Ministry of Higher Education and Scientific Research - Iraq
Al-Mustaqbal University
College of Engineering
Department of Prosthetics and Orthotics Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	مقاومة موادI	Module Delivery
Module Type	CORE	☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	UOMU013032	
ECTS Credits	4	
SWL (hr/sem)	100	

Module Level	2	Semester of Delivery	3
Administering Department	UOMU013	**College**	UOMU01
Module Leader	Tayser Sumer Gaaz	**e-mail**	tayser.sumer.gaaz@uomus.edu.iq
Module Leader's Acad. Title	Asst. Prof. Dr.	**Module Leader's Qualification**	PhD.
Module Tutor			
Peer Reviewer Name		**e-mail**	
Review Committee Approval	01/06/2023	**Version Number**	1.0

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of materials theory through the application of techniques. 2. To understand the relation between the forces and the stresses. 3. This course deals with the basic concept of stresses and strains. 4. This is the basic subject for all types of determinate structures. 5. To understand the methods of solving stresses, strains, and deflections problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how determinate structures works under various types of loading. 2. List the various loading associated with determinate structures. 3. Summarize what is meant by a stresses and strains. 4. Describe the stress, the strains and the deflection. 5. Define Hook's law. 6. Identify the basic structural elements and their applications. 7. Discuss the operations of sinusoid and phasors in an electric circuit. 8. Discuss the various properties of beams, columns.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: **Fundamental Principles of Mechanic:** Concept of force, units of force (SI units), Moment of force, conditions of equilibrium **Forces and Moments:** Differential equilibrium relationship, Shear force and bending moment diagrams. **Stresses:** Concept of stresses, Stresses due to axial stress, Average shearing stress, Thin-walled pressure vessels. **Stresses in beams:** Bending stresses, Shearing stresses, Compound stresses **Strains:** Definition, Hook,s Low, Poisson,s ratio, Thermal strain, Stress-strain diagram, Linear relation between E,G and V. **Transformation of stress and strain:** Equation for the transportation of plane stress, Principal stress, Mohr,s Circle of stress, Equations for transportation of plane strain Mohr,s Circle of stress. **Torsion:** The torsion formula for solid circular shaft, Design of circular members in torsion, Angle of twist of circular members in torsion, Thin- walled hollow members, Solid non-circular sections. **Deflection of Beams:** Governing differential equation for deflection of elastic beam, Double Integration method, Moment area method. **Columns:** Natural of the beam column problem, Euler buckling load

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	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 that are interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
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.	2	10% (10)	12	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2hr.	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (60)	16	All
Total assessment			100% (100 Marks)		

<table>
<tr><td colspan="2">Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري</td></tr>
<tr><td></td><td>Material Covered</td></tr>
<tr><td>Week 1</td><td>Fundamental principles of Strength of materials: Concept of stress, units of stress (SI units).</td></tr>
<tr><td>Week 2</td><td>Stresses: Concept of stresses, Stresses due to axial stress.</td></tr>
<tr><td>Week 3</td><td>Stresses: Stresses due to axial stress.</td></tr>
<tr><td>Week 4</td><td>Stresses: Average shearing stress, Thin-walled pressure vessels.</td></tr>
<tr><td>Week 5</td><td>Stresses: Average shearing stress, Thin-walled pressure vessels.</td></tr>
<tr><td>Week 6</td><td>Strain: Definition, Hook,s Low, Poisson ,s ratio.</td></tr>
<tr><td>Week 7</td><td>Strain: Thermal strain.</td></tr>
<tr><td>Week 8</td><td>Strain: Stress-strain diagram.</td></tr>
<tr><td>Week 9</td><td>Strain: Linear relation between E,G and V</td></tr>
<tr><td>Week 10</td><td>Torsion: The torsion formula for solid circular shaft, Design of circular members in torsion</td></tr>
<tr><td>Week 11</td><td>Torsion: Angle of twist of circular members in torsion.</td></tr>
<tr><td>Week 12</td><td>Torsion: Thin- walled hollow members, Solid non-circular</td></tr>
<tr><td>Week 13</td><td>Stresses in beam: Bending stresses</td></tr>
<tr><td>Week 14</td><td>Stresses in beam: Shearing stresses.</td></tr>
<tr><td>Week 15</td><td>Stresses in beam: Compound stresses.</td></tr>
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<tr><td colspan="3">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td>Text</td><td>Available in the Library?</td></tr>
<tr><td>Required Texts</td><td>Strength of Materials, by: Singer.</td><td>yes</td></tr>
<tr><td>Recommended Texts</td><td>Introduction to Mechanics of Solid, by: E. Popov.

Elements of Strength of Materials, by: Timoshenko

Mechanics of Materials by: Russell C. Hibbeler.

Mechanics of materials by: Ferdinand Beer et al.

Mechanics of Materials by: Manua Gere.

Strength of Materials, J. P. Den Hartog</td><td>yes</td></tr>
<tr><td>Websites</td><td></td><td></td></tr>
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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:				

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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي