University of Technology

الجامعة التكنولوجية

First Cycle – Bachelor's degree (B.Sc.) – Computer Aided Desing and Computer Aided Manufacturing Engineering

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Program Catalogue for CAD/CAM Undergraduate Students

1. Mission & Vision Statement

Vision Statement

The CAD/CAM academic staff of the Dept. of Production Engineering and Metallurgy believe that students gain a comprehensive understanding of computer-aided design and computer-aided manufacturing through a combination of theoretical coursework, practical laboratory experiences, research, and real-world applications. The program aims to equip students with the necessary knowledge and skills to become proficient CAD/CAM professionals. Small class sizes foster close interaction between faculty and students, creating an environment conducive to learning, innovation, and personal growth.

Mission Statement

The CAD/CAM program is committed to providing undergraduate students with a strong foundation in computer-aided design and computer-aided manufacturing. The curriculum is designed to impart fundamental knowledge in CAD/CAM principles, tools, and techniques while emphasizing hands-on experience and practical skills development. Our mission is to prepare graduates for successful careers in the CAD/CAM industry, research, or further academic pursuits. The program also strives to support interdisciplinary collaboration and contribute to technological advancements in various fields.

2. Program Specification

Programmed code:	BSc-CADCAM	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

The CAD/CAM program provides a comprehensive education that integrates design and manufacturing processes, encompassing the field's theoretical and practical aspects. The degree program offers a broad perspective, addressing topics ranging from foundational CAD/CAM principles to advanced techniques. Students have the opportunity to specialize further in specific areas of CAD/CAM, such as product design, manufacturing automation, or computer graphics.

The curriculum is designed to accommodate students with varying interests and career goals. In the first year, students are exposed to the fundamentals of CAD/CAM, allowing them to develop a solid understanding of the subject. At the end of the first year, students can choose to transfer to specialized degree programs within CAD/CAM, based on their preferences and aptitude. Throughout the program, students have the freedom to select a significant portion of their module credits, ensuring a well-rounded education that reflects the complexity of CAD/CAM applications.

Practical training is emphasized throughout the program, with dedicated laboratory courses and opportunities for research and real-world projects. Field trips and industrial visits provide students with exposure to the practical applications of CAD/CAM in various industries. Additionally, an independent research project is undertaken in the final year, allowing students to apply their knowledge and skills to solve real-world problems or explore new avenues of research.

Personal tutors and academic advisors guide students through their academic journey, providing mentorship, academic support, and career guidance. The program also encourages international study experiences and industrial placements to broaden students' perspectives and enhance their professional development.

3. Program Objectives

1. To provide a comprehensive education in CAD/CAM, covering theoretical concepts, practical skills, and industry-relevant knowledge.
2. To prepare students for diverse postgraduate paths, including pursuing advanced degrees, entering the workforce, or engaging in research and development.
3. To equip students with hands-on training in CAD/CAM software, hardware, and related technologies, including proficiency in computer-aided design, computer-aided manufacturing, and computer graphics.
4. To foster effective communication skills, both written and oral, to enable students to convey technical information clearly and professionally.
5. To cultivate critical thinking, problem-solving, and analytical skills to address complex CAD/CAM challenges and contribute to innovative solutions.
6. To provide opportunities for students to engage in undergraduate research, internships, and study-abroad programs, allowing them to apply CAD/CAM principles in real-world settings and gain practical experience.

4. Student Learning Outcomes

Upon completion of the CAD/CAM program, students will have achieved the following learning outcomes:

Outcome 1: Proficiency in CAD/CAM Concepts Graduates will demonstrate a deep understanding of CAD/CAM principles, techniques, and technologies, including proficiency in computer-aided design, computer-aided manufacturing, and related software tools.

Outcome 2: Effective Communication Skills Graduates will possess strong oral and written communication skills, enabling them to effectively communicate technical information, collaborate with interdisciplinary teams, and present their work professionally.

Outcome 3: Practical Laboratory and Field Skills Graduates will be able to apply CAD/CAM principles and techniques in practical settings, demonstrating proficiency in laboratory experiments, field studies, equipment operation, and adherence to safety protocols.

Outcome 4: Scientific Knowledge and Historical Context Graduates will demonstrate a comprehensive understanding of the historical development of CAD/CAM, including foundational theories, industry trends, and technological advancements that shape the field.

Outcome 5: Data Analysis and Interpretation Graduates will possess strong quantitative skills, enabling them to conduct data analysis, interpret results, and make informed decisions in CAD/CAM applications.

Outcome 6: Critical Thinking and Problem-Solving Graduates will demonstrate the ability to think critically, analyze complex problems, and develop innovative solutions in the field of CAD/CAM through research projects and practical assignments.

The CAD/CAM program at University of Technology aims to produce well-rounded graduates who are equipped with the knowledge, skills, and attitudes necessary to excel in the ever-evolving field of computer-aided design and computer-aided manufacturing.

5. Academic Staff

Faculty Name	Highest Degree	Title
Aseel Hamad Abed	PhD	**Assistant prof.**
Mohanned M.H. Al-Khafaji	PhD	**Assistant prof.**
Aqeel Sabree Bedan	PhD	**Assistant prof.**
Atiya Al Zuheri	PhD	**Assistant prof.**
Abass Maitham Jabber	PhD	**Assistant prof.**
Mohanad Qusay Abbood	PhD	**Assistant prof.**
Hussam Lefta Alwan	PhD	**Assistant prof.**
Baraa M.H. Albaghdadi	PhD	**Assistant prof.**
Ali Albairy	PhD	**lecture**
Alaa Hassan Shabeeb	PhD	**lecture**
Mazin Al-wswasi	PhD	**lecture**
Ammar Mahdi Saleh	PhD	**lecture**
Mustafa Mohammed Abdulrazaq	M.Sc. / اجازة دراسية	**lecture**

Mostafa Adel Abdullah	M.Sc. / اجازة دراسية	**lecture**
Safaa Kadhim Ghazi	M.Sc. /اجازة دراسية	**lecture**
Nareen Hafidh Obaeed	M.Sc. / اجازة دراسية	**lecture**
Karrar Qahtan Khalaf	M.Sc. / اجازة دراسية	**lecture**
Hind Hadi Abdulridha	M.Sc. / اجازة دراسية	**lecture**
Marwa Qasim Ibraheem	M.Sc. / اجازة دراسية	**lecture**

6. Credits, Grading and GPA

Credits

University of Technology 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 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:				

The Number of 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.

Calculation of the Cumulative Grade Point Average (CGPA)

1. 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 ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MATH111	Mathmatics	93	82	7.00	B	
COPR112	Computer Programing I	63	62	5.00	B	
EDDG113	Engineering Drawing and Descriptive Geometry	65	35	4.00	C	
ELEN114	Electrical Engineering	63	87	6.00	B	
FREL11X	free elective	48	52	4.00	E	
WORK106	Workshop I	93	7	4.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ENME121	Engineering Mechanics	93	82	7.00	C	
MAPR122	Manufacturing Processes I	63	62	5.00	C	
MASC123	Materials Science I	63	62	5.00	C	
CAED124	Computer Aided Engineering Drawing	60	65	5.00	C	EDDG113
FREL1XX	free elective	48	52	4.00	E	
WORK106	Workshop I	93	7	4.00	S	

8. Contact

Program Manager:

Aseel Hamad Abed | Ph.D. in production eng. | Assistant Prof.

Email: aseel.h.abed@uotechnology.edu.iq

Mobile no.: 07711388758

Program Coordinator:

Ali Albairy | Ph.D. in production eng. | Lecture

Email: 70120@uotechnology.edu.iq

Mobile no.: 07736720960

MODULE DESCRIPTION FORM

Module Information			
Module Title	Chemistry 1	Module Delivery	
Module Type	E	● Theory ○ Lecture ○ Lab ○ Tutorial ○ Practical ○ Seminar	
Module Code	CHEM116		
ECTS Credits	4.00		
SWL (hr/sem)	100		
Module Level	UGI	Semester of Delivery	1
Administering Department	Department of Production Engineering and Metallurgy	College	
Module Leader	Dr. Wafaa K. Mahmood Dr.Samar Saadi Hussein Dr.Hayder Naser Hussein Lec.Eman Esam Arif	e-mail	wafaa.k.mahmood@uotechnology.edu.iq Samar.S.Hussein@uotechnology.edu.iq hayder.nasser.iq@gmail.com 70023@uotechnology.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	

Relation with other Modules			

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	The aim of the undergraduate chemistry course is to provide students with a solid foundation in the fundamental principles, theories, and practical aspects of chemistry. This course aims to cultivate students' understanding of the composition, structure, properties, and reactions of matter, while fostering their critical thinking and problem-solving skills. By delving into analytical chemistry, the course aims to equip students with a comprehensive understanding of the chemical sciences. Additionally, the undergraduate chemistry course seeks to instill laboratory techniques, safety protocols, and experimental design principles, enabling students to gain hands-on experience and develop their scientific inquiry and research skills. Ultimately, the goal of the undergraduate chemistry course is to prepare students for further studies and careers in chemistry-related fields, as well as to provide a broader understanding of the role and significance of chemistry in our daily lives and the advancement of scientific knowledge.
Module Learning Outcomes	1. Understanding the basic principles and calculations related to the general chemistry. 2. Analyzing the theoretical aspects of the analytical chemistry problems to understand and solve. 3. Apply the fundamental knowledge gained from the fundamental class in the laboratory session to visualize and evaluate the results.

Indicative Contents	1. To enable Students to understand and solve problems related to the basic principles of Analytical Chemistry. 2. To enable students to understand and solve problems related to volumetric analysis and its sub-disciplines. 3. To enable students to understand and solve problems related to reactions in general and their sub-disciplines. 4. To enable students to be directly engaged with the hands-on chemistry experience by applying the fundamental knowledge gained in the lab.

Learning and Teaching Strategies	
Strategies	The main strategy implemented in the Problem Based Learning (PBL). In PBL, students engage in collaborative and inquiry-based activities to develop critical thinking, problem-solving, and communication skills. Rather than relying on traditional lecture-style teaching, PBL encourages students to take an active role in their learning by identifying and investigating authentic problems, applying knowledge from various disciplines, and working in teams to develop innovative solutions. This approach promotes deeper understanding, as students are motivated by the relevance and authenticity of the problems they encounter. By actively participating in the problem-solving process, students develop essential skills that are transferable to diverse contexts, fostering lifelong learning and preparing them for success in their academic and professional pursuits.

Student \Workload (SWL)			
Structured SWL (h/sem)	48	Structured SWL (h/w)	3
Unstructured SWL (h/sem)	52	Unstructured SWL (h/w)	
Total SWL (h/sem)	100		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10	4,8,12	
	Assignments	4	10	5,7,10	
	Projects /Lab,	2	10	3,7	
	Report				
Summative assessment	Midterm Exam	1	20	9	
	Final Exam	2	50	14	
Total assessment			100		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week1	1. Introduction
Week2	2. Matter and measurements.

	3. Analytical chemistry definitions. 4. Chemical analysis steps.
Week3	1. Formula weight. 2. The mole unit.
Week4	1. Molarity 2. Molality
Week5	Normality
Week6	1. Density and specific gravity. 2. Dilution problems
Week7	1. Expressing concentrations. 2. Concentration types (PPT, PPB, PPM)
Week8	Introduction to Volumetric Analysis
Week9	1. Titrimetric methods of analysis. 2. Requirements for a primary standard.
Week10	1. Molarity volumetric calculations. 2. Normality volumetric calculations.
Week11	Back Titration
Week12	The Titers
Week13	Reactions in Aqueous solutions
Week14	Limiting reactions
Week15	Theoretical Yields

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Non	NA
Recommended Texts	1. "Fundamentals of Analytical Chemistry" by Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R.	Yes

	Crouch Publisher: Cengage Learning 2. "Analytical Chemistry: An Introduction" by Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Crouch Publisher: Cengage Learning	
Websites		

Grading Scheme				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز		
	B - Very Good	جيد جدا		
	C - Good	جيد		
	D - Satisfactory	متوسط		
	E - Sufficient	مقبول		
Fail Group (0 - 49)	E - Sufficient	راسب قيد المعالجه		
	F - Fail	راسب		
Note: Marks with decimal places above or below 0.5 will be rounded to the higher or lower (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- his'd 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

Computer Aided Engineering Drawing (CAED)

Module Information					
Module Title	Computer Aided Engineering Drawing		Module Delivery		
Module Type	C		● Theory ○ Lecture ○ Lab ● Tutorial ○ Practical ○ Seminar		
Module Code	CAED124				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		Semester of Delivery	2	
Administering Department	Branch of CAD/CAM		College	Production Engineering and Metallurgy	
Module Leader	Mazin Ghazi Abdulrazzaq		e-mail	mazin.g.abdulrazzaq@uotechnology.edu.iq	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	PhD	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

Relation with other Modules

Prerequisite module	EDDG113	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outeomes and Indicative Contents	
Module Aims	This module aims to introduce students to SOLIDWORKS in order to equip them with a powerful and versatile tool for 3D modeling and design. By learning SOLIDWORKS, students gain the skills necessary to create intricate and precise virtual representations of objects. This software enables them to explore concepts in engineering and product design. Through hands-on practice and project-based learning, students develop proficiency in utilizing SOLIDWORKS' robust features and tools, enabling them to transform their ideas into tangible, real-world designs.
Module Learning Outcomes	1- Understanding the User Interface: Gain familiarity with the SOLIDWORKS user interface, including navigation, menus, toolbars, and commands. 2- Creating 2D Sketches: Learn how to create and modify 2D sketches using various drawing and editing tools, such as lines, circles, arcs, and constraints. 3- Applying Geometric Relations: Understand how to apply geometric relations, such as coincident, parallel, tangent, and concentric constraints, to establish relationships between sketch entities. 4- Creating 3D Models: Develop the ability to create 3D models by extruding, revolving, sweeping, lofting, and filleting 2D sketches, and manipulating solid bodies. These module learning outcomes aim to provide students with a comprehensive understanding of SOLIDWORKS and its various features, enabling them to effectively utilize the software for design and engineering purposes.

Indicative Contents	1- Introduction to SOLIDWORKS: ● Overview of the software and its applications ● User interface and navigation ● Basic settings and customization options 2- Sketching: ● Creating and editing 2D sketches ● Geometric relations and constraints ● Dimensioning and annotations 3- Basic Part Modeling: ● Extruding and revolving features ● Fillets and chamfers ● Creating holes and threads ● Shell and rib features 4- Advanced Part Modeling: ● Sweeping and lofting features ● Advanced patterns ● Surface modeling techniques ● Multibody modeling and assemblies

Learning and Teaching Strategies	
Strategies	1- Hands-on Practice: Provide students with ample opportunities for hands-on practice with the software. Assign exercises and projects that require students to actively apply their knowledge and skills in creating 2D sketches and 3D models. 2- Demonstrations and Visual Presentations: Use visual presentations and demonstrations to introduce new concepts and features of SOLIDWORKS. Show students step-by-step instructions and examples of how to use different tools and commands within the software. 3- Group or Pair Activities: Encourage collaborative learning by assigning group or pair activities. Students can work together on projects, assemblies, or problem-solving tasks, fostering teamwork and peer learning.

	4- Problem-Based Learning: Present students with real-world design problems or challenges that they can solve using SOLIDWORKS. This approach allows students to apply their knowledge and critical thinking skills to develop practical solutions. 5- Case Studies and Examples: Share case studies or real-life examples where SOLIDWORKS has been used in various industries. This helps students understand the practical applications of the software and how it contributes to the design and manufacturing processes. 6- Interactive Discussions: Facilitate class discussions or Q&A sessions to encourage active participation and engagement. Encourage students to ask questions, share their experiences, and seek clarification on any concepts or techniques they find challenging. 7- Assessments and Feedback: Regularly assess students' progress through assignments, quizzes, or exams that evaluate their understanding and application of SOLIDWORKS. Provide constructive feedback to help students improve their skills and address any misconceptions.

Student \Morkload (SWL)			
Structured SWL (h/sem)	60	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	65	Unstructured SWL (h/w)	4
Total SWL (hlsem)	125		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	30% (30)	4, 8, 13	LO 1, 2, 3, and 4
	Assignments	6	30% (30)	3, 5, 7, 9, 11, 14	LO 1, 2, 3, and 4

	Projects lLab,	-	-	-	-
	Report	-	-	-	-
Summative assessment	Midterm Exam	3 hr	40% (40)		
	Final Exam	-	-	-	-
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week1	1- Introduction to planes (show and hide). 2- Introduction to sketch. 3- Enjoy drawing your first 3D object. 4- Exercises.
Week2	1- Add dimensions (direct and indirect way). 2- Draw a rectangle using 4 lines. 3- Centerline. 4- Exercises.
Week3	1- Circles. 2- Relationships. 3- Simplifying. 4- Exercises.
Week 4	1- Ways to draw a rectangle. 2- Ways to draw an arc. 3- Ways to draw a spline. 4- Polygon. 5- Exercises.
Week 5	1- Fillets. 2- Text. 3- Exercises.

Week6	1- New Plane. 2- Extrude. 3- Exercises.
Week7	Exercises.
Week8	1- Revolve. 2- Sweep.
Week9	Exercises.
Week10	1- 3D Fillets. 2- 3D Linear Pattern.
Week11	Exercises.
Week12	1- 3D Circler Pattern. 2- 3D mirror.
Week13	Exercises.
Week14	1- Shell. 2- Draft. 3- Scale.
Week15	Exercises.

