

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 1

Civil Engineering (Computer Aided Structural Analysis & Design)

Subject Name Advanced Solid Mechanics

Sr. No	Course content
1.	Introduction: State of stress and strain at a point in two and three dimensions, stress and strain invariants, Hooke's law, plane stress and plane strain.
2.	Two dimensional problems in Cartesian & polar co-ordinates, solution by Airy's stress function, stress concentration, problems of torsion, curved elements, membrane analogy method, stress function of circular plates.
3.	Concept of stability, static dynamic and energy criterion of stability, flexibility and stiffness criteria, buckling, post buckling stages, stability of columns, beams, inelastic building, Beams – Column, Stability of frames, methods applied to stability problems.

Reference Books:

- | | |
|--|----------------------------------|
| 1) Theory of elasticity | N. Filonenko – Borodich |
| 2) Theory of elasticity | S. P. Timoshenko and J.N.Goodier |
| 3) Buckling of bars, plates and shells | Don O. Brush and B. O. Almoth |
| 4) Theory of elastic stability | S. P. Timoshenko and J.M. Gere |
| 5) Principles of structural stability theory | Chajes |
| 6) Structural stability of plates and shells | N.G.R. Iyengar |
| 7) An introduction to elastic stability to structure | G.J.Siitses |