

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mechanics and Strength of Material		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory
Module Code	ENG114		<input type="checkbox"/> Lecture
ECTS Credits	6		<input checked="" type="checkbox"/> Lab
SWL (hr/sem)	150		<input type="checkbox"/> Tutorial
			<input type="checkbox"/> Practical
			<input type="checkbox"/> Seminar
Module Level	UGI	Semester of Delivery	1
Administering Department	OGE	College	Engineering
Module Leader	Ali Basem	e-mail	Ali.basem@uowa.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	NA	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/11/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	<p>This module covers two main parts:</p> <ul style="list-style-type: none">•Fundamental principles, about the motion, velocity, newton's laws, static inertia, fluid inertia, sliding friction, rolling friction and help the student to solve and understand the problems.•Strength of material is the discipline of investigating the relationships that exist between the structures and properties of materials. Engineering material is designing or engineering the structure of a material to produce a predetermined set of properties. This part covers principles of stress and strain. Develops understanding of force, heat deformation, material properties, allowable strength, young modulus Poisson ratio. It also covers hook laws, shear stress, Mohr circles, and the general strain energy equation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1- The program prepares students for research and development in many frontier areas of engineering, including such as newton's laws, static and dynamic mechanics.2-All students study the core theoretical subjects of fluid mechanics, dynamics, supplemented by courses in mathematics.3- The program can be tailored to a student's interests through electives in engineering, mechanics or other applied sciences.4 The program learn students the fundamental concepts of stress and strain.5- Explain the concepts of shear and bearing stress.6- Learn the Allowable force and safety factor for design materials.7- Analysis and draw the Mohr's circle with bending diagrams

<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p> <p>Part I: fundamentals of Engineering Mechanics</p> <p>principles, about the motion, velocity, newton's laws, static inertia, fluid inertia, sliding friction, rolling friction and help the student to solve and understand the problems. . (24 hrs)</p> <p>Part II: Strength of material fundamentals</p> <p>principles of stress and strain. Develops understanding of force, heat deformation, material properties, allowable strength, young modulus Poisson ratio. It also covers hook laws, shear stress, Mohr circles, and the general strain energy equation. (28 hrs)</p>
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<p>Learning and Teaching Strategies</p> <p>استراتيجيات التعلم والتعليم</p>	
<p>Strategies</p>	<p>The main strategy that will be adopted in delivering this module is to Encourage students to ask and answer questions, as well as presenting many experimental work labs to increase students' knowledge.</p>

<p>Student Workload (SWL)</p> <p>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا</p>			
<p>Structured SWL (h/sem)</p> <p>الحمل الدراسي المنتظم للطالب خلال الفصل</p>	90	<p>Structured SWL (h/w)</p> <p>الحمل الدراسي المنتظم للطالب أسبوعيا</p>	6
<p>Unstructured SWL (h/sem)</p> <p>الحمل الدراسي غير المنتظم للطالب خلال الفصل</p>	57	<p>Unstructured SWL (h/w)</p> <p>الحمل الدراسي غير المنتظم للطالب أسبوعيا</p>	4
<p>Total SWL (h/sem)</p> <p>الحمل الدراسي الكلي للطالب خلال الفصل</p>	150		
<p>Module Evaluation</p>			

تقييم المادة الدراسية

		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	All
	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

	Material Covered
Week	Newton's laws
Week	Types of the Fractions
Week	Velocity, velocity and accelerations
Week	Plane curvilinear motion (x-y) coordinate
Week	Plane curvilinear motion (n-t) coordinate
Week	Plane curvilinear motion (r- θ) coordinate
Week	Curvilinear motion
Week	stress, strain, Relationship between stress and strain.

Week	Study the concept of Shear Stress, Bearing Stress and Shear Strain.
Week	Allowable working stress factor of safety and the Thermal Stress and Strain.
Week	Elastic Constants (young modulus, Poisson ratio, shear modulus and bulk modulus).
Week	Principle stress (maximum and minimum stress).
Week	Mohr's circle and Principal strain.
Week	Drawing the shear force and bending moment diagrams, Theory of shearing stress in beams.
Week	Study the Beams, types and subject loads, Theory of bending stress in beams with calculations
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Tensile test
Week 2	Hardness test
Week 3	Impact test
Week 4	Particles size analysis
Week 5	Properties of engineering materials with regular shape test
Week 6	Properties of engineering materials with irregular shape test
Week 7	Study the passivity phenomenon test
Week 8	Torsion test
Week 9	Bending test

Week 10	Deflection of beam test
Week 11	Determination of moisture content
Week 12	Calculation of water formation test

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<p>Engineering Mechanics: Statics & Dynamics 14th Edition</p> <p>Engineering Mechanics - Statics and Dynamics Book by A. Bedford and Wallace Fowler</p>	
Recommended Texts	<p>Hibbeler Dynamics</p> <p>Engineering Mechanics: Statics & Dynamics by Russell C. Hibbeler</p> <p>Philpot, Timothy A., and Jeffery S. Thomas. Mechanics of materials: an integrated learning system. John Wiley & Sons, 2020.</p> <p>Timoshenko, Stephen. History of strength of materials: with a brief account of the history of theory of elasticity and theory of structures. Courier Corporation, 1983.</p>	
Websites		

Grading Scheme

مخطط الدرجات

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

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