

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mechanics		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	EPE 105		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	EPE	College	E
Module Leader	AHMED M. KHADHIM	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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>Module Objectives أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. To develop problem solving skills and understanding principles of static and dynamic mechanics and principles of strength of material and their applications. 2. To understand the basic concepts of Statics: forces, moment of forces, Equilibrium, analysis of trusses, friction, centroids & center of gravity, moment of inertia: parallel Axes Theorem, 2nd moment of area by integration, principles of strength of material, tension & stress. 3. This course deals with the basic concepts of Dynamics: Kinetics of particle, motion types, normal and tangential component of Acceleration, kinetics: force, mass and acceleration, kinetics of particle Newton's 2nd law.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Enhancing problem solving in static mechanics including friction, truss, and equilibrium. 2. Enhancing students' analytical abilities by giving an introduction to the principles and basics of oscillatory motion, free vibrations, damped vibrations, forced vibrations, harmonic vibration, the critical speed of rotating shafts, systems of one, two, and multiple degrees of freedom. 3. Ability to use the equation of motion to find the natural frequency. 4. Developing skills in using the Lagrange and Rayleigh equation and the energy method to find the equation of motion. 5. The soft skills objectives of the course.

Indicative Contents

المحتويات الإرشادية

Indicative content includes the following.

Part A - Statics

Force system, unit system, parallelogram law, force components.

Moment of couples, Equilibrium: free body and coplanar system.

Analysis of trusses.

Friction nature of friction, theory of friction, coefficient of friction. [15 hrs].

Centroids & center of gravity, centroids of area Centroids determined by integration, moment of inertia

Parallel Axes Theorem, 2nd moment of area by integration

Moment of inertia of Composite area

Dynamics, Kinetics of particle. [10 hrs]

Part B - Dynamics

Kinetics of particle, Rectilinear motion, Curvilinear motion

Rectangular components of curvilinear motion

Normal and tangential component of Acceleration

kinetics: force, mass and acceleration

kinetics: force, mass and acceleration

kinetics of particle Newton's 2nd law

kinetics of particle Newton's 2nd law. [15 hrs]

Part C- Strength of Material.

Strength of Materials: Hooks law, tension and compression stress

Thin – walled cylinders and spheres

Combined stress (Mohr's circle) shear and normal stress

Stresses in beams (initial principal). [10 hrs]

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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<ul style="list-style-type: none"> ❖ Weekly lectures included Providing students with the basics and topics related to pre-skills education outcomes to solve practical problems through presentation, lecture or conducting experiments. ❖ Solving a group of practical and applied examples by the academic staff. ❖ Through discussion, students participate in solving some practical problems. ❖ The department's practical laboratories are monitored by the department's academic staff. ❖ Asking the student to visit the library and the international information network (the Internet) to obtain additional knowledge of the study subjects. <p>Presenting a seminar (Seminar) by a student in front of his fellow students to enhance his confidence.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects/seminar	1	10% (10)	Continuous	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% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Force system, unit system, parallelogram law, force + components. Moment of couples, Equilibrium: free body diagram, coplanar system
Week 2	Analysis of trusses
Week 3	Friction nature of friction, theory of friction, coefficient of friction
Week 4	Centurions & center of gravity, centurions of area
Week 5	Centurions determined by integration, moment of inertia

Week 6	Parallel Axes Theorem, 2nd moment of area by integration
Week 7	Curvilinear motion Rectangular components of curvilinear motion
Week 8	Normal and tangential component of Acceleration
Week 9	kinetics: force, mass and acceleration
Week 10	kinetics: force, mass and acceleration
Week 11	kinetics of particle Newton's 2nd law
Week 12	kinetics of particle Newton's 2nd law
Week 13	Strength of Materials: Hooks law, tension and compression stress
Week 14	Thin – walled cylinders and spheres
Week 15	Stresses in beams (initial principal)
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering Mechanics By Higdon	Yes
Recommended Texts	Engineering Mechanics By Meriam	Yes
Websites	https://www.coursera.org/browse/mechanical_engineering	

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.