligence): - Students will understand the basic principles of AI and how to apply them in real- world scenarios. - Understand machine learning and deep learning techniques. - Study applications of AI in fields like healthcare, industry, commerce, and gaming.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Weeks 1-10: Week 1-2: Utilizing the computer for fundamental tasks: - Starting up and shutting down the operating system. - Managing files and folders (creating, copying, moving, deleting). - Basic system and security settings. Week 3-5: Identifying and discussing computer hardware components - Explaining computer components (CPU, RAM, Hard Drive). - Studying internal computer components and assembling/disassembling components. - Exploring peripheral devices and their functions. Week 6-9: Creating documents using word processors and presentations - Creating professional documents in Microsoft Word (tables, charts). - Adding illustrations and images in documents. - Creating presentations in Microsoft PowerPoint. - Enhancing presentations with animations, transitions, and effective presentation skills. Week 10: Conducting research on the internet - Effectively using search engines to find information. Weeks 11-14: Week 11-12: Conducting research on the internet

	- Evaluating the credibility of online sources. - Organizing references using reference management tools. Week 13-14: Introduction to Artificial Intelligence (AI) - Basic principles of AI. - Studying machine learning and deep learning techniques. Week 15: Week 15: Applications of Artificial Intelligence - Practical applications of AI in various fields (healthcare, industry, commerce).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Educational and learning strategies: Proposed Educational and Learning Strategies for the Computer Science Course in the College of Engineering Technologies ١. Interactive and Technology-Enhanced Learning: - Workshops and Hands-on Labs: Provide practical experiences for students through direct work on hardware and software. This helps reinforce theoretical concepts. - Online Lessons: Offer additional educational content through videos and recorded lectures to facilitate access to information at any time. - Use of Educational Electronic Tools: Such as Learning Management Systems (LMS), electronic research tools, word processing, and presentation software. ٢. Collaborative and Participatory Learning: - Study Groups and Group Discussions: Divide students into small groups to work together on tasks and projects, and organize discussion sessions on specific topics that allow students to express their opinions and benefit from others' experiences.

	- Collaborative Projects: Encourage students to implement collaborative projects that allow them to apply what they have learned, such as creating presentations or writing complex documents. ٣. Project-Based and Practical Learning: - Long-term Projects: Related to artificial intelligence or internet research, enabling students to integrate and apply acquired knowledge over several weeks. - Presenting Results: Allocate time for presenting and discussing student projects, which enhances self-confidence and encourages improving presentation skills. ٤. Continuous Assessment and Critical Analysis: - Short Quizzes and Practical Evaluations: Provide short quizzes after each topic to assess students' understanding and ensure learning outcomes are achieved, and rely on projects and practical ٤ experiments as part of student assessment. - Critical Thinking and Self-Assessment: Encourage students to critically think and analyze information and sources, assess their performance, and identify strengths and weaknesses to improve their skills. ٥. Case-Based and Real-World Learning: - Analyzing Real-World Cases: Study practical cases in artificial intelligence and other mentioned fields, which helps in understanding the practical application of theoretical concepts. With this integrated approach, a comprehensive, engaging, and effective learning experience can be achieved that supports the achievement of learning outcomes in a well-rounded manner and meets the needs of 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	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.8
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%(100)	5 and 10	LO #1, #2 and #3, #4
	Assignments	2	10%(100)	2 and 12	LO #1, #2 and #3, #4
	Projects / Lab.	-----	10%(100)	continuous	ALL
	Report	1	10%(100)	13	LO #1, #2 and #3, #4
Summative assessment	**Midterm Exam**	2hr	10%(100)	7	LO #3, #4 and #5
	Final Exam	3hr	50% (100)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered

Week 1	Introduction to computer: Concepts of Hardware and Software with their components; Concept of Computing, Data and Information: Connecting input/output devices, and peripherals to CPU.
Week 2	Introduction to computer: Computer Portions, Hardware Parts, I/O Units, Memory Types.
Week 3	Computer components: Computer portions, hardware parts, I/O Units, Memory types, Basic CPU Components, computer ports, Personal Computers, Personal Computers (Features and Types)
Week 4	Operating System and Graphical User Interface GUI: Operating System, Basics of Common Operating Systems. The User Interface. Using Mouse Techniques.
Week 5	Operating System and Graphical User Interface GUI(Cont.): Use of Common Icons, Status Bar, Using Menu and Menu-selection, Concept of Folders and Directories, Opening and closing of different Windows; Creating Short cuts
Week 6	Word Processing: Word Processing Basics, Basic Features of Word Processors, Opening and Closing of documents, Text creation and Manipulation; Formatting Text and Paragraphs. Using Templates for Document Creation.
Week 7	Word Processing (Cont.): Creating and Managing Tables, Utilizing Styles and Themes, Spell Check and

	Grammar Tools, Using Headers and Footers
Week 8	Spread Sheet: Introduction to Spreadsheet Software, Creating and Formatting Worksheets. Sorting and Filtering Data, Using Formulas and Functions.
Week 9	Spread Sheet (Cont.): Using Formulas and Functions, Using Pivot Tables for Data Analysis, Data Validation and Error Checking, Data Visualization: Creating Charts and Graphs.
Week 10	Presentation Software: Introduction to Presentation Software, Overview of Popular Presentation Tools, creating a New Presentation, Using Templates and Themes, Inserting and Formatting Text and Images, Transition and Animation Effects
Week 11	Presentation Software (Cont.): Using Speaker Notes and Timers,, Advanced Features: Hyperlinks and Action Buttons, Troubleshooting Common Presentation Issues, Future Trends in Presentation Technology
Week 12	Introduction to Internet and Web Browsers: Computer networks Basic; LAN, WAN, Concept of Internet and its Applications; connecting to internet.
Week 13	Introduction to Internet and Web Browsers(Cont.): World Wide Web: Web Browsing software's, Search Engines; Understanding URL; Domain name; IP Address.
Week 14	Communications and Emails: Basics of electronic mail; Getting an email account; Sending and receiving

	emails; Accessing sent emails: Using Emails, Document collaboration.
Week 15	**Introduction to Cloud Computing and Services:** **Definition of Cloud Computing and its concept, Cloud-Based Office Suites (Office 365 and Google Workspace), Google Docs, Google Sheets, Google Drive, Google Meet.**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Computer Concepts of Hardware and Software. Data Information Applications of Information Electronics and Communication Technology (IECT);
Week 2	I/O devices; Peripherals to CPU. Definition and Introduction to the Hardware and Software Computer Components.
Week 3	Lab 2: Computer Components. Lab 3: Operating Systems and GUI
Week 4	Application of Operating Systems and GUI. Lab 4: Microsoft Word; and PowerPoint.
Week 5	Microsoft Word, PowerPoint and their applications Lab 5: Spread Sheets.
Week 6	Lab 6: Presentation Sheet. Lab 7: Introduction to Internet and WEB Browser.
Week 7	Communications and E-mails. Computer Troubleshooting.

	Discussion

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Graham Brown, David Watson. ''Cambridge IGCSE Information and Communication Technology'', 3rd Edition (2020). 2. Alan Evans, Kendall Martin, Mary Anne Poasty, ''Technology In Action Complete'', 16th Edition (2020) 3. Amed Banafa, ''Introduction to Artificial Intelligence (AI)'', 1st Edition (2024)	
Recommended Texts	١- الخضر علي الخضر باحث اساسيات الحاسوب ٢٠١٦ ٢- الدكتور عادل عبد النور (مدخل الى علم الذكاء الاصطناعي ٢٠٠٥)	
Websites		

Grading Scheme مخطط الدرجات				
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