Topics

1. Transformation of stress and strain (11 hours)……..….Exercise-1 (30 points)
    - Transformation of plane stress
    - Principal stresses and maximum shearing stress
    - Mohr's circle
    - General state of stress
    - Transformation of plane strain and Mohr's circle
    - Three dimensional analysis of strain
    - Measurements of strain
2. Bending of curved members (3 hours)……..……..…Exercise-2 (10 points)
3. Thin-walled pressure vessels (3 hours)……..……...….Exercise-3 (10 points)

Midterm (400 points)

4. Columns (7 hours)...……...…..…….……Exercise-4 (30 points)
    - Stability of structures
    - Euler's formula
    - Eccentric loading and the secant formula
5. Concept of energy and application (6 hours)……...…. Exercise-5 (30 points)
    - Strain energy and strain energy density
    - Work and energy
    - Castigliano's theorem
6. Introduction to elasticity (16 hours)……...Exercise-6 (30 points)
    - Equations of motion
    - Strain components in deformable bodies
    - Hooke's law for isotropic materials
    - Plane stress and plane strain
    - Boundary conditions

Final (460 points)

Total Grade =1000 points

Total sessions = 32 sessions

Total hours =48 hours

References

1. F.P. Beer, E.R. Johnston, D.F. Mazurek, Ph.J. Cornwell, and E.R. Eisenberg, Mechanics of Materials, 6th Ed.
2. A.P. Boresi, R.J. Schmidt, O.M. Sidebottom, Advanced Mechanics of Materials, 5th Ed.
3. M.H. Sadd, Elasticity, theory, applications, and numerics.