

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

Subject Name: **Theory of Elasticity and Plasticity**
Subject Code: **714303**

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.
4	Theory of ideally plastic materials and its applications to thick wall shells. Expansion of cylindrical and spherical cavities in soil mass.

References 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. Almorth
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