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 :

1- To Understand and analyze the various loads and stresses acting on the mechanical structures.
2- To know the strains, deformations, slopes and deflections of the mechanical structure
3- To 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, Two-dimensional stresses, Principal stresses, Maximum shear stress, Allowable stresses, Mohr's circle representation, Application to some simple frames, Thin-vessels, 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.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Properties of areas			
Elastic behavior of simple elements under axial loading			

Course Topic And Contents :			
Topic	**No. of hours**	**Lecture**	**Tutorial / Practical**
Elastic behavior of simple elements under bending loading			
Elastic behavior of simple elements under twisting loading			
Combined stresses and Mohr's circle			
Principal stresses			
Beam deflection			
Statically indeterminate beams			

Teaching And Learning Methodologies :
Interactive Lecturing
Discussion
Problem Solving

Course Notes :
Handout lecture Notes (Prof. Hesham Sonbol)

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.