
	Ministry of Higher Education and Scientific Research - Iraq University of Sumer College of Engineering Department of Mechanical Engineering	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
<b>Module Title</b>	<b>PHYSICS</b>		<b>Module Delivery</b>
<b>Module Type</b>	CORE		<b>Theory</b>  <b>Lecture</b>  <b>Lab</b>  <b>Tutorial</b>  <b>Practical</b>  <b>Seminar</b>
<b>Module Code</b>	<b>ER 103</b>		
<b>ECTS Credits</b>	4		
<b>SWL (hr/sem)</b>	<b>100</b>		
<b>Module Level</b>	UGI	<b>Semester of Delivery</b>	1
<b>Administering Department</b>	ME	<b>College</b>	ER
<b>Module Leader</b>	Dr. Masar Khadim	<b>e-mail</b>	
<b>Module Leader's Acad. Title</b>	Lecturer	<b>Module Leader's Qualification</b>	Lecturer
<b>Module Tutor</b>	Dr. Masar Khadim	<b>e-mail</b>	
<b>Peer Reviewer Name</b>	Dr. Ali Khaleel	<b>e-mail</b>	
<b>Review Committee Approval</b>	20/6/2023	<b>Version Number</b>	1.0

<b>Relation With Other Modules</b> العلاقة مع المواد الدراسية الأخرى			
<b>Prerequisite module</b>	None		<b>Semester</b>
<b>Co-requisites module</b>	None		<b>Semester</b>

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

#### Module Aims

#### أهداف المادة الدراسية

- 1. Core Concepts:** The aim of the physics module in engineering is to provide students with a solid understanding of core physics principles and concepts. This includes topics such as mechanics, electromagnetism, thermodynamics, and waves. The module aims to ensure that students develop a strong foundation in these fundamental principles, which are essential for various engineering disciplines.
- 2. Problem-Solving Skills:** An important objective of the physics module is to develop students' problem-solving skills. Physics often involves complex problems that require analytical thinking, mathematical modeling, and the ability to apply theoretical concepts to real-world situations. The module aims to enhance students' ability to analyze and solve engineering problems using physics-based approaches.
- 3. Applications in Engineering:** The physics module focuses on the application of physics principles in various engineering disciplines. Students will learn how to apply concepts such as forces, energy, electricity, and magnetism to analyze and design engineering systems and components. The aim is to enable students to understand the underlying physics behind engineering systems and to apply this knowledge in practical engineering applications.
- 4. Laboratory Skills:** The physics module aims to develop students' practical skills through laboratory work. Students will engage in hands-on experiments, data collection, and analysis to validate theoretical concepts and gain practical insights. The module aims to enhance students' ability to design and conduct experiments, analyze data, and draw meaningful conclusions, thereby fostering their experimental and investigative skills.
- 5. Interdisciplinary Connections:** The physics module aims to highlight the interdisciplinary nature of engineering. Students will explore how physics principles interact with other engineering disciplines, such as civil, electrical, and mechanical engineering. The module aims to cultivate an appreciation for the interconnectedness of different engineering fields and promote a holistic understanding of engineering systems.

	<p>6. <b>Critical Thinking and Problem Identification:</b> The physics module aims to develop students' critical thinking skills and their ability to identify and define engineering problems. Students will learn to evaluate and analyze complex engineering scenarios, identify relevant physics principles, and propose effective solutions. The module aims to foster students' ability to think critically and creatively, enabling them to tackle engineering challenges with innovative approaches.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Understand the fundamental principles of classical mechanics, including Newton's laws of motion, conservation of energy, and momentum.</li> <li>2. Apply mathematical tools, such as calculus and vector algebra, to solve problems related to motion, forces, and equilibrium in engineering systems.</li> <li>3. Demonstrate knowledge of the properties of materials, including elasticity, viscosity, and thermal conductivity, and their application in engineering design and analysis.</li> <li>4. Analyze and interpret experimental data using statistical methods and graphical representations, and draw conclusions based on the data.</li> <li>5. Explain the principles of electricity and magnetism, including Ohm's law, electromagnetic induction, and Maxwell's equations, and apply them to the analysis and design of electrical circuits.</li> <li>6. Understand the concepts of waves, optics, and sound, and their relevance to engineering applications, such as wave propagation, interference, and diffraction.</li> <li>7. Apply the laws of thermodynamics to analyze and optimize energy conversion processes in engineering systems, including heat engines and refrigeration systems.</li> <li>8. Demonstrate proficiency in using computational tools, such as simulations and numerical methods, to model and solve engineering problems related to physics.</li> <li>9. Understand the principles of quantum mechanics and their applications in engineering fields, such as quantum electronics, nanotechnology, and quantum computing.</li> <li>10. Apply the principles of fluid mechanics to analyze fluid flow and pressure in engineering systems, such as pipes, pumps, and turbines.</li> </ol>

	<p>11. Evaluate the environmental impact of engineering activities from a physics perspective, including the understanding of energy conservation, sustainability, and the mitigation of environmental hazards.</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Module ١: Classical Mechanics</p> <ul style="list-style-type: none"> <li>- Newton's laws of motion</li> <li>- Conservation of energy and momentum</li> <li>- Equilibrium and statics</li> <li>- Projectile motion and circular motion</li> <li>- Simple harmonic motion</li> </ul> <p>Module ٢: Mathematical Tools for Physics</p> <ul style="list-style-type: none"> <li>- Calculus: differentiation and integration</li> <li>- Vector algebra and vector calculus</li> <li>- Coordinate systems and transformations</li> <li>- Differential equations in physics</li> <li>- Fourier analysis and series</li> </ul> <p>Module ٣: Properties of Materials</p> <ul style="list-style-type: none"> <li>- Elasticity and Hooke's law</li> <li>- Stress, strain, and deformation</li> <li>- Fluid mechanics and viscosity</li> <li>- Thermal conductivity and heat transfer</li> <li>- Electrical properties of materials</li> </ul> <p>Module ٤: Experimental Methods and Data Analysis</p> <ul style="list-style-type: none"> <li>- Measurement techniques and instruments</li> <li>- Uncertainty analysis and error propagation</li> <li>- Statistical analysis of data</li> <li>- Graphical representation of data</li> <li>- Experimental design and control</li> </ul> <p>Module ٥: Electricity and Magnetism</p> <ul style="list-style-type: none"> <li>- Electric charge and electric fields</li> <li>- Gauss's law and electric potential</li> <li>- Electric current and circuits</li> <li>- Magnetic fields and forces</li> <li>- Electromagnetic induction</li> </ul> <p>Module ٦: Waves, Optics, and Sound</p> <ul style="list-style-type: none"> <li>- Wave properties: frequency, wavelength, amplitude</li> <li>- Wave propagation: reflection, refraction, diffraction</li> <li>- Interference and diffraction of light</li> <li>- Geometric optics: lenses and mirrors</li> <li>- Doppler effect and sound propagation</li> </ul> <p>Module ٧: Thermodynamics and Heat Transfer</p>

	<ul style="list-style-type: none"> <li>- Laws of thermodynamics</li> <li>- Heat and work in thermodynamic processes</li> <li>- Ideal gases and the gas laws</li> <li>- Heat engines and refrigeration systems</li> <li>- Heat transfer mechanisms: conduction, convection, radiation</li> </ul> <p>Module <math>\wedge</math>: Computational Physics</p> <ul style="list-style-type: none"> <li>- Numerical methods for solving physics problems</li> <li>- Simulation techniques and software tools</li> <li>- Modeling and analysis of complex systems</li> <li>- Data visualization and interpretation</li> <li>- Programming languages for scientific computing</li> </ul> <p>Module <math>\rho</math>: Quantum Mechanics and Quantum Electronics</p> <ul style="list-style-type: none"> <li>- Wave-particle duality</li> <li>- Schrödinger equation and wave functions</li> <li>- Quantum states and operators</li> <li>- Quantum tunneling and superposition</li> <li>- Applications in nanotechnology and quantum devices</li> </ul> <p>Module <math>\backslash \circ</math>: Fluid Mechanics</p> <ul style="list-style-type: none"> <li>- Fluid properties and behavior</li> <li>- Fluid statics and pressure measurement</li> <li>- Fluid dynamics and flow equations</li> <li>- Bernoulli's equation and its applications</li> <li>- Viscous flow and boundary layers</li> </ul> <p>Module <math>\backslash \backslash</math>: Environmental Physics</p> <ul style="list-style-type: none"> <li>- Energy conservation and sustainability</li> <li>- Environmental impacts of engineering activities</li> <li>- Pollution control and mitigation strategies</li> <li>- Hazard assessment and risk analysis</li> <li>- Renewable energy sources and technologies</li> </ul>
<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<ol style="list-style-type: none"> <li>1. Lectures: Engage students through interactive lectures where key concepts and principles are explained. Use visual aids, demonstrations, and real-life examples to enhance understanding.</li> <li>2. Problem-Solving Sessions: Conduct regular problem-solving sessions where students can practice applying physics principles to engineering problems. Provide guided exercises and encourage collaborative problem-solving among students.</li> </ol>

3. Laboratory Work: Incorporate laboratory experiments to provide hands-on experience and reinforce theoretical concepts. Allow students to collect and analyze data, draw conclusions, and relate their findings to real-world engineering applications.

4. Computational Simulations: Utilize computer simulations and modeling software to illustrate complex physical phenomena and engineering systems. Encourage students to use these tools to simulate and analyze various scenarios.

5. Group Projects: Assign group projects that require students to apply physics concepts to engineering design challenges. This promotes teamwork, problem-solving skills, and practical application of theoretical knowledge.

6. Case Studies: Present case studies showcasing the role of physics in engineering projects or technological advancements. Analyze the challenges faced, the physics principles involved, and the solutions implemented.

7. Guest Speakers: Invite industry professionals or researchers to give guest lectures, sharing their experiences of applying physics principles in engineering fields. This provides students with real-world perspectives and career insights.

8. Concept Mapping: Encourage students to create concept maps or mind maps to visually organize and connect physics principles, equations, and their applications in engineering. This helps reinforce understanding and identify relationships between different concepts.

9. Online Resources: Provide access to online resources, such as interactive simulations, virtual labs, video tutorials, and supplemental reading materials. This allows students to explore topics at their own pace and reinforce their understanding.

10. Problem-Based Learning: Present students with real-life engineering problems that require the application of physics principles. Facilitate discussions and guide students to analyze the problems, propose solutions, and evaluate their feasibility.

11. Assessment Methods: Use a variety of assessment methods, including quizzes, tests, assignments, and projects, to evaluate students'

	<p>understanding of physics in engineering. Provide constructive feedback to help students improve their knowledge and problem-solving skills.</p> <p>It is important to create a supportive and inclusive learning environment, where students feel comfortable asking questions, seeking clarification, and actively participating in class discussions. Regular feedback and communication with students can help identify areas of improvement and tailor teaching strategies to meet their learning needs.</p>
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Student Workload (SWL)			
الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

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

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Elementary mechanics with an emphasis on the fundamental concepts
Week 2	law of mechanic
Week 3	especially the conservation law
Week 4	Topics are scalar and vector quantities of mechanic rectilinear
Week 5	circular motion
Week 6	equilibrium and Newton's law of motion
Week 7	Mid-term Exam + work
Week 8	Energy1
Week 9	Momentum1
Week 10	the conservation law1
Week 11	Energy3
Week 12	Momentum2
Week 13	the conservation law2
Week 14	Energy3
Week 15	Preparatory Week
Week 16	Final Exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	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?
<b>Required Texts</b>		<b>No</b>
<b>Recommended Texts</b>		
<b>Websites</b>		

### APPENDIX:

#### GRADING SCHEME

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (٥٠ - ١٠٠)	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
<b>Fail Group</b> (٠ - ٤٩)	FX – Fail	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	F – Fail	راسب	(٠-٤٤)	Considerable amount of work required

Note:

NB Decimal places above or below ٠,٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). 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 DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
<b>Module Title</b>	<b>PRPERTIES OF MATERIALS</b>		<b>Module Delivery</b>
<b>Module Type</b>	CORE		Theory Lecture Lab Practical Seminar
<b>Module Code</b>	<b>ME105</b>		
<b>ECTS Credits</b>	6		
<b>SWL (hr/sem)</b>	<b>150</b>		
<b>Module Level</b>	UGx١١ ١	<b>Semester of Delivery</b>	
<b>Administering Department</b>	ME	<b>College</b>	ER
<b>Module Leader</b>	Dr. Mahmood Hassan	<b>e-mail</b>	
<b>Module Leader's Acad. Title</b>	Lecturer	<b>Module Leader's Qualification</b>	PhD
<b>Module Tutor</b>	Dr. Mahmood Hassan	<b>e-mail</b>	
<b>Peer Reviewer Name</b>	Dr. Ali Khaleel	<b>e-mail</b>	
<b>Review Committee Approval</b>	٢٥/٦/٢٠٢٣	<b>Version Number</b>	1.0

<b>Relation With Other Modules</b> العلاقة مع المواد الدراسية الأخرى			
<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	
<b>Module Aims, Learning Outcomes and Indicative Contents</b>			

## أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<p>١. To provide an understanding of the classification, properties, and testing methods of engineering materials.</p> <p>٢. To explore the properties of ferrous and non-ferrous metals.</p> <p>٣. To familiarize students with various mechanical tests and the principles of the material properties through application of different loads.</p> <p>٤. To introduce the principles and analysis of tensile test, hardness test, fatigue test, impact test, and creep test.</p>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>١. Classify engineering materials and describe their mechanical properties.</p> <p>٢. Conduct destructive and non-destructive tests on engineering materials.</p> <p>٣. Explain the principle of all mechanical loads and their effects on the mechanical tests.</p> <p>٤. Understand the principles and analysis of tension test results.</p> <p>٥. Understand the principles and analysis of impact test results</p> <p>٦. Understand the principles and analysis of fatigue test results.</p> <p>٧. Understand the principles and analysis of creep test results</p>
<b>Indicative Contents</b> المحتويات الإرشادية	Introduction/ physical properties, chemical properties, mechanical properties, Definitions of mechanical properties, mechanical load types, tension test results, impact test results, hardness test results, fatigue test results, creep test results

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time</p> <p>Refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students</p>
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل		<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل		<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل			

## Module Evaluation

### تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Engineering Materials: Classification of engineering materials
Week 2	Ferrous Metals
Week 3	Non-Ferrous Metals
Week 4	Engineering Materials: Destructive and non-destructive tests
Week 5	Physical properties of materials
Week 6	chemical properties of materials
Week 7	Mechanical load classification and definition
Week 8	Mechanical properties definition
Week 9	Tension test
Week 10	Hardness test

<b>Week 11</b>	Fatigue test
<b>Week 12</b>	Impact test
<b>Week 13</b>	Creep test
<b>Week 14</b>	Plastic Industry: Properties and classification of plastics
<b>Week 15</b>	Plastic Industry: thermal and mechanical Properties
<b>Week 16</b>	Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Lab ١: Hardness (Rockwell and Brinell) tests
<b>Week 2</b>	Lab ٢: Hardness (Vickers macro and micro hardness ) tests
<b>Week 3</b>	Lab ٣: tension test
<b>Week 4</b>	Lab ٤: tension test
<b>Week 5</b>	Lab ٥: impact test
<b>Week 6</b>	Lab ٦: fatigue test
<b>Week 7</b>	Lab ٦: fatigue test

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Introduction to Basic Manufacturing Processes and Workshop Technology Book by Rajender Singh <a href="https://blogpuneet.files.wordpress.com/٢٠١٣/٠٧/introduction-to-basic-manufacturing-processes-and-workshop-technology.pdf">https://blogpuneet.files.wordpress.com/٢٠١٣/٠٧/introduction-to-basic-manufacturing-processes-and-workshop-technology.pdf</a>	No

<b>Recommended Texts</b>		
<b>Websites</b>	<a href="https://www.aboutmech.com/">https://www.aboutmech.com/</a> <a href="https://faculty.uobasrah.edu.iq/faculty/en/1660/teaching">https://faculty.uobasrah.edu.iq/faculty/en/1660/teaching</a>	

**APPENDIX:**

<b>GRADING SCHEME</b>				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (٥٠ - ١٠٠)	<b>A - Excellent</b>	امتياز	٩٠ - ١٠٠	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	٨٠ - ٨٩	Above average with some errors
	<b>C - Good</b>	جيد	٧٠ - ٧٩	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	٥٠ - ٥٩	Work meets minimum criteria
<b>Fail Group</b> (٠ - ٤٩)	<b>FX – Fail</b>	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(٠-٤٤)	Considerable amount of work required
<b>Note:</b>				
<p>NB Decimal places above or below .,٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). 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.</p>				

## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>PRINCIPLES OF PRODUCTION PROCESSES</b>		Module Delivery
Module Type	CORE		Theory Lecture Lab Practical Seminar
Module Code	<b>ME303</b>		
ECTS Credits	7		
SWL (hr/sem)	<b>175</b>		
Module Level	UGx١١ ١	Semester of Delivery	ONE
Administering Department	ME	College	ER
Module Leader	Dr. Masar Khadim	e-mail	
Module Leader's	Lecturer	Module Leader's Qualification	PhD
Module Tutor	Dr. Masar Khadim	e-mail	
Peer Reviewer Name	Dr. Ali Khaleel	e-mail	
Review Committee Approval	٢٨/٦/٢٠٢٣	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

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>١. To provide an understanding of the classification, properties, and testing methods of engineering materials. ٢. To explore the production processes of ferrous and non-ferrous metals, plastics, ceramics, and powder metallurgy. ٣. To familiarize students with various casting techniques and the principles of the solidification process. ٤. To introduce the principles and analysis of cold and hot working processes, including rolling, extrusion, drawing, and welding technologies.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>١. Classify engineering materials and describe their mechanical properties. ٢. Conduct destructive and non-destructive tests on engineering materials. ٣. Explain the production processes of cast iron, steel, copper, aluminum, zinc, lead, tin, plastics, ceramics, and powder metallurgy. ٤. Understand the principles and analyze force requirements in hot rolling, hot extrusion, and hot drawing processes. ٥. Identify different welding processes and their applications. ٦. Describe the types and analyze the force requirements in various hot and cold working processes. ٧. Explain the principles and processes involved in various casting techniques</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Introduction, Definition / manufacturing systems, manufacturing processes, material selection, metal foundry, casting processes, metal removal processes, machining processes, sheet metal forming, metal deformation, joining processes, welding processes, and powder metallurgy</p>
<p style="text-align: center;"><b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>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 simple experiments involving some sampling activities that are interesting to the students</p>



<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل		<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل		<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل			

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Engineering Materials: Classification of engineering materials, Mechanical properties of material
Week 2	Engineering Materials: Destructive and non-destructive tests
Week 3	Ferrous Metal Production: Production of cast iron
Week 4	Ferrous Metal Production: Steel production
Week 5	Non-Ferrous Metal Production: Copper metal production
Week 6	Non-Ferrous Metal Production: Aluminum metal production
Week 7	Non-Ferrous Metal Production: Zinc, lead, and tin production
Week 8	Plastic Industry: Properties and classification of plastics
Week 9	Plastic Industry: Plastics production
Week 10	Ceramic Industry: Classification of ceramics, Ceramics production
Week 11	Cold and Hot Working: Principles of cold and hot working processes
Week 12	Hot Rolling: Principles of rolling processes, Rolling types, Force analysis in rolling
Week 13	Drawing Process: Types of hot drawing, Drawing analysis
Week 14	Hot Extrusion: Types of hot extrusion, Force analysis in extrusion
Week 15	Powder Metallurgy: Principles of powder metallurgy, Powder metallurgy production Casting: Casting types, Casting sandy process
Week 16	Final Exam

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab ١: workshop of sharper machine
Week 2	Lab ٢: workshop of drilling machine
Week 3	Lab ٣: workshop of lathe machine
Week 4	Lab ٤: workshop types of Files Tools
Week 5	Lab ٥: workshop of grinding machine
Week 6	Lab ٦: workshop of Milling
Week 7	Lab ٧: workshop of Carpentry
Week 8	Lab ٨: workshop of welding

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to materials science Jea P Mercier, Gerald Zambelli, Wilfried Kurz ٢٠٠٢ Edition	No
Recommended Texts	Materials science and engineering: an introduction William D.Callister Wiley ٢٠١٨	
Websites	<a href="https://www.aboutmech.com/">https://www.aboutmech.com/</a> <a href="https://faculty.uobasrah.edu.iq/faculty/en/١٦٦٠/teaching">https://faculty.uobasrah.edu.iq/faculty/en/١٦٦٠/teaching</a>	

APPENDIX:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (٥٠ - ١٠٠)	A - Excellent	امتياز	٩٠ - ١٠٠	Outstanding Performance
	B - Very Good	جيد جدا	٨٠ - ٨٩	Above average with some errors
	C - Good	جيد	٧٠ - ٧٩	Sound work with notable errors
	D - Satisfactory	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	E - Sufficient	مقبول	٥٠ - ٥٩	Work meets minimum criteria
Fail Group (٠ - ٤٩)	FX – Fail	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	F – Fail	راسب	(٠-٤٤)	Considerable amount of work required
Note:				
<p>NB Decimal places above or below .٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). 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.</p>				

## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	ENGINEERING DRAWING +DESCRIPTIVE ENGINEERING		Module Delivery
Module Type	CORE		Theory Lecture Lab Tutorial Practical Seminar
Module Code	ER 104		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGI	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Hussein Riyadh		e-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PhD
Module Tutor	Dr. Hussein Riyadh		e-mail
Peer Reviewer Name	Dr. Mahmood Hassan		e-mail
Review Committee Approval	٢٠/٧/٢٠٢٣	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

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p><b>Provide students with:</b></p> <ol style="list-style-type: none"> <li>١. An understanding of the definition, necessary background and importance of the subject of Mechanical Eng. Drawing, apply the basic terminology, concepts, principles and theories of it in order to:</li> <li>٢. Be able to draw mechanical elements,</li> <li>٣. Be able to apply geometrical and dimensional tolerances,</li> <li>٤. Practice assembly drawings,</li> </ol> <p>Be able to use drawing software packages for drawing both mechanical elements and assembly drawings.</p> <ol style="list-style-type: none"> <li>٦. Skills of hand drawing of sketches.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>١. Apply knowledge of mathematics, science, and engineering</li> <li>٢. Design a system, component, or process to meet desired needs</li> <li>٣. Use the techniques, skills, and modern engineering tools necessary for engineering practice</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<ol style="list-style-type: none"> <li>١-Semi-straight line</li> <li>٢- Divide the line into a number of equal parts</li> <li>٣- Draw a straight line parallel to another line</li> <li>٤- Draw a straight line parallel to another straight line using the triangle and the letter T ruler</li> <li>٥- Divide the angle</li> <li>٦- Divide an angle into a number of equal parts</li> <li>٧- Draw a regular triangle given the sides</li> <li>٨- Draw an arc touching two straight lines</li> <li>٩- Draw an arc touching another arc and a straight line</li> <li>١٠- Draw an arc that touches two other arcs</li> <li>١١ - Draw a regular pentagon</li> <li>١٢ - Draw a regular hexagon</li> <li>١٣- Divide the circle into seven equal parts</li> <li>١٤- Divide the circle into eight equal parts</li> <li>١٥- Draw an ellipse using the four-center method</li> <li>١٦-Truncated projections, reproduction of an unknown projection of</li> <li>١٧- known projection (the third projection), dimensioning on the projections,</li> </ol>

	١٨- Free drawing, stereoscopic drawing, reproduction of figures from projections, cutting in figures, dimensions in figures
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<ul style="list-style-type: none"> <li>• Skills of using a drafting package. Geometrical and dimensional tolerances. Applications on mechanical elements (bolted, welded and riveted joints, shafts and keys, springs, gears). Applications on assembly and working drawings (valves, presses etc.)</li> <li>• Descriptive geometry and methods of projection, Projection of point, Projection of</li> <li>• Straight line, Projection plane surface, auxiliary planes, Development, Application.</li> </ul>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	108	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As		<b>Time/ Number</b>	<b>Weight (Marks)</b>	<b>Week Due</b>	<b>Relevant Learning Outcome</b>
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignment s</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	20% (10)	Continuous	
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10

<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	2hr	40% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Introduction to drawing,
<b>Week 2</b>	engineering drawing / line tools and types of lines,
<b>Week 3</b>	line tools and types of lines +Descriptive geometry
<b>Week 4</b>	engineering operations
<b>Week 5</b>	engineering operations + methods of projection
<b>Week 6</b>	engineering operations +Projection of point
<b>Week 7</b>	Mid-term Exam+, Projection of straight line,
<b>Week 8</b>	projections
<b>Week 9</b>	projections + Projection plane surface
<b>Week 10</b>	Truncated projections
<b>Week 11</b>	reproduction of an unknown projection of a known projection (the third projection)
<b>Week 12</b>	dimensioning on the projections
<b>Week 13</b>	Free drawing, stereoscopic drawing+ Auxiliary planes, Development, Application
<b>Week 14</b>	reproduction of figures from projections, cutting in figures, dimensions in figures
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>



## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Textbooks and References • "Engineering Design Graphics", James H. Earle, AutoCAD ٢٠٠٤, Pearson Education Inc.	Yes
<b>Recommended Texts</b>	• "Engineering Drawing" with a primer on AutoCAD, Archad Noor etc. Prentice-Hall ٢٠٠٠	No
<b>Websites</b>		

#### APPENDIX:

### GRADING SCHEME

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (٥٠ - ١٠٠)	<b>A</b> - Excellent	امتياز	٩٠ - ١٠٠	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	٨٠ - ٨٩	Above average with some errors
	<b>C</b> - Good	جيد	٧٠ - ٧٩	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	٥٠ - ٥٩	Work meets minimum criteria
<b>Fail Group</b> (٠ - ٤٩)	<b>FX</b> – Fail	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(٠-٤٤)	Considerable amount of work required

#### Note:

NB Decimal places above or below .٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). 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 DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	MATHEMATICS		Module Delivery
Module Type	CORE		Theory Lecture Tutorial Seminar
Module Code	ER 101		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UG I	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Athraa Hameed	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PhD
Module Tutor	Dr. Athraa Hameed	e-mail	
Peer Reviewer Name	Dr. Ali Khaleel	e-mail	
Review Committee Approval	٥/٧/٢٠٢٣	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

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. To develop problem solving skills and understanding of mathematics theory through the application of techniques.</li><li>2. To understand how function and its draw.</li><li>3. This course deals with the basic concept of functions and its behavior.</li><li>4. This is the basic subject for all mathematics and calculus subject.</li><li>5. To understand the derivative and integral problems.</li><li>6. To perform methods of integration analysis.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Recognize how function works and its slope.</li><li>2. Discuss the various problems about the real numbers and equations of lines and inequalities.</li><li>3. Summarize what is meant by a basic Algebra.</li><li>4. Discuss the analysis of graphs of functions.</li><li>5. Describe the inverse, exponential and logarithmic functions.</li><li>6. Define the systems of matrices.</li><li>7. Identify the basic derivatives and their applications.</li><li>8. Discuss the operations of integral and numeric integral.</li><li>9. Discuss the various problems of integral and its application.</li><li>10. Explain the methods of integration.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>None</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something Like the main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	123	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	8.2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

## Module Evaluation

### تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7

<b>assessment</b>	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Introduction – algebraic functions and its inverse.
<b>Week 2</b>	Linear functions, Equations and inequalities
<b>Week 3</b>	Limits and continuity
<b>Week 4</b>	Derivative and it's applications
<b>Week 5</b>	Hyperbolic functions
<b>Week 6</b>	Introduction to Integral
<b>Week 7</b>	Applications of integration.
<b>Week 8</b>	Introduction to methods of integration
<b>Week 9</b>	Methods of integration
<b>Week 10</b>	Methods of integration
<b>Week 11</b>	Methods of integration
<b>Week 12</b>	Matrices and determinants
<b>Week 13</b>	Numerical method to solve non-linear algebraic equations
<b>Week 14</b>	Trapezoidal and Simpsons rule
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	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?
<b>Required Texts</b>	Thomas, G.B., Finney, R.L., Weir, M.D. and Giordano, F.R., ٢٠٠٢. <i>Thomas' calculus</i> . Reading: Addison-Wesley.	Yes
<b>Recommended Texts</b>	Hornsby, J., Lial, M.L. and Rockswold, G.K., ٢٠١١. <i>A Graphical Approach to Algebra and Trigonometry</i> . Addison Wesley.	No
<b>Websites</b>		

APPENDIX:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (٥٠ - ١٠٠)	A - Excellent	امتياز	٩٠ - ١٠٠	Outstanding Performance
	B - Very Good	جيد جدا	٨٠ - ٨٩	Above average with some errors
	C - Good	جيد	٧٠ - ٧٩	Sound work with notable errors
	D - Satisfactory	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	E - Sufficient	مقبول	٥٠ - ٥٩	Work meets minimum criteria
Fail Group (٠ - ٤٩)	FX – Fail	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	F – Fail	راسب	(٠-٤٤)	Considerable amount of work required
Note:				
<p>NB Decimal places above or below .٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). 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.</p>				

## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	ENGINEERING MECHANICS (DYNAMICS)		Module Delivery
Module Type	CORE		Theory Lecture Lab Tutorial Practical Seminar
Module Code	ME103		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	
Administering Department		College	
Module Leader	Dr. Ali Kaleel	e-mail	
Module Leader's Acad. Title	Lecturer		PhD
Module Tutor	Dr. Ali Kaleel	e-mail	
Peer Reviewer Name	Dr. Athra Hameed	e-mail	
Review Committee Approval	11/06/2023	Version Number	1.0

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ER101 ER103 ME103		Semester
Co-requisites module	None		Semester



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>The main objectives of the course are to:</p> <ol style="list-style-type: none"> <li>1. The application of analytical techniques to the solution of important engineering dynamics problems. It aims to develop the student understanding and their ability to solve advanced dynamics problems related to machine dynamics and vibration.</li> <li>2. The deformation and failure of statically loaded engineering materials and structures and the analytical procedures that can be utilized to preclude such failures. This part aims to enhance the student understanding of the deformation and failure of statically loaded engineering materials and structures and the analytical procedures that can be utilized to preclude such failures.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>On successfully completing the module students will have knowledge and understanding of:</p> <ol style="list-style-type: none"> <li>1. kinematics and kinetics of rigid bodies</li> <li>2. dynamic equations of motion for rigid bodies in 2D and 3D</li> <li>3. analysis of dynamic forces of mechanisms</li> <li>4. work and energy</li> <li>5. vibration theory with its applications to engineering problems</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ul style="list-style-type: none"> <li>- <u>kinematics and kinetics of particles;</u></li> <li>- <u>dynamic equations of motion for rigid bodies in two dimensions;</u></li> <li>- <u>equations of motion for rigid bodies in three dimensions;</u></li> <li>- <u>response of linear systems to general loading, damping, force transmission;</u></li> <li>- <u>two degree of freedom systems: Gears (Spur, Helical, Bevel and Worm Gears);</u></li> <li>- <u>Vibration of discrete and continuous systems, Vibration of continuous systems;</u></li> </ul>
<p><b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>Lectures, in-class examples and exercises Homework, exams, final exam.</p>

Student Workload (SWL)			
الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	93	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation					
تقييم المادة الدراسية					
As		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)		
	Homework	5	10% (10)		
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2 hr	20% (10)		
	Final Exam	2hr	60% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction
Week 2	Dynamics of Particles
Week 3	Dynamics of Particles

<b>Week 4</b>	Work and energy of Particles
<b>Week 5</b>	Work and energy of Particles
<b>Week 6</b>	2D Dynamics of Particles
<b>Week 7</b>	2D Dynamics of Particles
<b>Week 8</b>	2D Work and energy of Particles
<b>Week 9</b>	2D Work and energy of Particles
<b>Week 10</b>	Dynamics of Rigid Bodies
<b>Week 11</b>	Dynamics of Rigid Bodies
<b>Week 12</b>	Work and energy of Rigid Bodies
<b>Week 13</b>	Work and energy of Rigid Bodies
<b>Week 14</b>	2D Dynamics of Rigid Bodies
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

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

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Kinematics, Dynamics, and Design of Machinery; Kenneth J. Waldron, Gary L. Kinzel, Sunil K. Agrawal, Wiley, 2016  Kinematics and Dynamics of Machinery; Robert L. Norton, McGraw Hill, 2009	Yes
<b>Recommended Texts</b>		No
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering</a>	

**APPENDIX:**

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (٥٠ - ١٠٠)	<b>A – Excellent</b>	امتياز	٩٠ - ١٠٠	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	٨٠ - ٨٩	Above average with some errors
	<b>C – Good</b>	جيد	٧٠ - ٧٩	Sound work with notable errors
	<b>D – Satisfactory</b>	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	<b>E – Sufficient</b>	مقبول	٥٠ - ٥٩	Work meets minimum criteria
<b>Fail Group</b> (٠ - ٤٩)	<b>FX – Fail</b>	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(٠-٤٤)	Considerable amount of work required
<b>Note:</b>				
NB Decimal places above or below ٠,٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). 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 DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	ENGINEERING MECHANICS I - STATIC I		Module Delivery
Module Type	CORE		Theory Lecture Lab Tutorial Practical Seminar
Module Code	ME103		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	
Administering Department		College	
Module Leader	Dr. Thamer Hassan	e-mail	
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	PhD
Module Tutor	Dr. Thamer Hassan	e-mail	
Peer Reviewer Name	Dr. Hussein Riyadh	e-mail	
Review Committee Approval	١/٦/٢٠٢٣	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

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>The main objectives of the course are to:</p> <ol style="list-style-type: none"><li>1. Provide a thorough understanding of the principles governing the forces applied on objects in equilibrium.</li><li>2. Provide the necessary tools and mathematical background for the analysis of objects in equilibrium.</li><li>3. Develop problem-solving skills for a wide variety of practical engineering problems that involve objects at rest.</li><li>4. Introduce techniques and methodologies for the effective analysis of objects and structures at rest.</li><li>5. Introduce the concepts of supports and loads that are acting on a structural system under equilibrium conditions.</li><li>6. Develop the ability to determine internal and external forces and bending moments of structures and machines.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>After completion of the course students are expected to:</p> <ol style="list-style-type: none"><li>1. Use free-body diagrams and apply vector analysis to solve equilibrium problems for particles or rigid bodies in two- and three-dimensional space.</li><li>2. Use techniques to determine the forces acted on members of trusses and machines in equilibrium.</li><li>3. Determine whether an object is statically indeterminate.</li><li>4. Use integration and geometrical computations to calculate centroids of lines, areas, and volumes.</li><li>5. Calculate internal forces and bending moment of members in equilibrium.</li><li>6. Determine the moment of inertial of areas by integration and parallel-axis theorem.</li><li>7. Solve problems involving non-uniform loads and friction.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Overview of vectors</u></p> <p><u>Free-body diagrams</u></p> <p><u>System of forces and moments</u></p> <p><u>Objects in equilibrium (2-D and 3-D problems)</u></p> <p><u>Structures in equilibrium including trusses, frames and machines</u></p>

	<u>Centroids and centers of mass</u> <u>Moments of inertial including parallel-axis theorem</u> <u>Distributed forces and loads including internal forces (shear force, axial force, and bending moment)</u> <u>Friction</u> <u>Virtual work and potential energy</u>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Lectures, in-class examples and exercises Homework, exams, final exam.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)		
	<b>Homeworks</b>	5	10% (10)		
	<b>Projects / Lab.</b>				
	<b>Report</b>				
<b>Summative</b>	<b>Midterm Exam</b>	2 hr	20% (10)		

<b>assessment</b>	<b>Final Exam</b>	2hr	60% (50)		All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Introduction (Chapter ١ in Textbook)
<b>Week 2</b>	Statics of Particles (Chapter ٢)
<b>Week 3</b>	Statics of Particles (Chapter ٢)
<b>Week 4</b>	Rigid Bodies: Equivalent System of Forces (Chapter ٣)
<b>Week 5</b>	Rigid Bodies: Equivalent System of Forces (Chapter ٣)
<b>Week 6</b>	Equilibrium of Rigid Bodies (Chapter ٤)
<b>Week 7</b>	Equilibrium of Rigid Bodies (Chapter ٤)
<b>Week 8</b>	Analysis of Trusses (Chapter ٦)
<b>Week 9</b>	Analysis of Trusses (Chapter ٦)
<b>Week 10</b>	Analysis of Beams (Chapter ٧)
<b>Week 11</b>	Analysis of Beams (Chapter ٧)
<b>Week 12</b>	Friction (Chapter ٨)
<b>Week 13</b>	Geometric Properties of Surfaces (Chapter ١٠ and Chapter ٩)
<b>Week 14</b>	Geometric Properties of Surfaces (Chapter ١٠ and Chapter ٩)
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>



## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	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?
<b>Required Texts</b>	1. Engineering Mechanics-Statics, 3rd SI Ed., Hibbeler, R. C., Prentice Hall, 2005. 2. Engineering Statics, 3rd SI Ed., Meriam J. L., Kraige L. G., John Wiley, 2003.	Yes
<b>Recommended Texts</b>	Vector Mechanics for Engineers-Statics, 7th SI Ed., Beer F. P., Johnston E. R. and Eisenberg E. R., McGraw-Hill, 2004.	No
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering</a>	

APPENDIX:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (٥٠ - ١٠٠)	A – Excellent	امتياز	٩٠ - ١٠٠	Outstanding Performance
	B - Very Good	جيد جدا	٨٠ - ٨٩	Above average with some errors
	C – Good	جيد	٧٠ - ٧٩	Sound work with notable errors
	D – Satisfactory	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	E – Sufficient	مقبول	٥٠ - ٥٩	Work meets minimum criteria
Fail Group (٠ - ٤٩)	FX – Fail	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	F – Fail	راسب	(٠-٤٤)	Considerable amount of work required
Note:				
<p>NB Decimal places above or below .,٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). 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.</p>				

## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	BASICS OF ENGLISH LANGUAGE		Module Delivery
Module Type	SUPPLEMENT		Theory Lecture Tutorial Seminar
Module Code	UR 102		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGI	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Review Committee Approval		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

<b>Module Aims</b> أهداف المادة الدراسية	1. To develop students' English language skills 2. To strengthen speaking and listening in English 3. Facilitate the learning of engineering specialization by mastering the English language to accept many educational resources related to engineering.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	1. Develops speaking and discussion skills in English 2. The ability to form complete sentences in different tenses and to suit the dialogue time 3. Writing formal and informal letters 4. Mastering English grammar with the correct spelling of words
<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following.  <u>Parts of speech (nouns, pronouns, verbs, adverbs, prepositions, conjunctions, with learning the structure of the sentences, quiz</u> <u>4 hour</u>  <u>interjections); kinds of sentences (simple, compound, complex); subordinate clauses;</u> <u>4 hour</u>  <u>change of sentences from simple to compound and vice versa; tenses; ; direct and indirect speech.</u> <u>4 hour</u>  <u>Modal verbs</u> <u>2 hour</u>  <u>prefixes and suffixes</u> <u>2 hour</u>

	<u>Politely request</u> <u>2 hour</u>  <u>Conjunctions</u> <u>2 hour</u>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	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 simple experiments involving some sampling activities that are interesting to the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	50		

