Mechanics (ME10001)
Suggested Reading Materials
Post Mid-Semester Examination: Strength of Materials

BJ - Beer, Johnston, Mazurek, Cornwell and Sanghi, Vector Mechanics for Engineers, 10th Edition in SI Units, McGraw Hill Education (India) Pvt. Ltd.

MK – Meriam and Kraige, Engineering Mechanics – Statics, 7th Edition, Wiley India.

BJS – Beer, Johnston and DeWolf, Mechanics of Materials, 6th Edition (in SI units), Tata McGraw-Hill Publishing Company Ltd.

P – Popov, Engineering Mechanics of Solids, 2nd Edition, PHI Learning Pvt. Ltd.

Properties of areas:
- First moment of area – BJ(5.3, 5.4 5.5) or MK(5/3, 5/4)
- Second moment of area and polar moment of area – BJ(9.2 to 9.7) or MK(Appendix A/2, A/3)
- Pappus-Guldinus theorem – BJ(5.7) or MK(5/5)

Concept of stress and strain:
- Normal stress – BJS(1.3 to 1.5) or P(1.6)
- Shear stress – BJS(1.6) or P(1.8)
- Bearing Stress – BJS(1.7)
- State of stress at a point – BJS (1.11, 1.12) or P(1.3, 1.4)
- Ultimate strength, allowable stress and factor of safety – BJ(1.13) or P(1.10, 1.11)
- Normal strain – BJS(2.2) or P(2.2)
- Shear strain – BJS(2.14) or P(5.2)
- Hooke's law – BJS(2.3 to 2.5) or P(2.3 to 2.5)
- Poisson's ratio – BJS(2.11) or P(2.6)
- Generalized Hooke's law – BJS(2.12, 2.15) or P(5.6, 5.7)
- Analysis of axially loaded members – BJS(2.8) or P(3.2)
- Simple applications in design – BJS(1.8) or P(1.6, 1.7)

Application:
- Thin pressure vessels – BJS(7.9) or P(5.9)

Transformation of stress:
- Transformation of stress – BJS(7.2) or P(11.2, 11.3)
- Principal stress and maximum shear stress – BJS(7.3) or P(11.4, 11.5)
- Mohr's circle for plane stress – BJS (7.4) or P(11.6)

Torsion
- Torsional stress in cylindrical bars and deformation – BJS(3.1 to 3.5) or P(6.3 to 6.6)

Flexural loading:
- Shear force and bending moment in beam – BJS(5.3, 5.3) or P(7.8 to 7.11)
- Flexure formula – BJS(4.2 to 4.4) or P(8.3, 8.5)
- Differential equation of elastic curve and beam deflection – BJS(9.1 to 9.4) or P(14.2 to 14.7)