FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Stress Analysis

Information :

Course Code :	MAN 232	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Department of Petroleum Engineering

Instructor Information :

Title	Name	Office hours
Professor	Mohamed Tarek Ibrahim Mohamed Ali Elwakad	2
Teaching Assistant	Ahmed Ibrahim Sadek Mostafa Elgindy	1

Area Of Study :

Understand and analyze the various loads and stresses acting on the mechanical structures.
know the strains, deformations, slopes and deflections of the mechanical structure
analyze the internal forces for statically indeterminate beams.

Description :

Equilibrium, Continuity, Material mechanical behavior, Normal force, Shearing force, Bending and twisting moment diagrams, Stresses in simply loaded elastic bars: axial loading, bending and torsion, deformation, stiffness, strain Energy, Stresses in elastic and elasto-plastic bars, Residual stresses. Combined loading, Eccentric normal load, Oblique bending: combined bending and torsion, Twodimensional stresses, Principal stresses, Maximum shear stress, Allowable stresses, Mohr's circle representation, Application to some simple frames, Thinvessels, Springs, Load and displacement measurement.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Understand the various loads and stresses acting on the mechanical structures.
2 -	Understand the internal forces for statically indeterminate beams
3 -	Understand the strains, deformations, slopes and deflections of the mechanical structures.
b.Intellectual Skills: :	
1 -	Analyze the various loads and stresses acting on the mechanical structures.
2 -	Analyze the internal forces for statically indeterminate beams.
3 -	Determine the strains, deformations, slopes and deflections of the mechanical structures.
c.Professional and Practical Skills: :	
1 -	Apply knowledge of mathematics, science, information technology, design, engineering practice integrally to solve engineering problems.

d.General and Transferable Skills: :	
1 -	Deal with others according to the rules of professional ethic.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Properties of areas	5	3	2
Elastic behavior of simple elements under axial loading	10	6	4
Elastic behavior of simple elements under bending loading	10	6	4
Elastic behavior of simple elements under twisting loading	10	6	4
Combined stresses and Mohr's circle	10	6	4
Principal stresses	10	6	4
Beam deflection	10	6	4
Statically indeterminate beams	10	6	4

Teaching And Learning Methodologies :

Interactive Lecturing
Discussion
Problem Solving

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignment	10.00		
Final Exam	40.00		
Mid- Exam	30.00		
Participation	10.00		
Quizzes	10.00		

Recommended books :

1- Beer,F.B. & Johnston,E.R. "Mechanics of Materials" , McGraw-Hill Book Company, 2008.
2- Popov,E.P., "Mechanics of Materials" , Prentice Hall Int., London, 2007.
3- Dobrovolsky, Machine elements, MIR Publisher Co. 2007.