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	1- "Engineering Design with SOLIDWORKS" by David Planchard and Marie Planchard	No

Recommended Texts	1- "SOLIDWORKS 2022: A Power Guide for Beginners and Intermediate Users" by CADArtifex	No
Websites	1- Official SOLIDWORKS Tutorials and Learning Resources: Available on the SOLIDWORKS website, these resources include step-by-step tutorials, videos, and documentation covering various features and workflows. 2- MySolidWorks: An online platform that offers a wide range of SOLIDWORKS tutorials, training videos, and resources for users at different skill levels.	

Grading Scheme				
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
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	E - Sufficient	راسب قيد المعالجه	(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 (for example a mark of 54.5 will be rounded to 55. whereas a mark of 54.4 will be rounded to 54. The Univeisity- has'd policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marler(s) will be the,dutomatic rounding outlined above				

Ministry of Higher Education and Scientific Research

University of Technology

Dep. of Production Engineering and Metallurgy

MODULE DESCRIPTION FORM

Computer Science

Module Information معلومات المادة الدراسية					
Module Title	**Computer Science**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**COSC108**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Mohanned Mohammed Hussein		**e-mail**	Mohanned.M.Hussein@uotechnology.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	PhD	
Module Tutor	1-Dr. Lecturer Muhammed A Mahdi 2- M.Sc. Asst. Prof. Rabab Farhan Abbas		**e-mail**	1-muhammed.a.mahdi@uotechnology.edu.iq 2- Rabab.F.Abbas@uotechnology.edu.iq	
Peer Reviewer Name	Name		**e-mail**	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 Aims أهداف المادة الدراسية	Basic concepts of information and communication technology, Basic computer hardware parts, features and operation principles, Windows operating system's features, Word processors, Spreadsheet softwares, Presentation softwares, database usage, internet and using of email and the features.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this module, students should be able to: 1. Explains the basic concepts of information and communication technologies. 2. Defines the basic concepts of computer. 3. Explains the computer system and how it works. 4. Manages the computer using the Windows operating system. 5. Searches for information on a required topic by using the internet 6. Sends and receives email. 7. Formats a text by using word processing software. 8. Uses objects by using word processing software. 9. Uses the basic features of a spreadsheet program and formats the cell structure. 10. Performs calculations and draws the charts by using a spreadsheet program. 11. Uses the basic features of a presentation program. 12. Prepares a presentation with graphics and effects by using a presentation program. 13. Uses the basic features of a database program. 14. Creates the database on a topic by using a database program. 15. Searches for information on a required topic by using the internet 16. Sends and receives email. 17. Prepares a presentation with graphics and effects by using a presentation program.
Indicative Contents المحتويات الإرشادية	The basic concepts of computer technology, The characteristics and operating principles of basic computer hardware parts, Operating system and features, Internet and the benefits, Word processing software and usage, Spreadsheet software and usage, database software and usage, presentation software and usage, e-mail and usage.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	1. **Interactive Lectures:** Lectures will form the backbone of the teaching strategy for this module, where fundamental concepts and principles of Computer and Offices applications will be introduced. However, these will not be traditional, one-way lectures; they will be made interactive by including in-class exercises, brief discussions, and concept check quizzes. This approach will foster engagement and facilitate immediate feedback. 2. **Practical Lab Sessions:** Lab sessions will be conducted regularly to enhance the practical application of the concepts taught in lectures. These will provide hands-on experience with Computer and Offices applications. 3. **Problem-Based Learning:** This strategy involves presenting students with practical problems to foster their critical thinking, problem-solving, and skills. This could include a range of tasks. 4. **Collaborative Learning:** Students will be encouraged to collaborate on lab assignments, fostering a collaborative learning environment. This not only improves problem-solving skills but also enhances interpersonal and communication skills. 5. **Flipped Classroom:** Some topics can be taught using a flipped classroom approach, where students are given material (like reading assignments or pre-recorded lectures) to review before class. Class time is then used to deepen understanding through discussion and problem-solving activities. 6. **Self-directed Learning:** Outside the classroom, students are expected to engage in self-directed learning, including completing set exercises, preparing for laboratory sessions, further reading, and reflecting on feedback received. 7. **Continuous Assessment:** Regular quizzes and assignments will be used to monitor the student's understanding of the module content. Feedback on these tasks will be provided to aid students in their learning journey. These strategies aim to foster an inclusive, engaging, and effective learning environment, catering to different learning styles while equipping students with theoretical knowledge and practical skills.

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	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2

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, 13	LO #1, 2, 6,7 and 8
	Assignments	2	10% (10)	4, 12	LO # 1,2, 3, 6 and 7
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1, 8 and 9
Summative assessment	Midterm Exam	2 hr	10% (10)	11	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	Basic concepts of information and communication technology
Week 2	Computer Use and File Management
Week 3	Using the Computer and Managing Files
Week 4	Word Processing Software 1
Week 5	Word Processing Software 2
Week 6	Spreadsheet Software
Week 7	Spreadsheet Software 2
Week 8	Presentation Software 1
Week 9	Presentation Software 2
Week 10	Internet and Web 1
Week 11	Mid Exam

Week 12	Internet and Web 2
Week 13	Database Software
Week 14	Database Software 2
Week 15	Sample Applications

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Lab 1: -** Experiments on dismantling of PC.
Week 2	**Lab 2:** Experiments on DOS: Perform these commands internal commands. DIR,TYPE,DEL,ERASE,MD,CD,COPY,RMDIR,VER,DATE,TIME,PAT H, CLS, RMDIR,VER,DATE,TIME,PATH,CLS,BREAK, SET,EXIT.
Week 3	**Lab 3:** Experiments on DOS: Perform external commands APPEND,CHKDISK, ATTRIB, SYS, EDIT.
Week 4	**Lab 4:** Experiments on system utilities:- Explore and describe some system utility like regedit , memory partioning, control panel, window tools
Week 5	**Lab 5:** Experiments on system utilities:- List various keys in registry and perform experiments to back up a key in registry using regedit.
Week 6	**Lab 6:** Experiments on linux:- Perform an experiment to install any rpm or debianlinux distribution withemphasis on drive partitioning.
Week 7	**Lab 7:** Experiments on linux:- Install rpm and deb packages.
Week 8	**Lab 8:** Experiments on linux:- Perfom these commands in linux- chmod, su , chown, chgrp ,ls, mkdir,pwd,date,who, find, uname, wc, ifconfig.
Week 9	**Lab 9:**. Experiments on Office word: Create a office writer document and using tables distinguish between different types of memories.
Week 10	**Lab 10:** Experiments on Office word:- Draft a letter asking for quotations of different peripheral devices for your computer lab and mail the letter using mail merge in open office writer.

Week 11	**Lab 11:** Experiments on Office Powerpoint:- Make a simple presentation on your college, use 3D effects , animation on network topologies.
Week 12	**Lab 12:** Experiments on Office Excel: Create a database of students, which contains marks obtained by students of a class in different subjects and then calculate maximum, minimum, average and sum of marks in each subject. Also calculate % of each student using functions and formulas
Week 13	**Lab 13:** Experiments on Office Excel: draw Charts, piechart and bar graph
Week 14	**Lab 14:** Experiments on Web:- Create HTML pages for your business website.
Week 15	**Lab 15:** Experiments on Web:- Create web pages for your college..

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- Lee H., ***" Programming and Engineering Computing with MATLAB 2021"***, SDC publication, ISBN: 978-1-63057-491-8, Sep.**2021**,. 2- Chaudhuri A.B., ***"Flowchart and Algorithm Basics: The Art of Programming"***, Mercury learning and information, **2020**.	No
Recommended Texts	Attaway S., ***" MATLAB: A practical Introduction to Programming and Problem Solving"***, Department of Mechanical Engineering, Boston University, ELSEVIER, 6 edition,ISBN-13: 978-0323917506, ISBN-10: 032391750X, **2017.**	No
Websites	https://www.mathworks.com/matlabcentral https://www.mathworks.com/support/learn-with-matlab-tutorials.html	

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

Module Information				
Module Title	Democracy and Human Rights			Module Delivery
Module Type				• Theory ○ Lab ○ Lecture ○ Tutorial ○ Practical ○ Seminar
Module Code	DEHR107			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery	2	
Administering Department	PEMT	College	ME	
Module Leader	Muhammed A Mahdi	e-mail	Muhammed.m.mahdi@uotechnology.edu.iq	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PhD	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientilic Committee Approval Date		Version Number		

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	Introducing the student to human rights and its relationship to the democratic system and clarifying its characteristics.
Module Learning Outcomes	Knowledge and Understanding of Historical introduction to democracy. Knowledge and Understanding of The different models of democracy Knowledge and Understanding of Rights and Responsibilities Knowledge and Understanding of civil liberties. Apply quantitative methods for the purpose of explaining and interpreting the idea of rights and democracy. Use Using basic knowledge to examine the historical development of the concept of freedom. Evaluate the information needed to understand different opinions on a common topic.
Indicative Contents	Scientific and research skills are developed through teaching and learning activities. Analysis and problem-solving skills are further developed by means of a set of problems prepared by the lecturers in small study groups and all work submitted is evaluated and responded to.

