

Mechanics of Solids-II

Course Code CE-205	Credit Hours 2-1
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Course Description

This subject is designed to cover the structural computations of load and stresses on a member when subjected to different loading conditions. Mainly it covers the basic analysis of structural members like beams and columns

Text Book:

1. Mechanics of Materials by J.M.Gere 7th Edition
2. Strength of materials by S.P Timoshenko
3. Advanced Mechanics Of Materials By Arthur P. Boresi

Reference Book:

Prerequisites :

CE-103 Mechanics of Solids-I.

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

Teaching Plan

Week No	Topics/Learning Outcomes
1-2	<ul style="list-style-type: none">• Introduction to Combined Stresses (normal, shear stresses - practical cases)• Stresses due to Axial Loading and Flexural Loading

	<ul style="list-style-type: none"> Members subject to Normal and Shear stresses
2-5	<ul style="list-style-type: none"> Stresses on Inclined Planes Principal Stresses, Principal Planes, and Maximum Shear Stress (Transformation Equations) Mohr's Circle (for plain stress problems), and measuring of maximum stresses, principal stresses and their plane Mohr's circle for Maximum shear stress Mohr's Circle for Plane Strain problems
6	<ul style="list-style-type: none"> Strain Gauge and Strain Rosettes Relationship between Modulus of Elasticity (E) and Modulus of Rigidity (G), elastic constants
7-8	Theories of Failure (and their applications) <ol style="list-style-type: none"> Maximum Stress Theory Tresca Theory (Max Shear Stress Theory) Maximum Strain Theory Maximum Strain Energy Theory Von Mises or Mises Yield Theory Mohr-Coulomb Theory
9	Mid Semester Exam
10-13	Unsymmetrical Bending in practical cases <ol style="list-style-type: none"> Skew loading Unsymmetrical Cross Section
14-15	Thin and Thick Cylinders <ul style="list-style-type: none"> Circumferential and Longitudinal Stresses in Thin Cylinders Stresses in Spherical Shells Stresses in Thick Cylinders
16	Eccentrically Loaded Short Columns <ul style="list-style-type: none"> Response of short Eccentrically Loaded Columns about one axis and two axes Use of secant formula
17-18	End Semester Exam

Practical

Experiment No	Description
1	To determine the tensile strength of a steel bar
2	To determine the deflected shape of struts under different end

	conditions
3	To determine the compressive strength of concrete specimen
4	To determine the I_{xx} and I_{yy} of a beam under unsymmetrical bending