The University of Jordan School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Strength of Materials I	0934372	

2019 Course Catalog Description

Axial loading, Material properties obtained from tensile tests, Stresses and strains due to axial loading, Thermal Stresses, Elementary theory of torsion, Solid and hollow shafts, Thin-walled tubes, Rectangular cross-section, Stresses in beams due to bending, shear and combined forces. Composite beams, Analysis of plane stress, Mohr's Circle, Combined stresses, Thin-walled pressure vessels, Deflection of beams, Buckling of columns, Energy Methods.

			Instr	uctors				
Name			E-mail	Sec	C	Office Hours	Lecture Time	
			Text	Books				
			Text book 1			Text book 2		
Title		Mecha	nics of Materials					
Author(s)		J. Ger	e& B. Goodno					
Publisher, Year, Edition C			ge Learning, 2013, E	ighth-Edit	ion			
			Refe	rences				
Books	1. R. C.	Hibbeler,	"Mechanics of Materia	ıls",				
2. F. P. Beer, and E. R. Johnston, "Mechanics of Materials						, McGraw Hill.		
		Kraige, "Mechanics of Materials", John Wiley and Sons.						
			chanics of Materials", P					
Journals	1 0		. 11223:Strength of Ma					
Internet links	http://web.mst.edu/~mecmovie/, http://fetweb.ju.edu.jo/ME/Courses/Mechmovies/							
Prerequisites								
Prerequisites by	y topic	-						
Prerequisites by	y course	Statics(0901241) or Dynamics (0904220)						
Co-requisites b	y course							
Prerequisite for	r	Applied Mechanics Lab. (1), Manufacturing Processes (0906310), Machine Design (1)						
		(0904435), Design of Machine Elements (0904437), Strength of Materials (2) (0904472),						
		Failure and Fracture Analysis (0904481), Computer-Aided Design (0904484), Engineering Computational Software (0904522), Introduction to Composite Materials (0904581).						
		Comput	ational Software (09045	522), Introd	luction t	to Composite Mate	erials (0904581).	

Topics Covered

Week	Topics	Chapter in Text	Sections
1	Introduction: Concept of stress and strain at a point of a stressed	Chapter 1	1.1, 1.2
	body, Basic loadings: tension, compression, shearing and bearing.		
2-3	Stress-strain diagram and mechanical behavior of the material,	Chapter 1	1.3 - 1.7
	Allowable values of influences and responses and Factors of safety.		
4-5	Axially loaded members: Deformation, Normal stresses and normal	Chapter 2	2.1 - 2.4
	strains, Shear stresses.		
5	Thermal stresses, Stresses on inclined planes.	Chapter 2	2.5, 2.6
6	Torsion: Pure shear and Transmission of power by circular shafts	Chapter 3	3.1 - 3.8
7-8	Shear force and bending moment diagrams.	Chapter 4	4.1 - 4.5
9-10	Elementary flexure theory of beams: stresses in beams: Assumptions	Chapter 5	5.1-5.6, 5.8, 5.10-8.12
	and basic concepts, Curvature, Normal strains and stresses, Shear		
	stresses in beams.		

					equations of pla		Chapter 7	7.1-7	7.5
				es: Principal stresses and maximum shear plane stresses.					
13	Pressure vessels and combined loading: Cylindrical and spherical vessels analysis; Combined loading analysis in beams.					Chapter 8	8.1-8	3.5	
14	Beam deflection using integration method and other methods					Chapter 9	9.1-9	9.4	
15	Buckli				tical load and Co		Chapter 11	11.1	-9.3
	modes		Mannina	of Course	Outcomes	A DET C4	and Outon		
SOs	Mapping of Course Outcomes to ABET Student Outcomes Course Outcomes								
БОБ	Course Outcomes 1. An ability to apply knowledge of calculus and differential equations in derivation of some basic equation							sic equations of	
1	strength of materials. 2. Understand mechanical behavior of the material and interpret data to draw Stress-Strain diagram.								
									cam. ined loading and
					ns on inclined se			and comb	med loading and
2	4. Ana	lyze sh	ear stresses					l maximum	shear stresses by
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				shear stresse		, and diffi W	moa probbate (coor anou,	5 companing the
	6. Ana	lyze be	ams deflection	on and buckl	ing using differe	ent methods.			
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Assign	nments								20 %
Final Exam					50 %				
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