

CE 201 MECHANICS OF SOLIDS

<i>Course Plan</i>			
Module	Contents	Hours	Sem. Exam Marks
I	Review of Statics Types of external loads - internal stresses - normal and shear stresses - strain - Hooke's law - working stress - stress strain diagrams - Poisson's ratio - relationship between elastic constants	9	15%
II	Elongation of bars of constant and varying sections – statically indeterminate problems in tension and compression – Temperature effects – strain energy and complementary energy-strain energy due to tension, compression and shear	9	15%
FIRST INTERNAL EXAMINATION			
III	Bending Moment & Shear force: Different types of beams-various types of loading –Relationship connecting intensity of loading , shearing force and bending moment- shear force and bending moment diagrams for cantilever beams and Simply supported beams for different types of loading.	9	15%
IV	Stresses in beams of symmetrical cross sections: Theory of simple bending –assumptions and limitations – Normal stresses in beams- Moment of resistance - beams of uniform strength - beams of two materials – strain energy due to bending - shearing stresses in beams.	9	15%
SECOND INTERNAL EXAMINATION			
V	Analysis of stress and strain on oblique sections: Stress on inclined planes for axial and biaxial stress fields - principal stresses - Mohr's circle of stress Thin and Thick Cylinders: Stresses in thin cylinders – thick cylinders - Lamé's equation – stresses in thick cylinders due to internal and external pressures Torsion: Torsion of solid and hollow circular shafts.-Pure shear- strain energy in pure shear and torsion. Springs: Close coiled and open coiled helical springs.	9	20%
VI	Deflection of statically determinate beams: Differential equation of the elastic curve - Method of successive integration, Macaulay's method, Method of superposition, moment area method. Theory of columns: Direct and bending stresses in short columns- Kern of a section. Buckling and stability-Euler's buckling/crippling load for columns with different end conditions- Rankine's formula	11	20%
END SEMESTER EXAM			