Learning and Teaching Strategies	
Strategies	1. Lectures and exercises from textbooks. 2. Use practical application program 3. Creating and solving some small projects through the topics (problem-based education). 4. Dividing students into groups for solving a group of engineering problems (student-based education).

	5. Using presentation tools during lectures to represent the above. 6. Visits to industrial companies to understand the work environment. -

Student \Morkload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
Total SWL (hlsem)	125		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5,10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	6,12	LO #3, #4 and #6, #7
	Projects /Lab				
	Report				
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week1	A historical introduction to democracy
Week2	The different models of democracy
Week3	Intellectual positions on democracy
Week4	Intellectual positions on democracy
Week5	Parliament
Week6	basic components of democracy
Week7	Civil society
Week8	The historical development of human rights
Week9	Rights and Responsibilities
Week10	Equality and the law
Week11	the Constitution
Week12	Inalienable rights
Week13	Citizenship concept
Week14	Majority rule and minority rights
Week15	Judicial procedures

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Human rights, children and democracy About the Ministry of Higher Education and Scientific Research	yes
Recommended Texts		No
Websites	Websites related to human rights and democracy.	

Grading Scheme				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90-100	
	B - Very Good	جيد جدا	80-89	
	C - Good	جيد	70-79	
	D - Satisfactory	متوسط	60-69	
	E - Sufficient	مقبول	50-59	
Fail Group (0 - 49)	E - Sufficient	راسب قيد المعالجه		
	F - Fail	راسب		
Note: Marks with decimal places above or below 0.5 will be rounded to the higher or lower (for example a mark of 54.5 will be rounded to 55. whereas a mark of 54.4 will be rounded to 54. The Univeisity- has'd policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marler(s) will be the,dutomatic rounding outlined above				

MODULE DESCRIPTION FORM

Module Information			
Module Title	Electrical Engineering	Module Delivery	
Module Type	basic	×Theory ○ Lecture	
Module Code	ELEN114	×Lab ○ Tutorial ○ Practical ○ Seminar	
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	1
Administering Department	production and metallurgy engineering	College	
Module Leader	Dr. Mohanned M. Hussein	e-mail	mohanned.m.hussein@uotechnology.edu.iq
Module Leader's Acad. Title	Asst. Prof.	Module Leader's Qualification	Ph.D
Module Tutor	Dr.baqer A. ahmed Dr.Ammar M.saleh Vian N. Najm	e-mail	Baqer.A.Ahmed@uotechnology.edu.iq Ammar.M.Saleh@uotechnology.edu.iq vian.n.najm@uotechnology.edu.iq
Peer Reviewer Name		e-mail	
Scientilic Committee Approval Date		Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co- prerequisite module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objective	This module aims to introduce first-year Production Engineering and Metallurgy students to the fundamental principles and laws of electrical engineering. The course will provide a comprehensive understanding of electrical circuit analysis and different circuit response types. It provides students with a solid foundation in the fundamental principles of electrical engineering. Also, it emphasizes the development of critical thinking, problem-solving, and analytical skills necessary for engineering practice. In addition, it encourages interdisciplinary learning and collaboration to address complex technological challenges. Lastly, it seeks to enhance students' employability by fostering practical experience, teamwork, and effective communication skills.
Module Learning Outcomes	Upon successful completion of this module, students should be able to: 1. Understand and apply the basic principles of electrical quantities and circuits. 2. Analyze and solve series and parallel circuits using Delta-Star transformation and equivalent resistance.

	3. Apply Thevenin's theorem, Norton's theorem, and Superposition theorem to simplify and analyze electrical circuits. 4. Apply Kirchhoff's laws in voltage and current analysis. 5. Understand the use of complex numbers in analyzing the response of inductive, capacitive, and RLC circuits. 6. Understand the principle of electromechanical energy conversion. 7. Apply these principles in a lab setting, using measuring instruments to evaluate electrical circuits and systems.
Indicative Contents	1. Definition of Basic Electrical Quantities 2. Series/Parallel Circuits and Delta-Star Transformation 3. Determination of Equivalent Resistance 4. Analysis of Electric Circuits 5. Thevenin's Theorem 6. Norton's Theorem 7. Kirchoff's Law in Voltage and Current 8. Superposition Theorem 9. Maximum Power Transfer 10. Complex Numbers in Circuit Analysis 11. Response of Inductive, Capacitive, and RLC Circuits 12. Principle of Electromechanical Energy Conversion

Learning and Teaching Strategies

Strategies	The course will combine lecture-based teaching with practical lab sessions. Students are expected to participate actively in class discussions and apply the learned theoretical concepts during the lab sessions.

Student \Morkload (SWL)			
Structured SWL (hisem)	63	Structured SWL (h/w)	
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	
Total SWL (hr/sem)	150		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4,8	
	Assignments	2	10% (10)	3,11	
	Projects l Lab,	1	10% (10)	Continues	
	Report	1	10% (10)	12	
Summative assessment	Midterm Exam	2 hr	10% (10)	8	
	Final Exam	2 hr	50% (50)	16	
Total assessment			100% (100)		

Delivery PIan (Weekly Syllabus)	
	Material Covered
Week1	Definition of basic electrical quantities and Ohm's law
Week2	Power and Energy
Week3	Series/Parallel Circuits
Week 4	Delta-Star Transformation and Bridge Networks
Week 5	Determination of Equivalent Resistance
Week6	Electrical Circuit Analysis
Week7	Kirchoff 's voltage and current laws
Week8	Thevenin’s Theorem
Week9	Norton’s Theorem
Week10	Midterm exam
Week11	Super-position Theorem
Week12	Maximum Power Transfer
Week13	Voltage sources in series and parallel circuits
Week14	AC Circuit Analysis (Inductive, Capacitive and Resistive circuits)
Week15	Transformers
Week16	Final Exam

Delivery Plan (Weekly Lab. SyUabus)	
	Material Covered
Week 1	Electrical Resistance color standard, and Using measuring devices (ammeter, voltmeter, ohmmeter) to measure resistance
Week2	Ohm's law, Series and parallel circuits.
Week 3	Kickoff’s current and voltage laws

Week4	Thevenin's theorem and Norton’s Theorem
Week5	Conversion from star to delta and vice versa
Week6	Bridge network
Week7	Superposition Theorem and Maximum Power Transfer

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	"A text book of electrical technology", B.L.Theraja	yes
Recommended Texts	1. "Principles of Electric Circuits: Conventional Current Version", 9th edition, Thomas L. Floyd. 2. "Fundamentals of Electrical Engineering", 1st edition, Leonard S. Bobrow. 3. "Introduction to Electrical Engineering", Mulukutla S. Sarma.	no
Websites		

Grading Scheme				
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)	E - Sufficient	راسب قيد المعالجه	45-49	More work required but credit awarded
	F - Fail	راسب	0-40	Considerable amount of work required
Note: Marks with decimal places above or below 0.5 will be rounded to the higher or lower (for example a mark of 54.5 will be rounded to 55. whereas a mark of 54.4 will be rounded to 54. The Univeisity- has'd policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marler(s) will be the,dutomatic rounding outlined above				

Ministry of Higher Education and Scientific Research

University of Technology

Dep. of Production Engineering and Metallurgy

MODULE DESCRIPTION FORM

Manufacturing Processes I

Module Information معلومات المادة الدراسية					
Module Title	**Manufacturing Processes I**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MAPR122**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Mohanned Mohammed Hussein		**e-mail**	Mohanned.M.Hussein@uotechnology.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	PhD	
Module Tutor	1- Asst. Prof. Dr. Saad Karim Shather 2- Asst. Prof. Dr. Aqeel Sabree Bedan 3- Asst. Prof. Dr. Makarim H. Abdulkareem		**e-mail**	1- Saad.K.Shather@uotechnology.edu.iq 2- Aqeel.S.Bedan@uotechnology.edu.iq makarim.h.abulkareem@uotechnology.edu.iq	
Peer Reviewer Name	Name		**e-mail**	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 Aims أهداف المادة الدراسية	1. Recognize, understand and develop working knowledge of broad range ofmanufacturing processes that are used in the industry. 2. To compare the existing technologies used in casting, shaping, forming, property enhancing, joining and assembly process. 3. To apply the limitations and advantages of different manufacturing processes with an economic point of view to the industry. 4. To learn how component can be manufactured in sustainable manner and learn about the environmental hazards of different manufacturing processes. 5- Provide an understanding of the effect of such techniques on design constraint, microstructure and properties.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students are able to: 1- Describe the manufacturing processes and material behavior as used in engineering practice. 2- Explain how the features and limitations of various manufacturing methods and materials are the key to success in engineering design work. 3- Use engineering drawings to communicate design ideas and make mechanical engineering components. 4- Analysis of a mechanical engineering component to determine the likely methods used in its manufacture and joining. 5- Select an appropriate manufacturing method for a given geometry and material. 6- Demonstrate personal initiative in individual and group work. 7-Understand/appreciate the range of materials, technologies and processes involved in manufacturing 8- Students will demonstrate knowledge of process capabilities of major manufacturing Processes.

