GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. Semester I
Civil Engineering (Structural Engineering)

Subject: -Theory of Elasticity and Stability

Sr. No	Course Content
1	Theory of Stresses: State of stress and strain at a point in two and three dimensions, stress and strain invariants, Hook's law, Plane stress and plain strain problems. Equations of equilibrium, boundary conditions, compatibility conditions, Airy's stress function. Two dimensional problems in Cartesian and polar coordinates, Saint Venant's principle, solution of beam problems. Torsion for non-circular sections and curved elements.
2	Classification based on Geometry, Stiffness, Materials etc. Structural elements-Fundamental behaviour of various types. Parameters of Safety and Stability: form, function, strength and stiffness. Analysis of structural elements. Buckling, post-buckling of columns, beams and frames.

REFERENCE BOOKS:

1. Schodek Daniel L, "Structures", 4/e/2002, Prentice Hall of India
2. Parikh Janak P, "Structural Analysis and Design", 1/e/2000, Charotar Pub. House
3. Ashwinikumar, "Stability of Structures", Allied Publishers, 1/e/1998
4. Timoshenko SP and Gere JM, "Theory of Elastic Stability", McGraw Hill, 1/e/1961
5. Wang C. K., "Applied Elasticity", McGraw Hill,
6. Venkatraman B & Patel A, "Structural Mechanic with introduction to Elasticity and Plasticity", McGraw Hill, 2/e/1970
7. Junnarkar SB & Shah HJ, "Mechanics of Structures Vol.-II, Charotar Publishers, 5/e/2002