<b>Module Evaluation</b> تقييم المادة الدراسية					
<b>As</b>		<b>Time/Number</b>	<b>Weight (Marks)</b>	<b>Week Due</b>	<b>Relevant Learning Outcome</b>
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	none			

	<b>Report</b>	1	5% (5)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	20% (20)	7	LO # 1-7
	<b>Final Exam</b>	3hr	60% (60)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Parts of speech (nouns, pronouns, verbs, adverbs, prepositions L1
<b>Week 2</b>	Parts of speech (nouns, pronouns, verbs, adverbs, prepositions L2
<b>Week 3</b>	Interjections l1
<b>Week 4</b>	Interjections L2
<b>Week 5</b>	Change of sentences from simple to compound and vice versa; tenses; ; direct and indirect speech. L1
<b>Week 6</b>	Change of sentences from simple to compound and vice versa; tenses; ; direct and indirect speech. L2
<b>Week 7</b>	Verbs
<b>Week 8</b>	Mid-term Exam
<b>Week 9</b>	Writing the essay or article l1
<b>Week 10</b>	Writing the essay or article l1
<b>Week 11</b>	Modal verbs
<b>Week 12</b>	prefixes and suffixes
<b>Week 13</b>	Politely request
<b>Week 14</b>	Conjunctions
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	English Grammar, Raymond murfy, 1985	No
<b>Recommended Texts</b>	English structure , 2020	No
<b>Websites</b>	<a href="https://www.examveda.com/competitive-english/practice-mcq-question-on-grammar/">https://www.examveda.com/competitive-english/practice-mcq-question-on-grammar/</a>	

#### APPENDIX:

### GRADING SCHEME

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (٥٠ - ١٠٠)	<b>A - Excellent</b>	امتياز	٩٠ - ١٠٠	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	٨٠ - ٨٩	Above average with some errors
	<b>C - Good</b>	جيد	٧٠ - ٧٩	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	٥٠ - ٥٩	Work meets minimum criteria
<b>Fail Group</b> (٠ - ٤٩)	<b>FX – Fail</b>	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(٠-٤٤)	Considerable amount of work required

Note:

NB Decimal places above or below .٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	ARABIC LANGUAGE		Module Delivery
Module Type	CORE		Theory
Module Code	UR 101		Lecture
ECTS Credits	2		Lab
SWL (hr/sem)	50		Tutorial
			Practical
			Seminar
Module Level	UGI	Semester of Delivery	١
Administering Department	Type Dept. Code	College	Type College Code
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	١,٠

### Relation with other Modules

#### العلاقة مع المواد الدراسية الأخرى

نرى ان اللغة العربية هي لغة ببنية ومتداخلة وذات صلة بجميع العلوم الاخرى لا سيما وانها اكتسبت قداستها لارتباطها الوثيق بالقرآن الكريم, وقال ابن كثير معللاً اختيار العربية لغة للقرآن الكريم: «وذلك لأن لغة العرب أفصح اللغات وأبينها وأوسعها، وأكثرها تأدية للمعاني التي تقوم بالنفوس؛ فلهذا أنزل أشرف الكتب بأشرف اللغات»[٤]. كما أن «اختيار الله للعربية، أو اللسان العربي، ليكون أداة التوصيل، ووسيلة الإبانة، ووعاء التفكير لها.



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<p>١. التعرف على مواطن الجمال في اللغة العربية وآدابها، وأن يكتسب الطالب القدرة على دراسة فروع اللغة العربية.</p> <p>٢. تنمية الذوق الأدبي لدى الطالب حتى يدرك النواحي الجمالية في أساليب الكلام</p> <p>٣. تمكين الطالب من القراءة الصحيحة، وأن يكتسب القدرة على استعمال اللغة استعمالاً صحيحاً في الاتصال مع الآخرين؛ كالسرعة وجودة الإلقاء وحسن التعبير.</p> <p>٤. تعويد الطالب التعبيرات السليمة الواضحة عن أفكاره وما يقع تحت حواسه نطقاً وكتابة وحسن استخدام علامات الترقيم</p> <p>٥. تنمية قدرة ومهارة الطالب الإملائية والخطية بحيث يستطيع الكتابة الصحيحة من جميع النواحي.</p> <p>٦. تعويد الطلاب على قواعد الحديث واحترام الرأي الآخر وكذلك التغلب على عامل الخجل.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>الاهداف المعرفية</p> <p>١. تذكر المعلومات التي درسها واستدعاؤها عند الحاجة</p> <p>٢. فهم المعلومات والشروح التي تفسر بعض الظواهر اللغوية والأدبية</p> <p>٣. تطبيق جميع ما تعلمه ودرسه الطلبة في حياتهم العملية</p> <p>٤. تحليل المشكلة او الموضوع الذي يتألف من اجزاء مختلفة ودراستها</p> <p>٥. تركيب اجزاء الجملة لمعرفة معنى كل جزء على حدة مع الاطلاع على المفاهيم الأدبية والأغراض الشعرية</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>اللغة العربية أو لغة الضاد هي واحدة من أكثر اللغات انتشاراً ضمن مجموعة اللغات السامية، في دول الوطن العربي إضافة للعديد من المناطق الأخرى مثل تركيا، والأحواز، ومالي وتشاد، والسنغال، وإثيوبيا، وأريتيريا، وإيران، وجنوبي السودان. اللغة العربية تعتبر لغة مقدسة على اعتبار أنها لغة القرآن، حيث لا تتم الصلاة والعبادات الأخرى في الدين الإسلامي إلا بإتقان اللغة العربية، كما أنها لغة شعائرية لدى عددٍ من الكنائس المسيحية على امتداد الوطن العربي، وقد تمت كتابة العديد من الأعمال الفكرية والدينية اليهودية بها وتحديداً في العصور الوسطى. كان لانتشار الدين الإسلامي تأثيراً مباشراً وغير مباشر في رفع شأن ومكانة اللغة العربية، حيث أصبحت لغة العلم والأدب والسياسة لأزمنة طويلة في الديار التي حكمها المسلمون، بالإضافة لهذا فقد كان للغة العربية تأثير كبير على عددٍ من اللغات الأخرى على امتداد العالم الإسلامي.</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>١. إثارة أسئلة متنوعة يمكن غيرها استدعاء المعلومات</p> <p>٢. شرح موضوع ما عبر مصادر متنوعة ومحاولة ربط المصادر بعضها ببعض</p> <p>٣. مشاهدة بعض البرامج والندوات العلمية والمؤتمرات العلمية والتربوية</p>
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	٦٠	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	٤
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	٤٠	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	٢
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	١٠٠		

## Module Evaluation

### تقييم المادة الدراسية

As		Time /Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	٢	١٠٪ (١٠)	٥ and ١٠	LO #١, #٢ and #١٠, #١١
	<b>Assignments</b>	٢	١٠٪ (١٠)	٢ and ١٢	LO #٣, #٤ and #٦, #٧
	<b>Projects / Lab.</b>	١	١٠٪ (١٠)	Continuous	All
	<b>Report</b>	١	١٠٪ (١٠)	١٣	LO #٥, #٨ and #١٠
<b>Summative</b>	<b>Midterm Exam</b>	٢hr	١٠٪ (١٠)	٧	LO #١ - #٧

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

١. شرح ابن عقيل
٢. معجم اللغة العربية
٣. شذا العرف في فن الصرف
٤. كتب الادب والشعر

## Appendix:

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
<p><b>Note:</b> 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.</p>				

## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	PRINCIPLES OF COMPUTER SCIENCE		Module Delivery
Module Type	CORE		Theory Lecture Lab Tutorial Practical Seminar
Module Code	ER 102		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGI	Semester of Delivery	
Administering Department	ME	College	ER
Module Leader	Dr. Hussein Riyadh		e-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PhD
Module Tutor	Dr. Hussein Riyadh		e-mail
Peer Reviewer Name	Dr. Ali Khaleel	e-mail	
Review Committee Approval	٦/٦/٢٠٢٣	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

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>The theoretical foundations of computer engineering have expanded substantially in recent years. The objective of this course is to introduce students to this fundamental area of computer science, which enables students to focus on the study of programming languages. These languages allow the students to assess what could be achieved through computing when they are using it to solve problems in science and engineering. The course exposes students to the programming with C++, as well as to its usage for problem solving. The course introduces basic programming instructions and their properties, and the necessary mathematical libraries to develop different software applications. Upon completion of this course, the students are expected to become proficient in key topics of C++ programming, and to have the opportunity to explore the current topics in this area.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Clarify the basic concepts of programming in C++ through a set of programming instructions.</li> <li>2. Gain skills in handling programming problems and issues.</li> <li>3. Acquiring basic skills as an introduction to building large and applied programs.</li> <li>4. Gain a basic understanding of how programmed systems work in various industrial applications.</li> <li>5. Ability to program and design application programs.</li> <li>6. The ability to think about addressing a particular problem or issue.</li> <li>7. Writing scientific reports.</li> <li>8. The ability to gain experience in dealing with programmed systems.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<ol style="list-style-type: none"> <li>١. Readings, self-learning, panel discussions.</li> <li>٢. Exercises and activities in the lecture.</li> <li>٣. Homework.</li> <li>٤. Directing students to some websites to benefit and develop capabilities.</li> <li>٥. Conducting seminars to explain and analyze a specific issue and find solutions to it.</li> </ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>١. Explanation and clarification through lectures.</p> <p>٢. The method of displaying scientific materials on display devices: data show, smart boards, and plasma screens.</p> <p>٣. Self-learning through homework and mini-projects within the lectures.</p> <p>٤. Laboratories.</p> <p>٥. Graduation projects.</p> <p>٦. Scientific visits.</p> <p>٧. Seminars held in the department.</p>
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	64	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## Module Evaluation

### تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2,
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7

	<b>Projects / Lab.</b>	1	10% (10)	Continuo us	
	<b>Report</b>	1	10% (10)	13	LO # 5, 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Introduction to computer fundamentals
<b>Week 2</b>	Introduction-Algorithms-Example of Algorithms
<b>Week 3</b>	Flowcharts-Symbols and Idiomatic Forms in Flowcharts- Types of Flowcharts
<b>Week 4</b>	Completing the topic of Flowcharts type-Example of Flowcharts
<b>Week 5</b>	Basics of programming in C++ language program parts- language components (language codes, special words, variables)
<b>Week 6</b>	Office functions, types of variables, logical expressions
<b>Week 7</b>	Arithmetic tools- priority of arithmetic and logical operations- illustrative examples
<b>Week 8</b>	Input and output order- Directing characters- Formatted console for input and output operations
<b>Week 9</b>	Completing the Formatted console for input and output operations- illustrative examples
<b>Week 10</b>	Conditional Statements (if statement- if-else statement-if-else-if statement-Compound if)
<b>Week 11</b>	Loop Statements (for-statement, while-statement- do-while statement-illustrative examples)
<b>Week 12</b>	Loop Statements

	(Nested Loop Statements- illustrative examples)
<b>Week 13</b>	One-Dimensional Arrays-illustrative examples
<b>Week 14</b>	Two- Dimensional Arrays- Operations on Arrays
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
Week	Material Covered
<b>Week 1</b>	Lab 1: Steps to create, compile and implement a program using Microsoft visual C++ 6.0
<b>Week 2</b>	Lab 2: Implement programs for conditional statements (if-statement)
<b>Week 3</b>	Lab 3: Implement programs for conditional statements (switch-statement)
<b>Week 4</b>	Lab 4: Implement programs for Loop statements (for-statement)
<b>Week 5</b>	Lab 5: Implement programs for conditional statements (while-statement, do-while-statement)
<b>Week 6</b>	Lab 6: Implement programs for Array (one dimension)
<b>Week 7</b>	Lab 7: Implement programs for Array (two-dimension)

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>		
<b>Recommended Texts</b>		No



APPENDIX:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (٥٠ - ١٠٠)	A - Excellent	امتياز	٩٠ - ١٠٠	Outstanding Performance
	B - Very Good	جيد جدا	٨٠ - ٨٩	Above average with some errors
	C - Good	جيد	٧٠ - ٧٩	Sound work with notable errors
	D - Satisfactory	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	E - Sufficient	مقبول	٥٠ - ٥٩	Work meets minimum criteria
Fail Group (٠ - ٤٩)	FX – Fail	مقبول بقرار	(٤٥-٤٩)	More work required but credit awarded
	F – Fail	راسب	(٠-٤٤)	Considerable amount of work required
Note:				
<p>NB Decimal places above or below ٠,٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤). 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.</p>				

	Ministry of Higher Education and Scientific Research - Iraq University of Sumer College of Engineering Department of Mechanical Engineering	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
Module Title	<b>APPLIED MATHEMATICS</b>		Module Delivery
Module Type	BASIC		<div style="background-color: red; color: black; padding: 2px; display: inline-block;">Theory</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Lecture</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Tutorial</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Seminar</div> Lab
Module Code	ER201		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGII	Semester of Delivery	
Administering Department	ME	College	Engineering
Module Leader	Hussein R. Taresh	e-mail	
Module Leader's Acad. Title	Lecturer		
Module Tutor	Hussein R. Taresh	e-mail	
Peer Reviewer Name	Dr. Ali Khaleel	e-mail	
Review Committee Approval	12/06/2023	Version Number	1.0

