ME206 Mechanics of Solids

Credit: 3-0-0-3 **Approval: Approved in 3rd Senate**

Prerequisite: Consent of the faculty member

Students intended for: Undergraduate

Elective or Core: Core Semester: Odd/Even

Course objective: The aim of this course is to expose students to various processes and stages in the design and development of a product

Course content:

- Free body diagram, Conditions for equipment: statically determinate & indeterminate
- Mechanics of small deformation: Geometric compatibility & force deformation law (for uniaxial loads
- Special kinds of load: Transverse loaded slender member : Sheer force & Bending moment
- Stress and Strain: Proper definition of stress and stain
- Theory of yielding
- Shaft : Circular cross-section shaft under uniform & varying load (torque), Twisting deformation of shaft
- Bending Stresses
- Deflection of Beam (superposition theorem), Castigliani-II theorem: Energy method (unit load method)
- Bucking of column (Brief discussion in the context of elastic instability)

Suggested Books

Timoshenko S. P., and Gere J. M., Mechanics of Materials, 2nd Ed., CBS Publishers, 2002.

Crandall S. H., Dahl N. C., and Lardner T. J., An Introduction to the Mechanics of Solids, 2nd Ed., McGraw-Hill, 1999

Hearn E. J., Mechanics of Materials, 3rd Ed., Pergamon, 2003.

Higdon A., Ohslen E. H., Stiles W. B., Weese J. A., and Riley W. F., Mechanics of Materials, John Wiley & Sons, 1989

Popov E. P., Nagarajan S., and Lu Z. A., Mechanics of Materials, 2nd Ed., Prentice-Hall of India, 2002.