Indicative Contents المحتويات الإرشادية	1-Students will demonstrate the ability to understand the principles of production engineering (machines, materials , tools and manufacturing parts) to solve problems in manufacturing. 2- Students will demonstrate the ability to carry out manufacturing process design based on first principles On material science. 3- This module will introduce the student to the principles of the manufacturing process . 4- Students will learn the chemical composition of materials and the technology processes for manufacturing parts.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The strategy of this module must be starting from raw material to final product, using machines, operations with tools which are necessary to product. otherwise manufacturing processes required good knowledge and experience of machine tools and operations.

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	62	**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)	3, 13	LO #1, 2, 6,7 and 8
	Assignments	2	10% (10)	2, 11	LO # 1,2, 3, 6 and 7
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1 , 9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	10	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, classification manufacturing process
Week 2	Casting methods, sand casting, types of molds. Types of sands
Week 3	types of patterns, casting defects, Furnaces for Casting Processes
Week 4	Die casting. Centrifugal casting and investment casting Lost wax casting
Week 5	Joining and Assembly. Welding, brazing and soldering
Week 6	Arc welding, Gas metal arc welding, friction welding
Week 7	Non-conventional welding processes
Week 8	Plastic deformation, Hot Working, Cold Working
Week 9	Rolling
Week 10	Forging, **extrusion**
Week 11	**wire drawing, deep drawing**
Week 12	Shearing, bending

Week 13	Hand and mechanical machining. turning
Week 14	Milling, grinding, other processes.
Week 15	Powder Metrology

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	- Sand Particle Size Distribution Measurements
Week 2	Introduction to the available type of manufacturing process
Week 3	Measurement of Moisture in Sand molding
Week 4	Permeability Calculation in sand molding
Week 5	Permeability Calculation in sand molding
Week 6	Compatibility Test in sand molding
Week 7	Compatibility Test in sand molding
Week 8	Compression Strength testing for Wet and Dry Sand molding
Week 9	Microstructure Studying of weld zone in Carbon steel
Week 10	Microstructure Studying of weld zone in Carbon steel
Week 11	Comparisons of the weld zone in Electric Arc Welding and Gas Welding
Week 12	Comparisons of the weld zone in Electric Arc Welding and Gas Welding
Week 13	Hardness measurements for weld zone
Week 14	Studying the effect of welding parameters on the properties in spot welding
Week 15	Studying the effect of welding parameters on the properties in spot welding

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	***1-*** Mikell P. Groover, [Principles of Modern Manufacturing], 4th edition, John Wiley & Sons , 2011 ***2-*** R.T. Wright, [Processes of Manufacturing], Goodheart-Willcox, 2005 ***3-*** H. N. Gupta, R, C. Gupta and A. Mittal, manufacturing processes, 2009.	No
Recommended Texts	***1-*** R. singh, introduction to basic manufacturing processes and workshop technology, 2006.	No
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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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

Module Information				
Module Title	Materials Science I			Module Delivery
Module Type	Core			• Theory • Lab ○ Lecture ○ Tutorial ○ Practical ○ Seminar
Module Code	MASC123			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	1	Semester of Delivery	2	
Administering Department	PEMT	College	ME	
Module Leader	Ali Mezher resen	e-mail	Ali.M.Resen@uotechnology.edu.iq	
Module Leader's Acad. Title	Asst. Prof.	Module Leader's Qualification	PhD	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientilic Committee Approval Date		Version Number		

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1. Define and understanding of materials science and materials engineering. 2. Explain the types of materials and classifying depending on types or usage. 3. Define the basic concept of atoms and electron configuration and activity of valence for bonding atoms. 4. The basic subject of Types of Crystals and all parameters concern with characteristic of crystal systems. 5. To develop problem solving skills and understanding of plans, direction, density and atomic packing factors. 6. Define the mechanical properties and developing the skills to solve problems of stress-strain curves, hardness, impacts, and fatigue. 7. Define the imperfections of crystals and its types 8. Explain the microscopic examination and types of its instrument.
Module Learning Outcomes	1. Knowledge the metals, ceramics, polymer and composite and properties of each branch. 2. Understanding the properties and applications of each type of engineering material. 3. Development skills of determination of types of element bonding and valence. 4. Understanding the types of crystal structure systems and development skill to identification between them. 5. Development skill to calculate the density and atomic number depending on types of materials. 6. Knowledge the mechanical properties such as engineering tress, engineering strain, true stress, true strain, poison ratio, ductility. 7. Understanding and development the skill for hardness calculations, fatigue and impact properties. 9. Understanding the imperfections of crystals point defect such as vacancies and calculation number of its. 10. Define the edge and screw dislocations and method to determination of it. 11. Define the types of microscopes and usage of each type, Understanding the method to determine the particles size.

Indicative Contents	Collecting and arranging engineering data for various engineering materials. Solve it and analyze the results of the electrical properties of various metallic elements and bonding. (15 Hrs.) Study unit cell, lattice, lattice parameters, directions linear density (15 Hrs.) Repeat distance, Packing fraction of directions, plans, planar density, HCP. (15 Hrs.) Engineering tress, engineering strain, true stress, true strain, poison ratio, ductility. (12 Hrs.) Hardness, fatigue and impact properties. (12 Hrs.) Vacancies, edge dislocations, screw dislocations (12 Hrs.) Light microscope, scanning electron microscope, transmition electron microscope, ASTM grain size number and number of grains per square inch (8 Hrs.)

Learning and Teaching Strategies	
Strategies	1. Lectures and exercises from textbooks. 2. Use practical application program 3. Creating and solving some small projects through the topics (problem-based education). 4. Dividing students into groups for solving a group of engineering problems (student-based education). 5. Using presentation tools during lectures to represent the above. 6. Visits to industrial companies to understand the work environment. -

Student \Morkload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	4
Total SWL (hlsem)	125		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5,10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	6,12	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	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week1	Introduction , Materials science and Materials engineering Types of Engineering Materials and its properties
Week2	The structure of the Atom, The Electronic configuration of the Atom and valance The Periodic table
Week3	Types of Atomic Bonding and its properties Metallic bonding, Covalent bonding Ionic bonding, Vander Waals bonding
Week4	Types of Crystals, Unit cells no order, short range order , long range order unit cell, Lattice, Crystal structure, Number of atoms per unit cell
Week5	Atomic radius vs lattice parameters Coordination No., Atomic Packing factor Density, Allotropic Transformation
Week6	Points, Directions in the Unit Cell Miller indices, Linear density Repeat distance, Packing fraction of directions

Week7	Midterm Exam
Week8	Planes in the Unit Cell Miller indices, planar density Repeat distance, Packing fraction of plans
Week9	Miller indices for HCP, 3D to 4D conversion Isotropic and anisotropic, sodium chlorine structure Interatomic Spacing, diffraction technique for crystal structure analysis
Week10	Mechanical properties of materials Terminology for Mechanical Properties, tensile test stress- strain curve and its types, engineering stress and strain, strength
Week11	Yield strength, Tensile strength, Elastic and plastic properties Stiffness, Poisson ratio Modules of resilience
Week12	True stress and strain, Ductility, Effect of temperature on mechanical properties Hardness of materials, Types of hardness
Week13	Impact test technique Ductile to brittle transition temperature (DBTT) Fatigue and its types
Week14	Imperfections of crystals and its types vacancies and self-interstitials impurities in solids, dislocations−linear defects interfacial defects
Week15	microscopic examination, optical microscopy, electron microscopy transmission electron microscopy, scanning electron microscopy, grain size determination
Week16	Final exam

Delivery Plan (Weekly Lab. SyUabus)	
	Material Covered
Week1	Types of Microscopes
Week2	Specimen preparation for Microstructure Examination
Week 3	Crystal structure of Metals
Week4	Solidification of Ingots
Week5	Ingots Defects