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	Calculus	<b>Semester</b>	1
<b>Co-requisites module</b>	None	<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To develop problem solving skills and understanding of mathematics theory through the application of techniques.</li><li>2. To understand how function of several variables.</li><li>3. This course deals with the basic concept of multivariable functions and its behavior.</li><li>4. This is the basic subject for partial derivatives and its applications.</li><li>5. To understand the derivative and integral problems.</li><li>6. To perform ordinary differential equations.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Recognize how function of several variable works .</li><li>2. Discuss the various problems about the real numbers and equations of lines and inequalities.</li><li>3. Summarize what is meant by a basic Algebra.</li><li>4. Discuss the analysis of graphs of functions.</li><li>5. Describe the series and its applications.</li><li>6. Define the ordinary differential equations.</li><li>7. Identify the basic of complex numbers.</li><li>8. Discuss the operations of integral and numeric integral.</li><li>9. Discuss the various problems of numerical solutions of O.D.E.</li><li>10. Explain the methods of Euler and Range Cuta.</li></ol>

<b>Indicative Contents</b> المحتويات الإرشادية	None
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	52	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	123	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

<b>Module Evaluation</b> تقييم المادة الدراسية				
<b>As</b>	<b>Time/Number</b>	<b>Weight (Marks)</b>	<b>Week Due</b>	<b>Relevant Learning Outcome</b>
	<b>Quizzes</b>	2	10% (10)	5, 10
				LO #1, 2, 10 and 11

Formative assessment	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction – functions of several variables.
Week 2	Limits partial derivatives
Week 3	Limits and continuity
Week 4	Directional Derivative
Week 5	Tangent plane and normal line extra
Week 6	Lagrange multipliers
Week 7	Double and triple integrals
Week 8	Double and triple integrals and its applications
Week 9	Complex numbers
Week 10	Series solutions and power series

<b>Week 11</b>	Ordinary differential equations
<b>Week 12</b>	Linear systems of differential equations
<b>Week 13</b>	Numerical method to solve O.D.E equations
<b>Week 14</b>	Euler and Range cuta method
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	



### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Thomas, G.B., Finney, R.L., Weir, M.D. and Giordano, F.R., 2003. <i>Thomas' calculus</i> . Reading: Addison-Wesley.	Yes
<b>Recommended Texts</b>	Hornsby, J., Lial, M.L. and Rockswold, G.K., 2011. <i>A Graphical Approach to Algebra and Trigonometry</i> . Addison Wesley.	No

APPENDIX:

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

	<p>Ministry of Higher Education and Scientific Research - Iraq University of Sumer College of Engineering Department of Mechanical Engineering</p>	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>STRENGTH OF MATERIALS</b>		Module Delivery
Module Type	CORE		<b>Theory</b> <b>Lecture</b> <b>Lab</b> <b>Tutorial</b> <b>Practical</b>
Module Code	ME201		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	
Administering Department	ME	College	Engineering
Module Leader	Dr. Thamer H. Amer	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Lecturer
Module Tutor	Dr. Thamer H. Amer	e-mail	
Peer Reviewer Name	Dr. Hussein R.	e-mail	
Review Committee Approval	01/06/20 23	Version Number	1



## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>		<b>Semester</b>	
<b>Co-requisites module</b>		<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>Strength of materials is a branch of applied mechanics that deals with the behavior of solid bodies subjected to various types of loading. The aims of this subject are:</p> <ol style="list-style-type: none"> <li>1- Recognize different types of loads that affects solid bodies include axially-loaded bars, shafts, beams, and columns.</li> <li>2- Define Hook's law that linked the stress with its strain.</li> <li>3- Identify the simple stresses in beams which include axile stress, shear stress produces by direct force and bearing stress.</li> <li>4- Identify the strain including lateral and longitudinal strain and links with Poison ratio.</li> <li>5- Discuss the effects of applying a torsional loading to a shaft or tube have a circular or noncircular cross section.</li> <li>6- Determine the external forces and stresses by statically indeterminate methods.</li> <li>7- Define power transmission by shaft subjected to torque.</li> <li>8- Identify thin-walled pressure vessels including cylindrical and spherical shapes</li> <li>9- Identify vessel subjected to fluid pressure</li> <li>10-Learn how to draw bending and shear force diagrams that distributed along with beam's axle.</li> <li>11-Explain the thermal stresses in beams that exposed to thermal effect beside the mechanical stresses.</li> <li>12-Explain the combined stresses and angle of twist of thin-walled tubes having noncircular section subjected to combined loads</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>A thorough understanding of the fundamentals of this subject is of vital importance because many of the formulas and rules of design cited in engineering codes are based upon the principles of this subject. After completing this module, a student will be able to:</p> <ol style="list-style-type: none"> <li>11. Recognize different types of loads and stresses that affect loaded beams.</li> </ol>

	<ol style="list-style-type: none"> <li>12. Find external forces and stresses in beams that statically indeterminate since the equilibrium equation(s) are not sufficient.</li> <li>13. Understand the stress distribution within the beam due to torsion load and identify the angle of twist of this beam having circular or noncircular section.</li> <li>14. Use the statically indeterminate methods to find the reactions, stresses and deflections in beams subjected to torsional or axil loads.</li> <li>15. Power Transmission in Beams Subjected to Torques.</li> <li>16. Identify Thermal Stresses in Beams</li> <li>17. Understand the Principals Design of Thin-Walled Tube and Thin-Walled Pressure Vessels.</li> <li>18. Draw the Shear Force and Bending Moment Distributed Along the Beams.</li> <li>19. Understand Combine Loads and the Stresses Result of Them.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Materials properties includes modulus of elasticity, modulus of rigidity and Poison’s ratio. Practical test includes tensile test (12hours).</p> <p>Simple Stresses, Normal Strain, Shear Stress and Bearing Stress, Shear Strain and Hook’s. (15 hours)</p> <p>Statically indeterminate of Reactions, Deflections and Stresses. (5 hours)</p> <p>Torsion and Angle of Twist, Power Transmission and Statically Indeterminate, Torsion of Solid Noncircular Shaft, and Thin-Walled Tube having Close Cross Sections. (20 hours)</p> <p>Thin-Walled Pressure Vessels and Vessels Subjected to Fluid Pressure. (8 hours)</p> <p>Shear and Moment Diagrams by Sections Method, and Graphical Method for Constructing Shear and Moment Diagram. (15 hours)</p>
<p><b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>Type something like: The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some practical tests.</p> <p>Encourage students to solve some selected homework from refences to practice solving engineering problems using stresses analysis route.</p>

<b>Student</b> الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	71	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	79	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As		Time /Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	5% (5)	4, 10	LO #2, 4, 9 and 10
	<b>Assignments</b>	2	5% (5)	6, 12	LO # 3, 5, 11 and 12
	<b>Report</b>	1	10% (10)	Continuous	
	<b>Projects / Lab.</b>	1	10% (10)	13	All
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	30% (30)	8	LO # 1-7
	<b>Final Exam</b>	3hr	40% (40)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
Week	Material Covered
<b>Week 1</b>	Simple Stresses and Normal Strain
<b>Week 2</b>	Shear Stress and Bearing Stress
<b>Week 3</b>	Shear Strain and Hook's Law
<b>Week 4</b>	Modulus of Rigidity and Pointon's Ratio
<b>Week 5</b>	Statically indeterminate of Reactions, Deflections and Stresses.
<b>Week 6</b>	Thermal Stresses
<b>Week 7</b>	Torsion and Angle of Twist
<b>Week 8</b>	<b>Midterm Exam</b>
<b>Week 9</b>	Power Transmission and Statically Indeterminate in Beams Subjected to Torsion Loads.
<b>Week 10</b>	Torsion of Solid Noncircular Shaft
<b>Week 11</b>	Thin-Walled Tube having Close Cross Sections.

<b>Week 12</b>	Thin-Walled Pressure Vessels and Vessels Subjected to Fluid Pressure.
<b>Week 13</b>	Shear and Moment Diagrams by Sections Method.
<b>Week 14</b>	Graphical Method for Constructing Shear and Moment Diagram
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Tensile Test
<b>Week 2</b>	Lab 1: Tensile Test
<b>Week 3</b>	Lab 2: Torsion test
<b>Week 4</b>	Lab 2: Torsion test
<b>Week 5</b>	Lab 3: Shear Centre in Unsymmetric Beams
<b>Week 6</b>	Lab 3: Shear Centre in Unsymmetric Beams
<b>Week 7</b>	Catch up
<b>Week 8</b>	Test

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	MECHANICS OF MATERIALS, Eighth Edition, R. C. HIBBELER	Yes
<b>Recommended Texts</b>	Mechanics of Materials, Singer Mechanics of Materials, Gere Mechanics of Materials, Hearn	No
<b>Websites</b>	<a href="https://classroom.google.com/u/0/h">https://classroom.google.com/u/0/h</a>	

**APPENDIX:**

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

	Ministry of Higher Education and Scientific Research - Iraq University of Sumer College of Engineering Department of Mechanical Engineering	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
Module Title	<b>THERMODYNAMICS</b>		Module Delivery
Module Type	CORE		<div style="background-color: red; color: black; padding: 2px; display: inline-block;">Theory</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Lecture</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Lab</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Tutorial</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Practical</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Seminar</div>
Module Code	<b>ME202</b>		
ECTS Credits	6		
SWL (hr/sem)	<b>150</b>		
Module Level	UGII	Semester of Delivery	
Administering Department	Me	College	Engineering
Module Leader	Dr. Ali Khaleel	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor	Dr. Ali Khaleel	e-mail	
Peer Reviewer Name	Dr. Ali Khaleel	e-mail	
Review Committee Approval	01/06/2023	Version Number	1.0

<b>Relation With Other Modules</b> العلاقة مع المواد الدراسية الأخرى			
<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	
<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Introducing the students to the laws of thermodynamics.</li> <li>2. Identifying thermodynamic systems.</li> <li>3. Understanding the phase change of material and apply it in producing energy.</li> <li>4. Knowing the ideal and real gas laws and its application.</li> </ol>		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>Upon completion of the course student should be able to:</p> <ol style="list-style-type: none"> <li>1. Apply the acquired theoretical professional knowledge in thermodynamic engineering.</li> <li>2. Apply mathematical method in the analysis of closed , open and an isolated systems.</li> <li>3. Explain phase change diagram of materials.</li> <li>4. Derive the first law of thermodynamic to know the relation between heat and work and energy types.</li> <li>5. Knowing thermodynamic processes for open and closed systems .</li> <li>6. Analyze of steady and unsteady state processes in flow processes.</li> </ol>		
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Introduction, Definition / force / pressure, Energy / resource / uses, Heat / work /</p> <p>power, Internal energy / enthalpy / zeroth law, Temperature and its measurement,</p>		

	<p>First law of thermodynamics / perpetual motion machine, Boyles law / Charles law,</p> <p>Equation of state / closed system processes, Constant volume pressure and processes,</p> <p>Adiabatic and polytropic processes, Open system processes / steady flow energy equation , and its application.</p>
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<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>
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<p><b>Strategies</b></p>	<p>Encouraging student participation in thermodynamics exercises requires a combination of effective teaching strategies and engagement techniques specific to the subject matter. Here's a strategy to promote active participation in thermodynamics exercises:</p> <ol style="list-style-type: none"> <li>1- Set clear learning goals and outcomes: <ul style="list-style-type: none"> <li>• Clearly communicate the learning objectives of the thermodynamics exercises.</li> <li>• Explain the relevance of thermodynamics concepts to real-world applications, emphasizing their importance in various engineering fields.</li> </ul> </li> <li>2- Break down complex concepts: <ul style="list-style-type: none"> <li>• Start with foundational concepts and gradually build up to more advanced topics</li> <li>• Use analogies, visual aids, and real-life examples to help students grasp abstract thermodynamics principles.</li> <li>• Provide step-by-step explanations and guide students through problem-solving techniques.</li> </ul> </li> <li>3- Provide regular feedback and guidance: <ul style="list-style-type: none"> <li>• Offer constructive feedback on students' problem-solving approaches, highlighting both correct and incorrect methods.</li> <li>• Provide individualized guidance and support to address students' specific difficulties or misconceptions.</li> <li>• Encourage students to seek clarification or ask questions during exercises, creating an environment where they feel comfortable seeking help.</li> </ul> </li> <li>4- Relate thermodynamics to real-world applications:</li> </ol>
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	<ul style="list-style-type: none"> <li>• Illustrate how thermodynamics concepts are applied in various engineering fields, such as energy systems, chemical processes, or environmental engineering.</li> <li>• Share case studies or success stories that demonstrate the practical significance of thermodynamics principles.</li> <li>• Assign exercises that require students to analyze and solve real-world thermodynamics problems, fostering engagement and motivation.</li> </ul> <p>5- Assess and recognize student participation:</p> <ul style="list-style-type: none"> <li>• Implement formative assessments, such as quizzes or short exercises, to gauge students' understanding and progress.</li> <li>• Recognize and reward active participation, effort, and improvement in thermodynamics exercises.</li> <li>• Provide opportunities for students to showcase their understanding through presentations or demonstrations.</li> </ul>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As	Time /Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11

