

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Civil (Geotechnical Engineering)

Semester: I

Subject Name: **Advanced Geotechnical Engineering - I**
 Subject Code: **714301**

Sr. No	Course Content
1.	Stresses and displacements in soil: Soil as elastic body - concept of effective stress - equations of equilibrium in soil mass - principal stresses and strains - problems of plane stresses and strains -stress distribution by Boussenesq, Westerdgards theory - Newmark's chart - influence of anisotropy on stress distribution - applications to geotech problems.
2	Shear resistance: Stress -strain relationship in soils -failure criteria –Mohr Coulomb's failure -shear parameters under different drainage conditions construction - pore pressure in saturated and unsaturated soils -analytical predictions of pore water pressures -stress dilatency theory -results of plain strain shear tests -forces on shear parameters
3	Mechanics of consolidation: Phenomenon of consolidation -Terzaghi's theory of unidimensional consolidation - methods to determine precompression history -applications to estimate settlements - introduction of creep and stress relaxation by rheological models
4	Mechanics of flow through soils: Flow through soils - unidimensional - radial and Spherical flow cases - Seepage forces, Quick sand and Piping - Flow nets of confined and unconfined flow by relaxation techniques - Phreatic surfaces by conformal mapping - Flow net for anisotropic non-homogeneous soils, Stability of slopes.

References Books:

1. Scott R F, "Principles of Soil Mechanics", Addition Wesley Publishing Co. Inc.
2. Harr M E, "Foundation of Theoretical Soil Mechanics", McGraw Hill Book Co., New York
3. Kaniraj S R, "Design Aids in Soil Mechanics & Foundation Engineering", Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1988
4. Terzaghi , Peck .and Mesri " Soil Mechanics in Engineering Practice " 1996
5. Bowles J E "Foundation Analysis & Design" McGraw Hill Inc. New York, 1988.
6. Atkinson J.H, Bdransby P.L "Mechanics of soils "
7. Capper P., Leonard, Cassie W Fisher," Mechanics of Engg Soils "
8. Jumikies Alfred R,"Mechanics of soil fundamentals for advanced study "
9. Lambe William T, Whitman Robert V,"Soil Mechanics "
10. Yong Raymond N, Warkentin Beeno P,"Introduction to soil behaviour "