MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Strength of Materials**			**Module Delivery**	
Module Type	**Support learning activities**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ATU12044**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level			**Semester of Delivery**	4	
Administering Department	ATU12		**College**	PMTEC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	MS.C	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/02/2024		**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	In this course, the student will be able to understand the basic meaning of different types of engineering stresses and strains. The student will learn the equations and formulas necessary to analyze the stresses in engineering structures and also will be able to draw the shear force diagram and bending moment diagrams which can make the student more familiar with engineering problems. Moreover, the student will be able to draw the stress-strain diagram for both the ductile and brittle materials and define the various regions of the curve.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learn the different types of engineering stresses 2. Recognize the various types of engineering strains. 3. Deal with thermal stress problems. 4. Using the superposition method and saint venant equations to solve stress problems. 5. Define the mechanical properties of ductile and brittle materials. 6. Analyze the loads on engineering structures by drawing the shear force and bending moment diagrams 7. Discuss the symmetrical and unsymmetrical bending moment. 8. Draw the mohr circle for compound stresses.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Stresses and strains Engineering stresses and strains, Poisson ratio , Hook law, tensile test for materials. [20 hrs] Part B – thermal stresses, superposition method and saint venant method (20hrs) Part C- Mechanical Properties of materials (20hrs). Part C- Shear force diagram and bending moment diagram [20 hrs] Part D- symmetrical and unsymmetrical bending moments [20hrs] Part E-Pressure vessels [8 hrs]

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 and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #3, #4 and #9, #10
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
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 1-2	Stress and Strain -Study and analysis of simple stress and simple strain
Week 3	Material Behavior-Study the behavior of material under load (tensile test)
Week 4	Hooke's Law To know where the Hooke's law apply
Week 5	Thermal Strain and Stress Study the strain and stress induced due to temperature changes -Solve statically indeterminate problems due to temperature changes
Week 6	Pressure Vessels-Stresses in pressure vessels
Week7	Torsion of Circular Shaft Study the pure torsion for solid and hollow circular shafts-Study the stress induced due to torsion -Study the angular deformation induced due to torsion
Week 8	Mid-term Exam
Week 9-10	Beams: Shear force and Bending Moment-Introduction to beams and loading types and the resulted shear and moment
Week 11-12	Mohr's Circle-Graphical representation of stress at a point using Mohr's circle -Systematic procedure of graphical representation of stresses at a point using Mohr's circle
Week 13-14	Symmetrical and unsymmetrical bending moments,
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Tension Test
Week 3-4	Compression Test
Week 5-6	Hardness Test

Week 6-7	Impact Test
Week 8-9	Bending Test
Week 10-11	Heat Treatment
Week 12-13	Torsion Test
Week 14-15	Fatigue Test

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Mechanics of Materials R.C Hibbler	Yes
Recommended Texts	Mechanics of Materials E J Hearn	No
Websites		

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.