Week6	Methods of Hardness Measurement
Week7	Cooling Curves

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Fundamentals of Materials Science and Engineering , William D. Callister & David G.Rethwisch	yes
Recommended Texts	The Science and Engineering of Materials , Donald R. Askeland,	No
Websites		

Grading Scheme				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90-100	
	B - Very Good	جيد جدا	80-89	
	C - Good	جيد	70-79	
	D - Satisfactory	متوسط	60-69	
	E - Sufficient	مقبول	50-59	
Fail Group (0 - 49)	E - Sufficient	راسب قيد المعالجه		
	F - Fail	راسب		

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

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Production Engineering and Metallurgy	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics**			**Module Delivery**	
Module Type				☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code					
ECTS Credits					
SWL (hr/sem)					
Module Level	1		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Mohanad Qusay Abbood		**e-mail**	mohanad.q.abbood@uotechnology.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	27/06/2023		**Version Number**		

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 Aims أهداف المادة الدراسية	In this course, the student will be learning the basic concepts of calculus (differentiation and integration) and the skills and method of doing (differentiation and integration), this course also includes some applications, especially engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of the module the student is expected to be able to: LO1 Explain the rule of differentiation. LO2 use the derivative in optimization problems LO3 the integration and the methods of integrations with its applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Functions [12 hrs.] Differentiation [12 hrs.] Applications of Differentiation [18 hrs.] Integration [6 hrs.] Applications of definite integrals [12 hrs.] Techniques of Integration [18 hrs.]

Course Description	
Course Description	This is a two-course sequence in the differential and integral calculus of functions of one independent variable. Topics include the basic analytic geometry of graphs of functions, integrals and derivatives, including the Fundamental Theorem of Calculus. Also, some applications of the integral, like volumes of solids with rotational symmetry, are discussed. Applications to the physical sciences and engineering will be a focus of this course, as this sequence of courses is designed to meet the needs of students in these disciplines.

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 type of assignments involving some problem solving 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	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	160		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	5 % (5)	5 and 11	LO # 1, #2, #3, #4 and #9, #10
	Assignments	2	5 % (5)	4 and 12	LO # 3 and #10, #11
Summative assessment	**Midterm Exam**	2 hrs.	20 % (20)	8	LO # 1- #7
	Final Exam	3 hrs.	70 % (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Functions (Graph, combining functions, Shifting, Scaling, Reflecting, odd & even function)
Week 2	Functions (Trigonometric functions, Exponential functions, Inverse function and logarithms)
Week 3	Differentiation (Definition of the derivative, differentiation rules, derivatives of common functions, chain rule and implicit differentiation)
Week 4	Derivatives of trigonometric, exponentials, logarithms, and Inverse functions.
Week 5	Applications of Differentiation (related rate)
Week 6	Applications of Differentiation (applied optimization)
Week 7	Applications of Differentiation (moments and centers of mass)

Week 8	Mid. Review and Mid. Term exam
Week 9	Integration (indefinite integral and definite integrals)
Week 10	Applications of definite integrals (Area)
Week 11	Applications of definite integrals (Volume by cross section area)
Week 12	Techniques of Integration (Integration by Parts and Trigonometric Integrals)
Week 13	Techniques of Integration (Trigonometric Substitutions)
Week 14	Techniques of Integration (Integration of Rational Functions by Partial Fractions)
Week 15	Laplace transform
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas Calculus, GEORGE B. THOMAS, JR. 14 edition	Yes
Required Texts	Engineering Mathematics, John Bird	Yes
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.

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Production Engineering and Metallurgy	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mechanics**			**Module Delivery**	
Module Type	C			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENME121				
ECTS Credits	7.00				
SWL (hr/sem)	175				
Module Level	1		**Semester of Delivery**	2	
Administering Department			**College**		
Module Leader	Qussay Salah Mahdi		**e-mail**	qussay.s.mahdi@uotechnology.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	27/06/2023		**Version Number**		

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 Aims أهداف المادة الدراسية	In this course, the student will be learn the basic concepts of forces, resultant force, Equilibrium, Centered- center of mass, friction and moments that affect the static and dynamic body in two dimensions and three dimensions including their applications especially engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of the module the student is expected to be able to: LO1 Resolving any force to its components in X, Y and Z- direction. LO2 Unification of any force system into a resultant force. LO3 Evaluation of equilibrium state of the rigid body. LO4 Evaluation of the centroid of the bodies. LO5 Evaluation of the friction forces acting the bodies.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Static Bodies [18 hrs.] Resultant Force [18 hrs.] Equilibrium [18 hrs.] Centroid [6 hrs.] Moment [18 hrs.] Friction [12 hrs.] Force, mass, acceleration [18 hrs.] Force, energy and power [18 hrs.] Impulse and momentum [18 hrs.]

Course Description	
Course Description	This is a one-course in the forces, resultant forces, moments, equilibrium, friction, energy, power and impulse that affects statics and dynamics of bodies. This capacity requires more than a mere knowledge of the physical and mathematical principles of mechanics; also required is the ability to visualize physical configurations in terms of real materials, actual constraints, and the practical limitations which govern the behavior of machines and structures. There is a frequent tendency in the presentation of mechanics to use problems mainly as a vehicle to illustrate theory rather than to develop theory for the purpose of solving 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 and homework's, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of assignments involving some problem solving 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	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	160		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	5 % (5)	5 and 11	LO # 1, #2, #3, #4 and #9, #10
	Assignments	2	5 % (5)	4 and 12	LO # 3 and #10, #11
Summative assessment	**Midterm Exam**	2 hrs.	20 % (20)	8	LO # 1- #7
	Final Exam	3 hrs.	70 % (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to mechanics of bodies

Week 2	Static bodies
Week 3	Resolving of system of forces
Week 4	Resultant of force
Week 5	Equilibrium
Week 6	Centered- center of mass
Week 7	Moment of inertia
Week 8	polar moment of inertia
Week 9	Distributed force- friction
Week 10	Moving bodies
Week 11	Absolute motion
Week 12	Force, mass, acceleration
Week 13	Force, energy and power
Week 14	Impulse and momentum
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Engineering Mechanics Volume 1 Statics Seventh Edition, J. L. Meriam L. G. Kraige	Yes
Required Texts	DYNAMICS TWELFTH EDITION R. C. HIBBELER	Yes
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 59.5 will be rounded to 60, 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	**Physics I**			**Module Delivery**	
Module Type	**Elective**			✓ ☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHYS116**				
ECTS Credits	**5:00**				
SWL (hr/sem)	**125**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department		Department of Production Engineering and Metallurgy	**College**	Metallurgy Engineering	
Module Leader	Maryam Abdul-adheem Ali Bash		**e-mail**	Maryam.a.alibash@uotechnology.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			**Version Number**		

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. a deep understanding of their subjects 2. higher order thinking skills - analysis, critical thinking, problem-solving 3. presenting ordered and coherent arguments. 4. independent learning and research.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. understand that all physical quantities consist of a numerical magnitude and a unit. 2. recall the following SI base quantities and their units: mass (kg), length (m), time (s), current (A), and temperature (K). 3. understand the difference between scalar and vector quantities and give examples of scalar and vector 4. define and use distance, displacement, speed, velocity, and acceleration. 5. use graphical methods to represent distance, displacement, speed, velocity, and acceleration. 6. derive, from the definitions of velocity and acceleration, equations that represent uniformly accelerated motion in a straight line. 7. solve problems using equations that represent uniformly accelerated motion in a straight line, including the motion of bodies falling in a uniform gravitational field without air resistance. 8. describe an experiment to determine the acceleration of free fall using a falling object. 9. understand that mass is the property of an object that resists change in motion 10. recall F = ma and solve problems using it, understanding that acceleration and resultant force are always in the same direction. 11. define and use force as the rate of change of momentum 12. state and apply each of Newton's laws of motion. 13. describe and use the concept of weight as the effect of a gravitational field on a mass and recall that the weight of an object is equal to the product of its mass and the acceleration of free fall. 14. Describe other examples of forces such as: Normal and Tension forces. 15. Solving further examples on Newton's Laws of motion.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Physical quantities and units Physical quantities, SI units, base quantities and their units, derived quantities and units, prefixes and their symbols, the distinction between precision and accuracy, scalar and vector quantities. 2- Kinematics

	One-dimensional Kinematics: distance, displacement, speed, velocity, and acceleration definition, graphical methods to represent distance, displacement, speed, velocity, and acceleration, and Equations of motion at a constant acceleration. Two- dimensional Kinematics: Vector Addition and Subtraction (Graphical and Analytical method), Projectile motion. 3- Dynamics Force and mass definition, Types of Forces, Newton's laws of motion, weight, Normal and Tension forces, Other types of forces such as: Friction and drag force.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Physics learning involves doing things, exploring ideas, making connections, examining assumptions, and making things. It is the student's mind that should be active. Understanding: Ability to explain something to oneself and/or to others – Emphasis on internal effect. This will be achieved through Telling stories about the topic makes the connection between people and ideas. It can also help build trust between teachers and students. Students pay more attention and show more interest in stories. So, stories can make topics easier for students to understand.

