

	<p>Ministry of Higher Education and Scientific Research - Iraq</p> <p>University of Warith Al_Anbiyaa Engineering Department</p> <p>Refrigeration and Air Conditioning Techniques Engineering</p>	
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## MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Strength of Materials		Module Delivery
Module Type	C		<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MPAC206		
ECTS Credits	11		
SWL (hr/sem)	275		
Module Level	2	Semester of Delivery	
Administering Department	BSc-MPAC	College	Engineering
Module Leader	Noor Kareem	e-mail	<a href="mailto:noor.kareem@uowa.edu.iq">noor.kareem@uowa.edu.iq</a>
Module Leader's Acad. Title	Ass. Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	31.08.2025	Version Number	1.0

### Relation with other Modules

## العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	MPAC107	<b>Semester</b>	L1- S2
<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	This course is the foundation to many advanced techniques that allow engineers to design machine components, mechanisms, predict failure and understand the physical properties of materials. Mechanics of Materials gives the student basic tools for stress, strain and deformation analysis. Methods for determining the stresses, strains and deformations produced by applied loads are presented. Engineering design concepts are integrated throughout the course.		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>1. To apply the formal theory of solid mechanics to calculate forces, deflections, moments, stresses, and strains in a wide variety of structural members subjected to tension, compression, torsion, bending, both individually and in combination, including :</p> <ul style="list-style-type: none"> <li>• axially loaded bars</li> <li>• components in pure shear</li> <li>• circular shafts in torsion</li> <li>• beams in bending</li> <li>• thin-walled pressure vessels</li> </ul> <p>2. Determine the stresses and strains in members subjected to combined loading and apply the theories of failure for static loading</p> <p>3. To determine principal stresses and angles, maximum shearing stresses and angles, and the stresses acting on any arbitrary plane within a structural element.</p> <p>4. Analyze slender, long columns subjected to axial loads</p> <p>5. Determine the deflections and rotations produced by the flexural loading.</p>		
<b>Indicative Contents</b> المحتويات الإرشادية	<p><b><u>Indicative content includes the following.</u></b></p> <p>Give the students information about</p> <p>stress and strain, [12 hrs]</p> <p>Thermal stress, [12 hrs]</p> <p>Thin Walled stress torsion, [12 hrs]</p> <p>Thin Walled Torsion, [12 hrs]</p> <p>Shear force and bending moment diagram, [12 hrs]</p> <p>complex stress , [12 hrs]</p> <p>Mohr's circle. [12 hrs]</p>		

	<p>Sum. <math>7*12=84</math>  with lab. Part test for  tensile, [4 hrs]  impact, [4 hrs]  hardness , [4 hrs]  creep , [4 hrs]  compression, [4 hrs]  bending , [4 hrs]  buckling , [4 hrs]  torsion [4 hrs]  sum. <math>4*8=32</math>  <b>TOTAL Structured SWL (h/sem)=84+32=116</b></p>	
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### 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 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	116	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	8
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	159	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	9
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	275		

### 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	Subject
1	Introduction to strength of materials
2	Simple stress and Strain
3	Compound Bars
4	Thermal stresses
5	Shearing force and bending moment diagrams
6	Bending of beam
7	Slope and deflection of beams
8	Shear stresses in beam
9	Torsion of shaft
10	Thin cylinders and shells
11	Complex stresses
12	Mohr's stress circle
13	Buckling of column
14	Strain Energy
15	Theories of Elastic failure
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>



### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week No.	Material vocabulary
1-2	Tensile
3-4	Torsion
5-6	Impact
7-8	Hardness
9-10	Effect of heat treatment on steel hardness
11-12	Bending
13-14	Compression
15	Buckling

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

Recommended Texts	<ol style="list-style-type: none"> <li>1. Mechanics of materials By Hearn</li> <li>2. Mechanics of materials By Dean Updike</li> <li>3. Mechanics of materials By R.C. Hibbeler</li> <li>4. Mechanics of materials By F.P. Beer</li> <li>5. Mechanics of materials By Goodno and Gere</li> </ol>	no
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## Grading Scheme

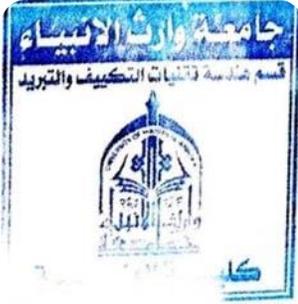
## مخطط الدرجات

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

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

استاذ المادة

التاريخ: ٢٠٢٥-٠٨-٣١



رئيس القسم

ا.م.د محمد حسن عبود

التاريخ: ٢٠٢٥-٠٨-٣١

