GUJARAT TECHNOLOGICAL UNIVERSITY
B.E SEMESTER: 4
AUTOMOBILE ENGINEERING

Subject Name: **Mechanics of Deformable Bodies**

Sr. No.	Course content
1.	**Different forms of structures** Structures: Arches, cables, framed structure, continuum structures, plate and grid structures, membrane and net structures, displacement of statically determinate beams and trusses, double integration method, Macaulay's method, Conjugate beam method, Unit load method, Castigliano's 1st theorem
2.	**Combined flexural and direct stress** Combined flexural and direct stress, core of a section, Application of combined stress: wind pressure on wall and chimneys, water pressure on dams, earth pressure on retaining walls
3.	**Torsion of cylindrical shaft** Torsional shearing stress and strain, Torsion formula, Power transmission, composite shaft, strain energy in torsion, torsion combined with bending, torsion of tapered shaft combined with bending, shear and thrust, torsion of flange coupling
4.	**Column and strut** Short and long columns, Euler's theory, Rankine-Gorden formula, IS code formula, effect of initial curvature, laterally loaded column
5.	**Beams curved in Plan** Transversely loaded circular beams, quarter circular and semi circular beams supported on equally spaced supports fixed at one support
6.	**Unsymmetrical bending** Unsymmetrical bending, principal moment of inertia, bending stresses, shear centre
7.	**Curved Beams** Stresses in curved beams, Rings under load, stresses in rings, hooks and chain links
8.	**Structural Connections** Basic joint geometries, types of connections: bolted and welded, connections amongst beams, columns and brackets

Reference Books:

1. Analysis of Structures Vol. I & II by V. N. Vazirani and M.M. Patwari, Khanna Publishers
2. Mechanics of Structures Vol. I & II by S.B. Junarkar and H. J. Shah,
3. Strength of Materials & Theory of Structures Vol. I & II by B.C. Punamiya
4. Mechanics of Materials by James P. Gere, Stephen P. Timoshenko, PWS Publishing Co.
5. Mechanics of Solids by Abdul Mubeen, Pearson Education P. Ltd