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	77	**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	3 and 10	
	Assignments	2	10	5 and 12	
	Projects / Lab.				
	Report	1	10	13	

Summative assessment	**Midterm Exam**	2hr/ 1	20	7	
	Final Exam	3hr/2	50	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Physics: An Introduction, Physical Quantities, and Units.
Week 2	SI Units: Fundamental and Derived Units.
Week 3	Fundamentals of Linear Motion (scalar and vector quantities)
Week 4	Displacement, Time, Velocity, Speed, and Acceleration.
Week 5	Equations of (Constant Acceleration) Motion
Week 6	Types of Graphical Representation of Motion
Week 7	Midterm Exam.
Week 8	Falling Objects
Week 9	Motion in a Plane Introduction to Two-Dimensional Kinematics
Week 10	Vector Addition and Subtraction: Graphical Method Vector Addition and Subtraction: Analytical Method
Week 11	Projectile Motion + Examples
Week 12	Introduction to Dynamics: Types of Forces.
Week 13	Newton's Laws of Motion
Week 14	Examples of Newton's laws
Week 15	Normal, Tension, and Other Examples of Forces
Week 16	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	Non	
Recommended Texts	**College Physics, PAUL PETER URONE and ROGER HINRICHS, 2020 Rice University**	Yes
Websites	visit https://openstax.org.	

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.

Ministry of Higher Education and Scientific Research

University of Technology

Dep. of Production Engineering and Metallurgy

MODULE DESCRIPTION FORM

Programming I

Module Information معلومات المادة الدراسية					
Module Title	**Programming I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**COPRO112**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Mohanned Mohammed Hussein		**e-mail**	Mohanned.M.Hussein@uotechnology.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	PhD	
Module Tutor	1-Dr. Lecturer Ali Mohammed Jassem 2- M.Sc. Asst. Prof. Rabab Farhan Abbas		**e-mail**	1- Ali.M.Jassem@uotechnology.edu.iq 2- Rabab.F.Abbas@uotechnology.edu.iq	
Peer Reviewer Name	Name		**e-mail**	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 Aims أهداف المادة الدراسية	This module aims to introduce students to MATLAB as a programming language, providing a robust foundation in MATLAB's functionality and addressing the practical implementation of problem-solving algorithms. The course, intended for students with no programming experience, provides the foundations of programming in MATLAB®. Students will learn essential programming variables, arrays, conditional statements, loops, functions, constructs, data analysis, visualization techniques using plots are explained, and the application of MATLAB for numerical computations. At the end of the course, students should be able to use MATLAB in their work and be prepared to deepen their MATLAB programming skills and tackle other languages for computing, such as Java, C++, or Python.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this module, students should be able to: 1. Knowing the components of a computer system and the functions of each part, hardware, and software components, and their importance in the work of the computer, also building Algorithms, Flowcharts, and their importance in writing codes for any mathematical or industrial problems. 2. Understand the basics of MATLAB as a programming language. 3. Knowing the MATLAB environment, also undertake format numbers, variables, and Priority in Operations Mathematics. 4. Construct and perform arithmetic and logical operations on scalars and matrices and execute special commands for vectors and matrices. 5. Create, run, and debug MATLAB scripts and functions. 6. Implement basic algorithms and data structures using MATLAB. 7. The students can build programs to solve many problems by merging the above outcomes. 8. Utilize MATLAB's in-built functions and toolboxes for numerical computation. 9. Visualize data effectively using MATLAB plotting techniques.
Indicative Contents المحتويات الإرشادية	1. **Computer Hardware and Algorithm:** Getting a brief introduction to computer hardware and understanding the principle of computer algorithms. Also, the flowcharts symbolize and construction. (4 hours lecture, 2 hours lab) 2. **Introduction to MATLAB:** Understanding the MATLAB environment, variables, operators, and data types. (4 hours lecture, 2 hours lab))

	3. **MATLAB Programming Basics:** Scripts, functions, control structures (if-else statements, loops), and error handling. (6 hours lecture, 6 hours lab) 4. **MATLAB Data Structures:** Vectors, matrices, and cell arrays. (6 hours lecture, 6 hours lab). 5. **File Input/Output in MATLAB:** Importing and exporting data. (4 hours lecture, 2 hours lab) 6. **Basic Data Analysis and Visualization:** Statistical analysis, curve fitting, and plotting. (4 hours lecture, 4 hours lab)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. **Interactive Lectures:** Lectures will form the backbone of the teaching strategy for this module, where fundamental concepts and principles of MATLAB programming will be introduced. However, these will not be traditional, one-way lectures; they will be made interactive by including in-class exercises, brief discussions, and concept check quizzes. This approach will foster engagement and facilitate immediate feedback. 2. **Practical Lab Sessions:** Lab sessions will be conducted regularly to enhance the practical application of the concepts taught in lectures. These will provide hands-on experience with MATLAB. The students will be tasked with solving real-world problems, emphasizing the practical relevance of their learning. 3. **Problem-Based Learning:** This strategy involves presenting students with practical problems to foster their critical thinking, problem-solving, and programming skills. This could include a range of tasks, from simple debugging exercises to more complex problems that require the application of various programming concepts. 4. **Collaborative Learning:** Students will be encouraged to collaborate on lab assignments, fostering a collaborative learning environment. This not only improves problem-solving skills but also enhances interpersonal and communication skills. 5. **Flipped Classroom:** Some topics can be taught using a flipped classroom approach, where students are given material (like reading assignments or pre-recorded lectures) to review before class. Class time is then used to deepen understanding through discussion and problem-solving activities. 6. **Self-directed Learning:** Outside the classroom, students are expected to engage in self-directed learning, including completing set exercises, preparing for laboratory sessions, further reading, and reflecting on feedback received.

	7. **Continuous Assessment:** Regular quizzes and assignments will be used to monitor the student's understanding of the module content. Feedback on these tasks will be provided to aid students in their learning journey. These strategies aim to foster an inclusive, engaging, and effective learning environment, catering to different learning styles while equipping students with theoretical knowledge and practical 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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**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, 13	LO #1, 2, 6,7 and 8
	Assignments	2	10% (10)	4, 12	LO # 1,2, 3, 6 and 7
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1, 8 and 9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	11	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 Algorithms fundamentals.
Week 2	Introduction to flowcharts and MATLAB environment; (Format numbers, Variables and Priority in Operations Mathematics).
Week 3	Construction and handling vectors, matrices, and cell arrays using MATLAB environment using different methods and special commands.
Week 4	Arithmetic operators and some MATLAB built-in functions.
Week 5	Execute Special commands for vectors and matrices.
Week 6	Programming using Scripts and Function files with examples,
Week 7	File input/output with examples.
Week 8	Relational and Logical operations.
Week 9	Conditional statements
Week 10	Loops and examples
Week 11	Mid Exam
Week 12	Examples of using conditional statements, looping, and Logical operations.
Week 13	Two-dimensional plotting
Week 14	Three-dimensional plotting
Week 15	Overview with examples

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Lab 1:** - See the computer parts and explain the function of each part. - Dealing with Algorithms and homework.
Week 2	**Lab 2:** - Dealing with flow charts

	- Learn to install MATLAB program, Install MATLAB mobile, dealing with MATLAB Cloud. - Explanatory introduction on how to use MATLAB program, MATLAB windows, Variables definition, perform different arithmetic operations, use Coma and Semicolon, homework.
Week 3	**Lab 3:** Practical exercises on Vectors and Matrices within MATLAB environment using different methods and special commands, homework.
Week 4	**Lab 4:** Practical exercises on executing arithmetic for vectors and matrices. Also, using some built-in functions and homework.
Week 5	**Lab 5:** Application of Special commands for vectors and matrices, homework.
Week 6	**Lab 6:** Application of programming using script and function files, homework.
Week 7	**Lab 7:** file input/output practicing.
Week 8	**Lab 8:** Perform and application of conditional statements with different types and programs homework.
Week 9	**Lab 9:** Perform and application of looping statements with different types and programs, homework.
Week 10	**Lab 10:** Mid-laboratory exam.
Week 11	**Lab 11:** Programming and application of Logical and comparison operations, homework.
Week 12	**Lab 12:** Programming different examples of conditional statements, looping, Logical operations, and homework.
Week 13	**Lab 13:** Plot different mathematical and trigonometric functions (two-dimensional plotting). - Draw more than one curve in the same drawing. - Drawing more than one diagram in a single format-using subplots (m, n, p). - homework.
Week 14	**Lab 14:** Three-dimensional plotting (3D plot, surface, and Mesh-grid), homework.
Week 15	**Lab 15:** different programs overview applications.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- Lee H., ***" Programming and Engineering Computing with MATLAB 2021"***, SDC publication, ISBN: 978-1-63057-491-8, Sep.**2021**,. 2- Chaudhuri A.B., ***"Flowchart and Algorithm Basics: The Art of Programming"***, Mercury learning and information, **2020**.	No
Recommended Texts	Attaway S., ***" MATLAB: A practical Introduction to Programming and Problem Solving"***, Department of Mechanical Engineering, Boston University, ELSEVIER, 6 edition,ISBN-13: 978-0323917506, ISBN-10: 032391750X, **2017.**	No
Websites	https://www.mathworks.com/matlabcentral https://www.mathworks.com/support/learn-with-matlab-tutorials.html	

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.

