

# **Gautam Buddha University, Greater Noida**

## **School of Engineering (Mechanical Engineering)**

<b>Degree</b>	<b>Course Name</b>	<b>Course Code</b>	<b>Marks:100</b>
Integrated B. Tech. + M. Tech. / M.B.A.	Mechanics of Materials - II	ME 305	SM+MT+ET 25+25+50
<b>Semester</b>	<b>Credits</b>	<b>L-T-P</b>	<b>Exam.</b>
V	3	2-1-0	3 Hours

### **Unit - I**

**Unsymmetrical Bending:** Properties of beam cross section; Product of inertia; ellipse of inertia; Slope of the neutral axis; Stresses & deflections; Shear centre and the flexural axis; Problems. **(05 Hours)**

### **Unit - II**

**Fixed Beams:** Deflections, reactions and fixing moments with SF & BM calculations & diagrams for fixed beams under (i) concentrated loads, (ii) uniformly distributed load and (iii) a combination of concentrated loads & uniformly distributed load. Problems. **(05 Hours)**

### **Unit - III**

**Thick Cylinders & Spheres:** Derivation of Lamé's equations; Radial & hoop stresses and strains in thick and compound cylinders and spherical shells subjected to internal fluid pressure only; Wire wound cylinders; Hub shrunk on solid shaft; Problems. **(05 Hours)**

### **Unit - IV**

**Rotating Rims & Discs:** Stresses in uniform rotating rings & discs; Rotating discs of uniform strength; Stresses in (i) Rotating rims; neglecting the effect of spokes; (ii) Rotating cylinders; Hollow cylinders & solid cylinders; Problems. **(05 Hours)**

## **Unit - V**

**Bending of Curved Beams:** Stresses in curved beams of initial large radius of curvature; Beams of initial small radius of curvature; Stresses in crane hooks; Rings of circular & trapezoidal sections; Deflection of curved beams & rings; Deflection of rings by Castigliano's theorem; Stresses in simple chain link; Deflection of simple chain links; Problems. **(05 Hours)**

## **Unit - VI**

**Springs:** Stresses in open coiled helical spring subjected to axial loads and twisting couples; Leaf springs; Flat spiral springs; Concentric springs; Problems. **(05 Hours)**

### **Recommended Books:**

1. Strength of Materials; G. H. Ryder; Third Edition in SI Units 1969 Macmillan; India.
2. Mechanics of Materials (Metric Edition); Ferdinand P. Beer and E. Russell Johnston; Jr. Second Edition; McGraw Hill.
3. Solid Mechanics; S. M. A. Kazmi; Tata McGraw Hill
4. Strength of Materials; D. S. Bedi; S. Chand & Co. Ltd.
5. Advanced Mechanics of Solids and Structures; N. Krishan Raju and D. R. Gururaje; Narosa Publishing House.
6. Strength of Materials; Andrew Pytel and Ferdinand L. Singer Fourth Edition; Int. Student Ed. Addison; Wesley Longman.