

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Mechanics</b>		Module Delivery
Module Type	<b>Support</b>		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>MIET 1203</b>		
ECTS Credits	<b>4</b>		
SWL (hr/sem)	<b>100</b>		
Module Level	UGI	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Abbas Sheyaa Alwan	e-mail	Abbas_sheyaa@mtu.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Dr. Ghaidaa Abdulrahman Khalid	e-mail	ghaidaakhalid@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	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

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. To understand mechanics theory through the application of motion.</li><li>2. To determine the forces, stress and strain under force effected.</li><li>3. To determine the reaction forces under load applied.</li><li>4. To understand the friction basic under mechanic applied</li><li>5. To understand the newton laws in motion.</li><li>6. To understand and solve problems in forces analysis.</li><li>7. To determine the materials properties and selective of materials.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Identifying the basic of forces results in applications of structures.</li><li>2. Identify the basics of Equilibrium force system.</li><li>3. Recognize how phenomena motion in mechanic's subject.</li><li>4. Summarize what is mean of forces reaction in beams.</li><li>5. Explain the analysis force in mechanics application.</li><li>6. Identify the basics of stress and strain in mechanical applications.</li><li>7. List the various parameters associated with mechanics theory.</li><li>8. Identify the basics of forces analysis and their applications.</li><li>9. Explain the Newton's laws used in mechanics application.</li><li>10. Identify the basics of friction forces in motion.</li><li>11. Identify the basics of welding and riveted joints in mechanical applications.</li><li>12. Explain the mechanical test to determine the mechanical properties.</li><li>13. Discuss the phenomena of moment of forces under different force moment.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A :</u></p> <ol style="list-style-type: none"><li>1- Introduction of forces, Analysis of Forces, Result of forces, Moment of forces, Equilibrium force system. [5 hrs]</li><li>2- Stress, Strain, stress – strain curve, Simple strain, Variable stress. [6 hrs]</li><li>3- Beams and bending, Analysis of structure. [5 hrs]</li><li>4- Friction, coefficient of friction, mechanism of friction. [5 hrs]</li></ol> <p><u>Part B:</u></p>

	<p>1- Materials properties, material selective, stress- strain diagram. [5 hrs]</p> <p>2- Mechanical tensile test, compression test, impact test, hardness test. [5 hrs]</p> <p>3- Mechanical joint, Rivet joint, welding connection. [5 hrs]</p> <p>4- Beams and bending, Analysis of structure, Centroid, Second moment of area. [7 hrs]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>Strategies in mechanical subject like:</p> <p>The main strategy that will be adopted in delivering this module is to encourage students to participate in the exercises, while at the same time refining and expanding their mechanical subject thinking development 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 SSWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3
<b>Unstructured USWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	<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	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 12	LO #1, 2, 10 and 11
	Online Assignments	2	10% (10)	5,9	LO # 3, 4, 6 and 7
	OnSite assignment	2	10% (10)	6, 10	LO # 5, 6, 8 and 9
	Report	1	10% (10)	14	LO # 2-10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1:	<ul style="list-style-type: none"> <li>Introduction to Engineering Mechanics</li> <li>Basic Concepts and Definitions</li> </ul>
Week 2:	<b>Introduction to Statics and Vectors (Part 1)</b> <ul style="list-style-type: none"> <li>Course introduction, syllabus, and importance of Statics.</li> <li>Fundamentals of forces, types of forces.</li> <li>Scalars and vectors.</li> <li>Vector addition and subtraction.</li> <li>Vector components and unit vectors.</li> </ul>
Week 3:	
Week 4:	
Week 5:	<b>Introduction to Statics and Vectors (Part 2)</b> <ul style="list-style-type: none"> <li>Resultant of force systems (graphical method).</li> <li>Resultant of force systems (analytical method).</li> <li>Moments of forces (torque).</li> <li>Conditions for equilibrium.</li> <li>Free-body diagrams and solving equilibrium problems.</li> </ul>
Week 6:	
Week 7:	<b>Stress, Strain, and Material Properties (Part 1)</b> <ul style="list-style-type: none"> <li>Stress and types of stress.</li> <li>Strain and types of strain.</li> <li>Hooke's Law and material properties.</li> <li>Stress-strain diagrams.</li> <li>Thermal stress and strain.</li> </ul>
Week 8:	
Week 9:	<b>Stress, Strain, and Material Properties (Part 2)</b> <ul style="list-style-type: none"> <li>Simple strain and deformation.</li> <li>Stress and strain transformations.</li> <li>Shear and axial deformation.</li> <li>Review and applications of stress and strain.</li> <li>Assignment on stress and strain analysis.</li> </ul>
Week 10:	

<b>Week 11:</b>	<b>Second Moment of Area and Structural Analysis (Part 1)</b> <ul style="list-style-type: none"> <li>• Geometric properties of shapes.</li> <li>• Centroids and center of mass.</li> </ul>
<b>Week 12:</b>	
<b>Week 13:</b>	<b>Second Moment of Area and Structural Analysis (Part 2)</b> <ul style="list-style-type: none"> <li>• Second moment of area (moment of inertia).</li> <li>• Bending stress in beams.</li> <li>• Shear stress in beams.</li> </ul>
<b>Week 14:</b>	<b>Friction</b> <ul style="list-style-type: none"> <li>• Shear and moment diagrams.</li> <li>• Introduction to beams and types of loads.</li> <li>• Determining reactions in statically determinate structures.</li> <li>• Truss analysis.</li> <li>• Frame analysis.</li> </ul> <b>Stress Concentration, Fatigue, and Special Topics</b> <ul style="list-style-type: none"> <li>• Friction coefficient</li> <li>• Type of friction</li> <li>• Mechanism of friction.</li> <li>• Review of special topics.</li> <li>• Comprehensive review of the course material.</li> <li>• Final exam or project presentations.</li> </ul> Course evaluation and feedback.
<b>Week 15:</b>	Preparatory week before the final Exam

<b>Learning and Teaching Resources</b>		
مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	1- Engineering Mechanic's Statics, 12th Edition by R. C. Nibbler, 1995.	Yes
<b>Recommended Texts</b>	2- Engineering Mechanic's Statics, 7th Edition by James, L. Meriam, L. G Kraige, 1995.	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

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