<b>Formative assessment</b>	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Basic Concepts & Definitions of Thermodynamics
<b>Week 2</b>	Phase-Change Processes of Pure Substances
<b>Week 3</b>	T-v, P-v & P-T Diagrams of Phase-Change Materials
<b>Week 4</b>	Property Tables of (Steam, Ammonia, R-12, R-22, R-134a & Nitrogen)
<b>Week 5</b>	The Ideal-Gas Equation of State & The Compressibility Factor
<b>Week 6</b>	Forms of Work
<b>Week 7</b>	Mechanical Work, Electrical Work & Heat Transfer
<b>Week 8</b>	The First Law of Thermodynamics for Closed Systems
<b>Week 9</b>	Internal Energy, Specific Heats, Enthalpy & Specific Heats
<b>Week 10</b>	The Continuity Equation
<b>Week 11</b>	The First Law of Thermodynamics for Control Volume (Open System)
<b>Week 12</b>	The First Law for Steady State-Steady Flow Process

<b>Week 13</b>	The First Law for Uniform State-Uniform Flow Process
<b>Week 14</b>	Unsteady state flow
<b>Week 15</b>	Preparatory Week
<b>Week 16</b>	Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Thermal expansion of solid bodies Measuring using the expansion apparatus
<b>Week 2</b>	Lab 2: Observing the phase transition between the liquid and the gas phase at the critical point
<b>Week 3</b>	Lab 3: Pressure-dependency of the volume of a gas at a constant temperature (Boyle-Mariotte's law)

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Fundamentals of Engineering Thermodynamics ,Borgnakke & Sonntag and Wiley	Yes
<b>Recommended Texts</b>	Thermodynamics: An Engineering Approach, 5/e, by Yunus A. Cengel and Michael A. Boles	No
<b>Websites</b>	<a href="https://eng.utq.edu.iq/">https://eng.utq.edu.iq/</a>	

APPENDIX:

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

	Ministry of Higher Education and Scientific Research - Iraq University of Sumer College of Engineering Department of Mechanical Engineering	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	STRESSES ANALYSIS		Module Delivery
Module Type	CORE		<div style="background-color: red; color: black; padding: 2px; display: inline-block;">Theory</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Lecture</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Lab</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Tutorial</div> <div style="background-color: red; color: black; padding: 2px; display: inline-block;">Practical</div>
Module Code	ME204		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	
Administering Department	ME	College	Engineering
Module Leader	Dr. Ali Khaleel	e-mail	
Module Leader's Acad. Title	Lecturer		
Module Tutor	Dr. Ali Khaleel	e-mail	
Peer Reviewer Name	Dr. Masar Razaq	e-mail	
Review Committee Approval	01/06/20 23	Version Number	1.0

<b>Relation With Other Modules</b> العلاقة مع المواد الدراسية الأخرى			
<b>Prerequisite module</b>	Strength of Materials	<b>Semester</b>	Three
<b>Co-requisites module</b>		<b>Semester</b>	
<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
<b>Module Aims</b> أهداف المادة الدراسية	<p>The objective of analysis will be the determination of the stresses, strains, and deformations produced by the loads that applied on the solid bodies include axially-loaded bars, shafts, beams, and columns. A thorough understanding of the fundamentals of this subject is of vital importance because many of the formulas and rules of design cited in engineering codes are based upon the principles of this subject. The aims of this module are:</p> <ul style="list-style-type: none"> <li>20. To determine the stress distribution in beams including find the maximum bending stress and its location for better beam design.</li> <li>21. Learn how to find the direct shear stress distribution in beams including the maximum shear stress and its location.</li> <li>22. Describe the slope and deflection in beams using different methods like integration method or discontinuity method.</li> <li>23. Discuss the stresses in the composite beams that made of two different materials.</li> <li>24. Describe the stresses distribution in the curved beams and how to apply developed flexure formulas or combine stresses to design any curved member.</li> <li>25. Identify combined stresses and study some of applications subject to combined loads e.g. shear, normal and bending load.</li> <li>26. Explain the stresses at point using the mathematical equations or using Mohr's circle including find the principal stresses and the maximum shear stress with their orientations.</li> <li>27. Define the columns support axile loads and their buckling formulas.</li> <li>28. Identify the important failure theories that affect the design of the mechanical components.</li> </ul>		
<b>Module Learning Outcomes</b>	<p>By successfully completion of this module, the student will be expected to be able to:</p> <ul style="list-style-type: none"> <li>1- Identify list of the various terms associated with stress analysis to design the mechanical components.</li> </ul>		

مخرجات التعلم للمادة الدراسية	<p>2- Determine the maximum bending stress and maximum shear stress and their locations along loaded beams.</p> <p>3- Find the slope and deflection in loaded beams.</p> <p>4- Design curved beam subjected to flexure or combine load.</p> <p>5- Analysis stress at point to find the important mechanical properties which is critical for design like principals' stresses and maximum shear stresses.</p> <p>6- Understand the buckling in columns.</p> <p>7- Apply failure theories to design mechanical components.</p>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Stresses in Beams and Shear Stresses in Beams. (7hours)</p> <p>Slope and Deflection in Beams by integration Method and by Discontinuity Method. (15 hours)</p> <p>Composite Beams. (6 hours)</p> <p>Curved Beams. (6 hours)</p> <p>Combine Stresses. (8 hours)</p> <p>Combine Stresses (6 hours)</p> <p>Stresses at Point, Mohr's Circle in Stress and Mohr's Circle in Strain. (15)</p> <p>Columns. (6 hours)</p> <p>Theories of Failure. (6 Hours)</p>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some practical tests.</p> <p>Encourage students to solve some selected homework from references to practice solving engineering problems using stresses analysis route.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	146 + 4 hours (Final exam) = 150 hours/sem		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	5% (5)	4, 6	LO #2, 4 and 6
	<b>Assignments</b>	2	5% (5)	4, 14	LO # 3, 5, 8 and 14
	<b>Report</b>	1	10% (10)	Continuous	
	<b>Projects / Lab.</b>	1	10% (10)	13	All
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	30% (30)	8	LO # 1-7
	<b>Final Exam</b>	3hr	40% (40)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
Week	Material Covered
<b>Week 1</b>	Stresses in Beams
<b>Week 2</b>	Stresses in Beams
<b>Week 3</b>	Shear Stresses in Beams
<b>Week 4</b>	Slope and Deflection in Beams by Integration Methods
<b>Week 5</b>	Slope and Deflection in Beams by Discontinuity Method
<b>Week 6</b>	Slope and Deflection in Beams by Discontinuity Method
<b>Week 7</b>	Composite Beams
<b>Week 8</b>	Curved Beams
<b>Week 9</b>	Combine Stresses
<b>Week 10</b>	Stresses at Point
<b>Week 11</b>	Moher's Circle for Stresses
<b>Week 12</b>	Moher's Circle for Strain
<b>Week 13</b>	Columns
<b>Week 14</b>	Theories of Failure



<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Deflection of Simply Supported and Cantilever Beams
<b>Week 2</b>	Lab 1: Deflection of Simply Supported and Cantilever Beams
<b>Week 3</b>	Lab 2: Circular Bending in Beams
<b>Week 4</b>	Lab 2: Circular Bending in Beams
<b>Week 5</b>	Lab 3: Deflection of Curved Beams
<b>Week 6</b>	Lab 3: Deflection of Curved Beams
<b>Week 7</b>	Lab 4: Effect of End Conditions on Buckling Load
<b>Week 8</b>	Lab 4: Effect of End Conditions on Buckling Load
<b>Week 9</b>	Catch up
<b>Week 10</b>	Test

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	MECHANICS OF MATERIALS, Eighth Edition, R. C. Hibbeler	Yes
<b>Recommended Texts</b>	Mechanics of Materials, Singer Mechanics of Materials, Gere Mechanics of Materials, Hearn	No
<b>Websites</b>		

**APPENDIX:**

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

	Ministry of Higher Education and Scientific Research - Iraq University of Sumer College of Engineering Department of Mechanical Engineering	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>THERMODYNAMICS APPLICATIONS</b>		Module Delivery
Module Type	CORE		<div style="background-color: red; color: black; padding: 2px;">Theory</div> <div style="background-color: red; color: black; padding: 2px;">Lecture</div> <div style="background-color: red; color: black; padding: 2px;">Lab</div> <div style="background-color: red; color: black; padding: 2px;">Tutorial</div> <div style="background-color: red; color: black; padding: 2px;">Practical</div> <div style="background-color: red; color: black; padding: 2px;">Seminar</div>
Module Code	<b>ME206</b>		
ECTS Credits	6		
SWL (hr/sem)	<b>150</b>		
Module Level	UGII	Semester of Delivery	
Administering Department	ME	College	ER
Module Leader	Dr. Ali Khaleel	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	None	e-mail	None
Peer Reviewer Name	Dr. Mahmood H.	e-mail	khudheyer@utq.edu.iq
Review Committee Approval	01/06/20 23	Version Number	1.0

<b>Relation With Other Modules</b>			
العلاقة مع المواد الدراسية الأخرى			
<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	
<b>Module Aims, Learning Outcomes and Indicative Contents</b>			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
<b>Module Aims</b> أهداف المادة الدراسية	5. Introducing the students to the laws of thermodynamics. 6. Identifying thermodynamic systems. 7. Understanding the phase change of material and apply it in producing energy. 8. Identifying reversible and an irreversible processes. 9. Finding thermal efficiencies of rankine cycle, air standard cycles and vapor refrigeration cycles. 10. Understanding entropy generation for the ideal gas.		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	7. Apply the acquired theoretical professional knowledge in thermodynamic engineering. 8. Apply mathematical method in the analysis of closed , open and an isolated systems. 9. Explain phase change diagram of materials. 10. Know the Reversible and an irreversible process and application 11. Apply entropy change for ideal and real gas. 12. Explain The inequality of clausius application. 13. Analyze thermodynamically of steam power plants and refrigeration cycles. 14. Solve thermodynamic examples and do laboratory experiments as a team		
<b>Indicative Contents</b>			

المحتويات الإرشادية	Reversible and in reversible processes, Heat engine / reversed heat engine, Heat pump, Second law of thermodynamics, Cycle / Carnot cycle, Reversed Carnot cycle, Entropy / clauses in quality, Entropy in reversed processes, Entropy in reversed processes with heat transfer, Entropy in irreversible processes, Entropy in irreversible processes with heat transfer, Gases mixtures / Dalton's law, Avogadro's law / adiabatic mixing of gases.
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## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>Encouraging student participation in thermodynamics exercises requires a combination of effective teaching strategies and engagement techniques specific to the subject matter. Here's a strategy to promote active participation in thermodynamics exercises:</p> <p style="padding-left: 40px;">3- Set clear learning goals and outcomes:</p> <ul style="list-style-type: none"> <li>• Clearly communicate the learning objectives of the thermodynamics exercises.</li> <li>• Explain the relevance of thermodynamics concepts to real-world applications, emphasizing their importance in various engineering fields.</li> </ul> <p style="padding-left: 40px;">4- Break down complex concepts:</p> <ul style="list-style-type: none"> <li>• Start with foundational concepts and gradually build up to more advanced topics</li> <li>• Use analogies, visual aids, and real-life examples to help students grasp abstract thermodynamics principles.</li> <li>• Provide step-by-step explanations and guide students through problem-solving techniques.</li> </ul> <p style="padding-left: 40px;">3- Provide regular feedback and guidance:</p> <ul style="list-style-type: none"> <li>• Offer constructive feedback on students' problem-solving approaches, highlighting both correct and incorrect methods.</li> <li>• Provide individualized guidance and support to address students' specific difficulties or misconceptions.</li> <li>• Encourage students to seek clarification or ask questions during exercises, creating an environment where they feel comfortable seeking help.</li> </ul> <p style="padding-left: 40px;">4- Relate thermodynamics to real-world applications:</p> <ul style="list-style-type: none"> <li>• Illustrate how thermodynamics concepts are applied in various engineering fields, such as energy systems, chemical processes, or environmental engineering.</li> </ul>
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	<ul style="list-style-type: none"> <li>• Share case studies or success stories that demonstrate the practical significance of thermodynamics principles.</li> <li>• Assign exercises that require students to analyze and solve real-world thermodynamics problems, fostering engagement and motivation.</li> </ul> <p>5- Assess and recognize student participation:</p> <ul style="list-style-type: none"> <li>• Implement formative assessments, such as quizzes or short exercises, to gauge students' understanding and progress.</li> <li>• Recognize and reward active participation, effort, and improvement in thermodynamics exercises.</li> <li>• Provide opportunities for students to showcase their understanding through presentations or demonstrations.</li> </ul>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As	Time /Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11

Formative assessment	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Reversible and an irreversible process and application
Week 2	Introduction to the Second Law of Thermodynamics: Heat Engine, Refrigerator & Heat Pump
Week 3	Second law of thermodynamic application
Week 4	Entropy
Week 5	Principle of the Increase of Entropy
Week 6	Entropy Change of Ideal-Gas
Week 7	Reversible Steady-Flow Work
Week 8	The inequality of clausius application
Week 9	Adiabatic Efficiency of Steady-Flow Devices
Week 10	Gas Power Cycles; Otto Cycle & Diesel Cycle
Week 11	Ideal Brayton Cycle & Actual Brayton Cycle
Week 12	Vapor Power Cycles; Ideal Rankine Cycles & Actual Rankine Cycle

