

Faculty of Engineering & Technology

Stress Analysis

Information :

Course Code : MAN 232

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Department of Mechanical Engineering

Instructor Information :

Title	Name	Office hours
Professor	Mohamed Tarek Ibrahim Mohamed Ali Elwakad	2
Lecturer	Arafa Soliman Sobh Khalil Arafa	1
Teaching Assistant	Eman Mohamed Hammad Ahmed	
Teaching Assistant	Ahmed Ibrahim Sadek Mostafa Elgindy	

Area Of Study :

1. Develop engineering ability and analyze a given mechanical elements under different stresses.
2. Discuss problem in a simple and logical manner and to apply its solution a few fundamental and well-understood principles of stress analysis.

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 - Identify the principles of design including elements stress analysis
- 2 - Define the characteristics of stress analysis related to mechanical production engineering

b. Intellectual Skills: :

- 1 - Analyze and interpret data, and design experiments to obtain primary data
- 2 - Classify numerical data and apply analytical methods for engineering design purposes
- 3 - Think in a creative and innovative way in stress and strain problem solving and design

c. Professional and Practical Skills: :

- 1 - Explain a component or system, and carry out stress analysis problems.
- 2 - Analyze knowledge of science, information technology, design, and engineering practice to solve stress problems

d.General and Transferable Skills: :

1 -	Introduce ideas and solutions for many practical and engineering problems efficiently in predetermined time plan.
2 -	Use digital libraries and/or Learning systems

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
bending moment diagram, Normal stress	12	6	6
Shear stress & Torsional Stress	10	6	4
Combined stress	8	4	4
Principal stresses, , Allowable stresses	4	2	2
Maximum shear stress	4	2	2
Reactions & Normal force diagram, Shear force diagram	8	4	4
Mohr's circle representation	4	2	2
Project follow -up.	4	2	2
Midterm Exams ,Quizzes	6	2	4

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Discussion

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments, Participation, & Quizzes	20.00		Reports follow up during tut. /lab work, & written exam
Final Exam	40.00	14	Written Exam
Mid-term Exams	30.00		Written Exam
Project.	10.00	12	Practical

Course Notes :

Lecture notes on the course moodle page, FUE website.