First and Second Semester

Module 1

Module Information			
Module Title	Workshops		Module Delivery
Module Type	Support		☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ■ Practical ☐ Seminar
Module Code	WORSH11		
ECTS Credit/year	4		
SWL/year	100		
Module level	1	Semester of Delivery	1, 2
Module Leader	Training and Workshops Center	College	
Module Leader Academic Title	Prof.	e-mail	twc@uotechnology.edu.iq
Module Tutor	TE-UOT-027131111-15	Module Leader's Qualification	Ph.D.
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	1/6/2023	e-mail	
		Version Number	1

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	1-Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. 2. Enable the student to know and understand work systems, risks, and the factors surrounding them. 3. Enable the student to know and understand theoretical principles in handicrafts and measurements.
Module Learning Outcomes	1- To familiarize the student with the vocabulary of occupational safety and its importance in the field of work. 2- Acquisition of the student's manual operation skills, for example (Filings and

	Tinsmith workshops), and mechanical operation skills, for example (Turning). 3- Acquisition of the student's mechanical forming skills, for example (Casting and Blacksmithing). 4- The student acquires basic engineering skills such as Welding, Carpentry, and Electrical installations that serve him in the professional field. 5- Enabling the student to operate the various machines and devices in mechanical operations and formation. 6- Cooperative learning by working collectively.
Inductive Contents	1. Introducing the student to the basics of the art of turning and milling, types of cold working machines, the skill of dealing with them, choosing metals, operational tools, and methods of measurement and standardization 2. Introducing the student to the basics of the art of casting, hot forming, metal selection, method of working on casting furnaces and tools, and manufacturing casting molds 3. Familiarize students with the basics of cars and the systems they use, as well as maintenance, disassembly, and assembly processes. 4. Introducing students to the basics of household and industrial electrical appliances, the skill of using tools, and designing electrical circuits and control panels 5. Introducing the student to the basics of the art of plumbing, leveling surfaces, the skill of using tools, manufacturing and installing geometric shapes, and methods of measurement and standardization 6. Introducing the student to the basics of the art of blacksmithing, cold and hot forming of metals, the method of hardening them, and the skills of dealing with hand tools, forming machines, and heating furnaces 7. Introducing the student to the basics of the art of filing and manual operation of metals with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and the methods of measurement and standardization 8. Introducing the student to the basics of the art of welding, the installation and assembly of metals, the types of welding machines, the skills of dealing with them, the types of welding, and the methods of measurement and standardization 9. Introducing the student to the basics of the art of carpentry and woodworking with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and methods of measurement and standardization

Learning and Teaching Strategies	
Strategies	

Student Workload (SWL)			
Structured SWL (h/sem)	46.5	Structured SWL (h/w)	3.00
Unstructured SWL (h/sem)	3.5	Unstructured SWL (h/w)	0.23
Total SWL (h/sem)	50		
Structured SWL (h/year)	93	Structured SWL (h/w)	3.00
Unstructured SWL (h/year)	7	Unstructured SWL (h/w)	0.23
Total SWL (h/year)	100		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes				
	Assignments				All
	Projects / Practice	Every 3 weeks	60%	Continuous	
	Report				
Summative Assessment	Midterm Exam				
	Exam	Every 3 weeks	40%	Continuous	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Welding workshop. -Occupational safety and its importance in welding workshops. -Introduction to the basics of welding. -Electric arc exercise. -An exercise for welding straight lines in a circular motion (helical).
Week 2	Welding workshop - An exercise for welding straight lines with a crescent movement and other welding methods -Construction welding exercise.
Week 3	Welding workshop. -Welding two pieces together. - -Written exam in practical exercises.
Week 4	Casting workshop -Occupational safety and its importance in plumbing workshops.

	-Introduction to the basics of metal casting. -Simple wooden disc exercise. Half workout.
Week 5	Casting workshop Wheel exercise. Pushing arm exercise.
Week 6	Casting workshop. -Complete pulley exercise. -Circular pole exercise. -Written exam in practical exercises.
Week 7	Blacksmith Workshop -Occupational safety and its importance in blacksmithing workshops. -Introduction to the Basics of Blacksmithing. - Barbell adjustment exercise. -Eight-star exercise. - Exercise forming the number eight in English. -Six formation exercises in English.
Week 8	Blacksmith Workshop -An exercise forming the number five in English. - Exercise forming the number nine in English. . -An exercise in forming an iron model in the form of a circle
Week 9	Blacksmith Workshop - S-shape exercise. - Air hammer hot barbell exercise. - Exercise to form a circle on an electric bending machine. - Exercising cold and hot ornament formation. .- A written exam in practical exercises
Week 10	Automotive Workshop -Occupational safety and its importance in car maintenance workshops. -An introduction to cars and their basic parts. -Parts of the engine, how it works, types of engines, and methods of classification.
Week 11	Automotive Workshop - Open the engine and identify the parts -Lubrication system -Cooling system.
Week 12	Automotive Workshop -The fuel system. -The old and new ignition circuits. -Written exam in practical exercises.
Week 13	Turning Workshop -Introduction to lathe machines and identifying their parts -Measuring tools and the use of an oven measuring instrument

	-Circular column lathing exercise on different diameters.
Week 14	Turning Workshop -Exercise using the pen (semicircular R) brackets. An exercise in making different angles using a pen (square + angle pen 55).
Week 15	Turning Workshop - Making shaft with different diameter exercises using (left and right pen) - Workout (Tube Connection). -Written exam in practical exercises.
Week 16	Fitting workshop Occupational safety and its importance in filing workshops -An introduction to the basics of filing -Pen holder exercise “preparation and preparation”
Week 17	Fitting workshop Pencil holder exercises finishing and assembling.
Week 18	Fitting workshop -The catcher exercise. - Clamping exercise. Written exam in practical exercises.
Week 19	Carpentry workshop -Occupational safety and its importance in carpentry workshops. - An introduction to carpentry, its types, types of wood, tools used, and preparation Preparing the tools used Face modification exercise using the reindeer
Week 20	Carpentry workshop Garden fence work and how to connect its parts, the eight-star exercise
Week 21	Carpentry workshop - Wood smoothing exercise using smoothing paper - Wood dyeing exercise in three stages Final smoothing and varnishing exercise Written exam in practical exercises
Week 22	The tinsmith workshop Occupational safety and its importance in plumbing workshops An introduction to plumbing, its tools, and plumbing stages Planning and marking exercise on metal plates
Week 23	The tinsmith workshop Geometric shapes Types of individuals and methods of individuals Geometric shape individuals exercise on a metal board
Week 24	The tinsmith workshop Cone members exercise - Exercise of cylinders with an oblique cut

	Roll forming operations Connection without the use of an intermediary Written exam in practical exercises
Week 25	Electric Workshop Occupational Safety and its importance in electrical workshops An introduction to the basics of electrical installations - Linking a simple circuit consisting of a lamp to the control of a single-way switch. Connect two lamps in series with one-way switch control. Connecting two lamps in parallel with the control of a single road switch. Connect two lights with one-way dual switch control.
Week 26	electric Workshop Connect a fluorescent lamp circuit to a one-way switch control Connecting an electric supply socket circuit to the control of a separate or combined one-way switch Written exam in practical exercises
Week 27	electric Workshop Occupational Safety and its importance in blacksmithing workshops Introduction to the basics of Blacksmithing - Barbell adjustment exercise Eight-star exercise - Exercise forming the number eight in English Exercise forming the number six in English
Week 28	supplementary training curriculum Welding workshop Plumbing workshop Blacksmith's workshop
Week 29	supplementary training curriculum - Automotive workshop - Turning workshop Fitting workshop
Week 30	supplementary training curriculum Carpentry workshop The plumbing workshop electric Workshop

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Workshop technology and measurements, Ahmed Salem Al-Sabbagh,	yes
Recommended Texts		

Websites		