<b>Week 13</b>	Reheat Cycle
<b>Week 14</b>	Vapor Refrigeration Cycles; Ideal Vapor-Compression Refrigeration Cycle
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Determining the efficiency of the heat pump as a function of the temperature differential
<b>Week 2</b>	Lab 2: Vapor Refrigeration Cycle
<b>Week 3</b>	Lab 3: Determining the specific heat of water

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Fundamentals of Engineering Thermodynamics ,Borgnakke & Sonntag and Wiley	Yes
<b>Recommended Texts</b>	Thermodynamics: An Engineering Approach, 5/e, by Yunus A. Cengel and Michael A. Boles	No
<b>Websites</b>	<a href="https://eng.utq.edu.iq/">https://eng.utq.edu.iq/</a>	



APPENDIX:

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

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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
Module Title	<b>ENGINEERING OF METALLURGY</b>		Module Delivery
Module Type	CORE		<b>Theory</b> <b>Lecture</b> <b>Lab/ Practical</b> <b>Tutorial</b> <b>Seminar</b>
Module Code	<b>ME208</b>		
ECTS Credits	5		
SWL (hr/sem)	<b>125</b>		
Module Level	UGII	Semester of Delivery	
Administering Department	ME	College	ER
Module Leader	Dr. Ali Khaleel	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor	Dr. Ali Khaleel	e-mail	
Peer Reviewer Name	Dr. Ali Khaleel	e-mail	
Review Committee Approval	20 /06/2023	Version Number	

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>		<b>Semester</b>	
<b>Co-requisites module</b>		<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>This module aims to:</p> <ol style="list-style-type: none"> <li>1. develop an understanding of the applied metallurgy of principal engineering alloys, to include structure &amp; properties of metals and alloys, Phase diagrams, metal extraction, ferrous materials, heat treatments,</li> <li>2. provide the background necessary to make informed decisions and recommendations concerning the suitability of metals and alloys for engineering applications. It explores the way in which alloys are used and the way in which production and fabrication routes influence their fitness for purpose.</li> <li>3. help in understanding the chemical make-up and different macroscopic and microscopic structure.</li> <li>4. The microstructure of a metal, the structural features that are control to observation under a microscope.</li> <li>5. Chemical composition is the relative content of a particular element within an alloy, usually expressed as a percent weight. Metals and their alloys are widely used in our daily live.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p><b>On completion of the module, the student is expected to:</b></p> <ol style="list-style-type: none"> <li>1. Gain knowledge and understanding of applied metallurgy (structure, properties, application, etc.).</li> <li>2. Develop skills in material selection and processes used for physical property manipulation</li> <li>3. Be able to apply the knowledge gained across a range of industrial sectors.</li> <li>4. Understand the structures, properties and applications of metals.</li> <li>5. Apply the acquired knowledge to make appropriate materials selection for engineering applications.</li> </ol>
<p><b>Indicative Contents</b></p>	

<p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ul style="list-style-type: none"> <li>• Introduction to the structure of metals, reviewing aspects such as crystal structure, mechanical properties, crystal defects and their effects on alloy properties</li> <li>• Application of metallurgical principles in the extraction and processing of iron and aluminium</li> <li>• Theory of diffusion and the phenomenon of mass transport for heat treatments</li> <li>• Phase diagrams (equilibrium and non-equilibrium conditions), focusing on steel phase transformations</li> <li>• Heat treatments, primarily for steel alloys; hardening, softening and conditioning</li> </ul>
<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:</p> <p>Gain knowledge and understanding of applied metallurgy</p> <p>Exhibit knowledge of fundamental materials science over a range of common engineering alloys</p> <p>Demonstrate understanding of heat treatments, corrosion science and welding engineering</p> <p>Develop skills in material selection and processes used for physical property manipulation</p> <p>Demonstrate understanding and application of material selection principles</p> <p>Evidence competence in applying advanced strategies for material and process selection</p> <p>Be able to apply knowledge across several industrial sectors</p> <p>Present understanding of diverse heat treatment processes within an industrial context</p>

	Exhibit knowledge of the degradation phenomena influencing a variety of engineering materials
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	64	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> تقييم المادة الدراسية					
As		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	10% (10)	5, 10, 15	
	<b>Assignments</b>	2	5% (5)	6, 12	
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	5% (5)	13	
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	20% (20)	7	
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction
Week 2	Classification of engineering materials
Week 3	Crystal structure
Week 4	Imperfections in crystals
Week 5	Solidification, Cooling Curves, Nucleation, Equilibrium Diagrams
Week 6	Thermal Equilibrium diagrams, Substitution solid solution, Interstitial solid solution, BINARY ISOMORPHOUS SYSTEMS
Week 7	Lever rule
Week 8	Applications on binary phase diagrams
Week 9	Miller indices
Week 10	XRD and Bragg's law
Week 11	Heat Treatment of Steel, Types of Heat Treatment Processes, Annealing
Week 12	Normalizing, Hardening, Tempering, Nitriding, Carburising, Case hardening or surface hardening
Week 13	Alloy Steel, Manganese Steel, stainless steel
Week 14	Austenitic steels, ferritic steels, Martensitic steels, Duplex stainless steels, Precipitation-hardening stainless steel, Tool steel
Week 15	<b>Preparatory Week</b>
Week 16	<b>Final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Introduction to materials properties
Week 2	Lab 2: Sample preparation
Week 3	Lab 3: Microstructure inspection by optical microscopy
Week 4	Lab 4: Heat treatments
Week 5	Lab 5: Heat treatments
Week 6	Lab.6 Microhardness test

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Materials Science and Engineering, An Introduction ( William D. Callister, Jr.)  Engineering Metallurgy by E. C. Rollason, (ELBS)	Yes
Recommended Texts	Introduction to MATERIALS SCIENCE FOR ENGINEERS (James F.Shackelford)	No
Websites	<a href="https://www.coursera.org/browse/physical-science-and-engineering/Metallurgy-engineering">https://www.coursera.org/browse/physical-science-and-engineering/Metallurgy-engineering</a>	

APPENDIX:

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



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## نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
<b>Module Title</b>	<b>HUMAN RIGHT AND DEMOCRACY</b>		<b>Module Delivery</b>
<b>Module Type</b>	SUPPLEMENT		<b>Theory</b> <b>Lecture</b> <b>Tutorial</b> <b>Seminar</b> <b>Lab</b>
<b>Module Code</b>	UR 201		
<b>ECTS Credits</b>	2		
<b>SWL (hr/sem)</b>	50		
<b>Module Level</b>	UGII	<b>Semester of Delivery</b>	
<b>Administering Department</b>	ME	<b>College</b>	Engineering
<b>Module Leader</b>	Rashed Raad	<b>e-mail</b>	
<b>Module Leader's Acad. Title</b>	Lecturer		
<b>Module Tutor</b>	Hussein R. Taresh	<b>e-mail</b>	
<b>Peer Reviewer Name</b>	Dr. Ali Khaleel	<b>e-mail</b>	
<b>Review Committee Approval</b>	12/06/2023	<b>Version Number</b>	1.0

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>		<b>Semester</b>	
<b>Co-requisites module</b>		<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<p>نشر ثقافة حقوق الإنسان وتربية الناس عليها تلك التربية التي تقوم على الممارسة والمشاركة الصادقة وتنمية معارفهم ومهاراتهم المنسجمة مع مبادئ حقوق الإنسان المُعترف بها دولياً استناداً لمبدأ الحق والحرية للمواطن والسيادة للشعب. من خلال معرفة ماهية هذه الحقوق ومضمونها وجنورها وتطورها عبر مراحل التاريخية المختلفة والوقوف على أشكالها وخصائصها وابرز التحديات العالمية التي تواجهها. والبحث في كيفية ضمان حقوق الإنسان في موائيق المنظمات الدولية ولاسيما الامم المتحدة فضلاً عن المنظمات غير الحكومية.</p>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>مخرجات المقرر وطرائق التعليم والتعلم والتقييم</p> <p>أ- المعرفة والفهم</p> <p>1- توعية الطالب بالتطور التاريخي لحقوق الانسان من خلال بيان تطورها والمراحل المختلفة التي مرت بها حتى وقتنا الحاضر.</p> <p>2- تعريف الطالب بحقوق الانسان في الاديان السماوية والتأكيد على دور الدين الاسلامي الذي حفظ هذه الحقوق بشكل مميز.</p> <p>3- توعية الطالب العراقي بحقوقه المدنية والسياسية والاقتصادية والاجتماعية والثقافية.</p> <p>4- ان يتعرف الطالب عن دور الامم المتحدة وبداياتها في دعم وتشكيل مبادئ حقوق الانسان ومن ثم تطورهما وتأسيس منظمات حقوق الانسان المختلفة.</p> <p>5- أن يتمكن الطالب من معرفة الحقوق والحريات التي نص عليها الدستور العراقي لعام 2005.</p> <p>6- إن يتمكن الطالب من الدفاع عن حقوقه وذلك بعد امتلاك ثقافة حقوق الانسان.</p>
<b>Indicative Contents</b> المحتويات الإرشادية	None

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	None
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	50		

## Module Evaluation

### تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	تاريخية حقوق الانسان
Week 2	تاريخية حقوق الانسان في الحضارات العراقية و الحضارة اليونانية والفارسية و الرومانية و المصرية
Week 3	حقوق الانسان في الديانات السماوية اليهودية و الاسلام و المسيحية
Week 4	تاريخية حقوق الانسان في العصور الوسطى
Week 5	حقوق الانسان في تشريعات حقوق
Week 6	حقوق الانسان والتحديد و التعريف
Week 7	اشكال حقوق الانسان
Week 8	حقوق الانسان المدنية و السياسية
Week 9	حقوق الانسان الاقتصادية و الاجتماعية و السياسية
Week 10	حقوق الانسان الحديثة
Week 11	حقوق الانسان في الاعلان العالمي
Week 12	المنظمات الغير حقوقية و حقوق الانسان
Week 13	حقوق الانسان في الدستور العراقي 2005
Week 14	ضمانات و احترام حقوق الانسان
Week 15	ضمانات حقوق الانسان في الرقابة الدستورية
Week 16	الاعداد للمتحان النهائي

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

Week	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		Yes
Recommended Texts		No

#### APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

**Note:**

NB 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 Sumer College of Engineering Department of Mechanical Engineering	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
Module Title	<b>MECHANICAL DRAWING</b>		Module Delivery
Module Type	CORE		<b>Theory</b> <b>Lecture</b> <b>Lab</b> <b>Tutorial</b> <b>Practical</b> <b>Seminar</b>
Module Code	<b>ME206</b>		
ECTS Credits	7		
SWL (hr/sem)	<b>150</b>		
Module Level	UGII	Semester of Delivery	
Administering Department	ME	College	ER
Module Leader	Dr. Masar Khadim	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	None	e-mail	None
Peer Reviewer Name	Dr. Mahmood H.	e-mail	
Review Committee Approval	01/06/20 23	Version Number	1.0

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<p>1 -Understand the importance of mechanical drawing for the engineer and its applications</p> <p>2 -Recognizing the basics of representing the various mechanical parts in engineering drawing and the student's awareness of mechanical drawing as one of the scientific bases for working in the implementation of mechanical works.</p> <p>3 -Teaching the student the important role of drawing in achieving solutions to technical problems in designing machines, machines, devices, tools, and implementing and manufacturing mechanical parts.</p> <p>4 -Teaching the student the principles of assembling and dismantling mechanical systems, methods of connecting parts, the foundations of welding, and how to write their symbols</p> <p>5- The student learned how to write and read mechanical drawing boards in general.</p>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>A- Knowledge and Understanding</p> <p>A1. Acquisition of skills in drawing mechanical parts and knowledge of engineering symbols and terms and standard specifications in engineering and mechanical drawing with the necessary skill to read and write industrial drawings.</p>



	<p>A2- Acquiring basic skills as an introduction to design programs such as AutoCAD and other programs that are applied in practical applications.</p> <p>A3- Gain a basic understanding of how to draw simple and complex assembled mechanical parts in practical life</p> <p>A4- Informing the student of the role of engineering drawing and its relationship to the production of various industrial products and drawing them in all their fine details.</p> <p>B. Subject-specific skills</p> <p>B1. The student acquires the skill to read and understand the schematics of mechanical parts and systems resulting from their assembly</p> <p>B 2- Representation of the individual mechanical parts and the resulting systems from their assembly by mechanical drawing.</p> <p>B 3- Acquiring the skill of connecting mechanical parts and the foundations of assembling and dismantling mechanical systems.</p> <p>B4- Read and represent all the minute details of the surfaces and properties of metals and the methods of connecting mechanical systems.</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>A- Knowledge and Understanding</p> <p>A1. Acquisition of skills in drawing mechanical parts and knowledge of engineering symbols and terms and standard specifications in engineering and mechanical .drawing with the necessary skill to read and write industrial drawings</p> <p>A2- Acquiring basic skills as an introduction to design programs such as AutoCAD and .other programs that are applied in practical applications</p> <p>A3- Gain a basic understanding of how to draw simple and complex assembled mechanical parts in practical life</p> <p>A4- Informing the student of the role of engineering drawing and its relationship to 3 the production of various industrial products and drawing them in all their fine .details</p> <p>B. Subject-specific skills</p> <p>B1. The student acquires the skill to read and understand the schematics of mechanical parts and systems resulting from their assembly</p>

