

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Engineering Mechanics 1		Module Delivery	
Module Type	Core learning activity		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	CE101			
ECTS Credits	7			
SSWL (hr/sem)	93			
USSWL (hr/sem)	82			
SWL (hr/sem)	175			
Module Level	1	Semester of Delivery		1
Administering Department	CE	College	GE	
Module Leader	Hatem.khaleefah		e-mail	Hatem.khaleefah@alnaji.uni.edu.iq
Module Leader's Acad. Title	Professor Lecturer		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	Hatem.khaleefah@alnaji.uni.edu.iq
Scientific Committee Approval Date			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 Objectives أهداف المادة الدراسية	Statics: 1. To give a statement of Newton's Laws of Motion and Gravitation. 2. To review the principles for applying the SI system of units. 3. To resolve the forces into components 4. To show how to find the resultant different forces system. 5. To introduce the concept of the free-body diagram. 6. To discuss the concept of the moment of a force and show how to calculate it in two and three dimensions. 7. To provide a method for finding the moment of a force about a specified axis. 8. To define the moment of a couple. 9. To indicate how to reduce a simple distributed loading to a resultant force acting at a specified location. 10. To develop the equations of equilibrium for a rigid body 11. To introduce the concept of the free-body diagram for a rigid body. 12. To show how to solve rigid-body equilibrium problems using the equations of equilibrium. 13. To show how to determine the forces in the members of a truss using the method of joints and the method of sections. 14. To analyze the forces acting on the members of frames and machines composed of pin-connected members Dynamics: 15. To introduce the concepts of position, displacement, velocity, and acceleration. 16. To state Newton's Second Law of Motion and to define mass and weight. 17. To analyze the accelerated motion of a particle using the equation of motion with different coordinate systems. 18. To develop the principle of work and energy and apply it to solve problems that involve force, velocity, and displacement. 19. To develop the principle of linear impulse and momentum for a particle and apply it to solve problems that involve force, velocity, and time.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Cognitive goals: Static: Analyze forces and moments in two and three dimensions, Find out the resultant forces in two and three dimensions Draw free-body-diagram, Compute the reaction force in simple structure (beam, frame, truss) Dynamics:

	1. Understand the engineering applications that evolve dynamics. 2. Solve engineering problems involving objects moving along a linear path. 3. Simplify engineering problems involving objects moving along a curved path. 4. Recognize and deal with projectile problems. 5. Write the equation of motion of a moving object. 6. Solve problems involving the force in accelerated bodies.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Statics: Part A Introduction to mechanics (scalar quantities, vector quantities, units , resolution of the force in plane). (8hrs) Part B Resultant different forces system. (resultant of two perpendicular forces, resultant of non-perpendicular forces, resolution of the force in space, resultant of a concurrent, coplanar force system, resultant of a concurrent, non-coplanar force system, moment of a force, resultant of a non-concurrent, coplanar force system, resultant of a parallel coplanar force system, resultant of a parallel coplanar force system in space, examples). [12 hr.] Part C Equilibrium of a rigid body (Free body diagram F.B.D. types of supports, uniformly distributed load, internal forces, examples). [20 hr.] Part D Analysis of Trusses (definition, common types, internal forces, analysis of simple trusses, examples). [20 hr.] Dynamics: Part F Solve engineering problems involving objects moving along a linear path. Simplify engineering problems involving objects moving along a curved path. Recognize and deal with projectile problems. Write the equation of motion of a moving object. Midterm Exam (Dynamics) Solve problems involving the force in accelerated bodies. Apply the theorem of conservation of energy to solve kinetic problems. [30 hr.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main adopted strategy in delivering this module, encourage students' participation in the exercises, refining and expanding their critical thinking skills comprised: 1. Lectures. 2. Tutorials.

	3. Homework and Assignments. 4. Tests and Exams. 5. In-Class Questions and Discussions. 6. Connection between Theory and Application. 7. Extracurricular Activities. 8. In- and Out-Class oral conservations.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	3,5,7,10, 13 and 14	LO #1, #2 and #10, #11, #15 , #17, # 19
	Assignments	1	5% (5)	3,5,7,10, 13 and 14	LO #1, #2 and #10, #11, #15 , #17, # 19
	Projects / Lab.	1	10% (10)	13	All
	Report	1	5% (5)	14	All
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO #1 - #19
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to mechanics (scalar quantities, vector quantities, units).
Week 2	Introduction to mechanics (resolution of the force in plane). (8hrs) Resultant different forces system. (resultant of two perpendicular forces)
Week 3	Resultant different forces system. (resultant of non-perpendicular forces, resolution of the force in space, resultant of a concurrent, coplanar force system, , moment of a force).
Week 4	Resultant different forces system. (resultant of a non-concurrent, coplanar force system, resultant of a parallel coplanar force system, resultant of a parallel coplanar force system in space, examples). Equilibrium of a rigid body (Free body diagram F.B.D)
Week 5	Equilibrium of a rigid body (Free body diagram F.B.D. types of supports)
Week 6	Equilibrium of a rigid body (uniformly distributed load, internal forces).
Week 7	Equilibrium of a rigid body (examples). Analysis of Trusses (definition)
Week 8	Analysis of Trusses (common types, internal forces).
Week 9	Analysis of Trusses (analysis of simple trusses).
Week 10	Analysis of Trusses (examples).
Week 11	Midterm Exam (Statics) Solve engineering problems involving objects moving along a linear path.
Week 12	Simplify engineering problems involving objects moving along a curved path. Recognize and deal with projectile problems.
Week 13	Write the equation of motion of a moving object.
Week 14	Midterm Exam (Dynamics) Solve problems involving the force in accelerated bodies.
Week 15	Apply the theorem of conservation of energy to solve kinetic problems.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Engineering Mechanics STATICS 15th Edition in SI Units Hibbeler 2023	Yes
	2. ENGINEERING MECHANICS statics and DYNAMICS 14th EDITION HIBBELER 2016	yes
	3. solutions manual to Engineering Mechanics Statics 8th edition Meriam Kraige 2016	NO
	4. solutions manual to ENGINEERING MECHANICS statics and DYNAMICS 14th EDITION HIBBELER 2016	No
Recommended Texts	solutions manual to Engineering Mechanics Statics 8th edition Meriam Kraige 2016	No
Websites	https://en.m.wikipedia.org/wiki/Mechanics	

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.				