	<p>B 2- Representation of the individual mechanical parts and the resulting systems . from their assembly by mechanical drawing</p> <p>B 3- Acquiring the skill of connecting mechanical parts and the foundations of .assembling and dismantling mechanical systems</p> <p>B4- Read and represent all the minute details of the surfaces and properties of .metals and the methods of connecting mechanical systems</p>
<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>	
<b>Strategies</b>	<p>1- The lectures and their inclusion of various methods such as pictures, drawings and models as means of clarification to explain and draw topics in detail.</p> <p>2- Asking questions and inquiries that are distinguished by depth and accuracy.</p> <p>3- Directing the student towards the many practical questions of the subject.</p> <p>4- Develop the digital sense of expression.</p> <p>5- Brainstorming.</p>

<p><b>Student Workload (SWL)</b></p> <p>الحمل الدراسي للطالب</p>			
<b>Structured SWL (h/sem)</b>	93	<b>Structured SWL (h/w)</b>	6
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
<b>Unstructured SWL (h/sem)</b>	82	<b>Unstructured SWL (h/w)</b>	2
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
<b>Total SWL (h/sem)</b>	175		
الحمل الدراسي الكلي للطالب خلال الفصل			

## Module Evaluation

تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	A review of drawing lines and projections in the first and third projection angles and free drawing + Screw threads
Week 2	Screw fastening and nuts + Rivets and rivets joints
Week 3	Keys, cotter- joints and pin joints + Shaft coupling
Week 4	Welded joints + Detail drawing (part drawing)
Week 5	Engen parts/ pistons + stuffing box & crossheads
Week 6	Cranks and Connecting rod + Eccentric

<b>Week 7</b>	Assembly drawing + Shaft Bearings
<b>Week 8</b>	Pulleys
<b>Week 9</b>	Welded joints
<b>Week 10</b>	Welded joints
<b>Week 11</b>	Spur Gears
<b>Week 12</b>	Fits, limits and Tolerance
<b>Week 13</b>	Surface finishing
<b>Week 14</b>	Valves
<b>Week 15</b>	Drawing analysis
<b>Week 16</b>	Drawing analysis

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	1-Mechanical Drawing /Shri N.D Bhat	Yes

<b>Recommended Texts</b>		No
<b>Websites</b>		

**APPENDIX:**

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

	Ministry of Higher Education and Scientific Research - Iraq University of Sumer College of Engineering Department of Mechanical Engineering	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
<b>Module Title</b>	<b>COMPUTER PROGRAMMING</b>		<b>Module Delivery</b>
<b>Module Type</b>	BASIC		Theory Lecture Lab/ Practical Tutorial Seminar
<b>Module Code</b>	ER 202		
<b>ECTS Credits</b>	4		
<b>SWL (hr/sem)</b>	100		
<b>Module Level</b>	UGII	<b>Semester of Delivery</b>	
<b>Administering Department</b>	ME	<b>College</b>	ER
<b>Module Leader</b>	Dr. Ali Khaleel	<b>e-mail</b>	
<b>Module Leader's Acad. Title</b>	Lecturer	<b>Module Leader's Qualification</b>	
<b>Module Tutor</b>	Dr. Taqwaa Alaa	<b>e-mail</b>	
<b>Peer Reviewer Name</b>	Dr. Taqwaa Alaa	<b>e-mail</b>	
<b>Review Committee Approval</b>	20 /06/2023	<b>Version Number</b>	

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	ER 102	<b>Semester</b>	1
<b>Co-requisites module</b>		<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<p>The theoretical foundations of computer engineering have expanded substantially in recent years. The objective of this course is to introduce students to this fundamental area of computer science which enables students to focus on the study of programming languages. These languages allow the students to assess what could be achieved through computing when they are using it to solve problems in science and engineering. The course exposes students to the programming with C++, as well as to its usage for problem solving. The course introduces basic programming instructions and their properties, and the necessary mathematical libraries to develop different software applications. Upon completion of this course the students are expected to become proficient in key topics of C++ programming, and to have the opportunity to explore the current topics in this area</p>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Clarify the basic concepts of programming in C++ through a set of programming instructions.</li><li>2. Gain skills in handling programming problems and issues.</li><li>3. Acquiring basic skills as an introduction to building large and applied programs.</li><li>4. Gain a basic understanding of how programmed systems work in various industrial applications.</li><li>5. Ability to program and design application programs.</li><li>6. The ability to think about addressing a particular problem or issue.</li><li>7. Writing scientific reports.</li><li>8. The ability to gain experience in dealing with programmed systems</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"><li>1. Readings, self-learning, panel discussions.</li><li>2. Exercises and activities in the lecture.</li><li>3. Homework.</li><li>4. Directing students to some websites to benefit</li></ol>

	and develop capabilities. 5. Conducting seminars to explain and analyze a specific issue and find solutions to it.
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>.1Explanation and clarification through lectures.</p> <p>.2The method of displaying scientific materials on display devices: data show, smart boards, and plasma screens.</p> <p>.3Self-learning through homework and mini-projects within the lectures.</p> <p>.4Laboratories.</p> <p>.5Graduation projects.</p> <p>.6Scientific visits.</p> <p>.7Seminars held in the department.</p> <p>.8Summer training</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	64	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		



## Module Evaluation

تقييم المادة الدراسية

As		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	10% (10)	5, 10, 15	
	<b>Assignments</b>	2	5% (5)	6, 12	
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	5% (5)	13	
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	20% (20)	7	
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
<b>Week 1</b>	Week 1 Introduction-Algorithms-Example of Algorithms
<b>Week 2</b>	Week 2 Flowcharts-Symbols and Idiomatic Forms in Flowcharts- Types of Flowcharts
<b>Week 3</b>	Week 3 Completing the topic of Flowcharts type-Example of Flowcharts
<b>Week 4</b>	language program parts- language components (language ++Basics of programming in C codes, special words, variables)
<b>Week 5</b>	Week 5 Office functions, types of variables, logical expressions
<b>Week 6</b>	Week 6 Arithmetic tools- priority of arithmetic and logical operations- illustrative examples
<b>Week 7</b>	Week 7 Input and output order- Directing characters- Formatted console for input and output operations

<b>Week 8</b>	Week 8 Completing the Formatted console for input and output operations- illustrative examples
<b>Week 9</b>	Week 9 Conditional Statements (if statement- if-else statement-if-else-if statement-Compound if)
<b>Week 10</b>	Conditional Statements (switch statement-Conditional Ternary Operator- illustrative examples)
<b>Week 11</b>	Loop Statements (for-statement, while-statement- do-while statement-illustrative examples)
<b>Week 12</b>	Week 12 Loop Statements Nested Loop Statements- illustrative examples
<b>Week 13</b>	Week 13 One-Dimensional Arrays-illustrative example
<b>Week 14</b>	Week 14 Two- Dimensional Arrays- Operations on Array
<b>Week 15</b>	Week 15 Completing the topic of operations on Arrays-illustrative examples
<b>Week 16</b>	Week 16 Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

<b>Week</b>	<b>Material Covered</b>
<b>Week 1</b>	Week 1 Lab 1: Steps to create, compile and implement a program using Microsoft visual C++ 6.0

<b>Week 2</b>	Week 2 Lab 2: Implement programs for conditional statements (if-statement)
<b>Week 3</b>	Week 3 Lab 3: Implement programs for conditional statements (switch-statement)
<b>Week 4</b>	Week 4 Lab 4: Implement programs for Loop statements (for-statement)
<b>Week 5</b>	Week 5 Lab 5: Implement programs for conditional statements (while-statement, do-while-statement)
<b>Week 6</b>	Week 6 Lab 6: Implement programs for Array (one dimension)
<b>Week 7</b>	Week 7 Lab 7: Implement programs for Array (two-dimension)

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>		Yes
<b>Recommended Texts</b>		No
<b>Websites</b>		

**APPENDIX:**

<b>GRADING SCHEME</b> مخطط الدرجات				
<b>Group</b>	<b>Grade</b>	<b>التقدير</b>	<b>Marks (%)</b>	<b>Definition</b>
	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance

<b>Success Group</b> <b>(50 - 100)</b>	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX – Fail</b>	مقبول بقرار	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required

Note:

NB 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 Sumer College of Engineering Department of Mechanical Engineering	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
Module Title	<b>STATIC FLUID</b>		Module Delivery
Module Type	CORE		Theory Lecture Lab/ Practical Tutorial Seminar
Module Code	<b>ME203</b>		
ECTS Credits	5		
SWL (hr/sem)	<b>125</b>		
Module Level	UGII	Semester of Delivery	
Administering Department	ME	College	ER
Module Leader	Dr. Ali Khaleel	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor	Dr. Taqwaa Alaa	e-mail	
Peer Reviewer Name	Dr. Taqwaa Alaa	e-mail	
Review Committee Approval	20 /06/2023	Version Number	

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>		<b>Semester</b>	
<b>Co-requisites module</b>		<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>A general introduction to the types of fluids and an explanation of their mechanical properties. In addition, an expansion of the explanation of fluid at rest and its applications such as: pressure gauges, gates. Knowing the forces that are exerted on objects as a result of fluid pressure (floating/submerged objects and relative equilibrium of floating objects). Finally, a comprehensive introduction to fluid motion and the equations required (continuity equation) to solve the problem of fluids in motion.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>A- Cognitive Objectives</p> <ol style="list-style-type: none"> <li>1. The student will demonstrate the ability to classify fluid based on a number of parameters such as viscosity, density ... etc.</li> <li>2. The student will understand the concept of a fluid at rest and how to find the pressure of a fluid column and analyze the forces produced by the fluid itself.</li> <li>3. The student will demonstrate the ability to analyze the forces exerted on straight and curved gates in the case of submerged or partially submerged cases.</li> <li>4. Determine the difference between the forces produced by a fluid in a static and moving position.</li> </ol> <p>B- Skill Objectives</p> <ol style="list-style-type: none"> <li>1. Apply static pressure measuring devices to measure the pressure of a fluid column.</li> <li>2. Use mathematical skills to solve fluid mechanics problems in a static position.</li> </ol>

	<p>3. Use basic and mathematical knowledge to know the differences between a fluid in motion and at rest, and how to derive the mathematical continuity equation.</p> <p>C- General and qualifying skills (other skills related to employability and personal development).</p> <p>1. Developing the student's ability to perform assignments and submit them on time.</p> <p>2. Logical and programming thinking to find software solutions to various issues.</p> <p>3. Developing the student's ability to dialogue and discuss.</p> <p>4. Developing the student's ability to deal with modern technology and electronic classes.</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	
<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></p>	<p>The learner's scientific and research skills are developed through teaching and learning activities, analysis skills and solving specialized problems that deal with fluid problems. Education starts from simple and familiar engineering applications and is then developed further by a set of problems prepared by the teacher through small study groups and evaluation and response to all submitted work. Teaching is done in the usual theoretical presentation method using blackboards and relying on the (how and why) method to motivate the student to learn and know.</p>

<p><b>Student Workload (SWL)</b></p> <p>الحمل الدراسي للطالب</p>			
<p><b>Structured SWL (h/sem)</b></p> <p>الحمل الدراسي المنتظم للطالب خلال الفصل</p>	64	<p><b>Structured SWL (h/w)</b></p> <p>الحمل الدراسي المنتظم للطالب أسبوعياً</p>	4
<p><b>Unstructured SWL (h/sem)</b></p>	61	<p><b>Unstructured SWL (h/w)</b></p>	2

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b>					
تقييم المادة الدراسية					
As		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	10% (10)	5, 10, 15	
	<b>Assignments</b>	2	5% (5)	6, 12	
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	5% (5)	13	
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	20% (20)	7	
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		
<b>Delivery Plan (Weekly Syllabus)</b>					
المنهاج الاسبوعي النظري					
Week	Material Covered				
<b>Week 1</b>	General introduction to fluid mechanics				
<b>Week 2</b>	Classification of fluid				



<b>Week 3</b>	Introduction Fluid in static
<b>Week 4</b>	Measuring fluid pressure by Manometers
<b>Week 5</b>	Forces in submerged/ immersed plane surface
<b>Week 6</b>	Forces in submerged/ immersed curved surfaces
<b>Week 7</b>	Linear relative acceleration of fluid
<b>Week 8</b>	Rotational relative motion of fluid
<b>Week 9</b>	Forces on submarines and ships
<b>Week 10</b>	Design parameters to obtain equilibrium in floating bodies
<b>Week 11</b>	Loop Statements (for-statement, while-statement- do-while statement-illustrative examples)
<b>Week 12</b>	Introduction to fluid motion and classifying fluid flo
<b>Week 13</b>	Introduction to fluid motion and classifying fluid flo
<b>Week 14</b>	Derive the continuity equation
<b>Week 15</b>	Derive the continuity equation
<b>Week 16</b>	

**Delivery Plan (Weekly Lab. Syllabus)**

المنهاج الاسبوعي للمختبر

Week	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		Yes
Recommended Texts		No
Websites		

APPENDIX:

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