

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

**Subject: - Advanced Foundation Engineering (Major Elective II)**

<b>Sr. No.</b>	<b>Course Content</b>
1.	General requirements as per relevant IS code, bearing capacity computations as per relevant IS code including bearing capacity of stratified deposits, settlement computations as per relevant IS code, use of field tests like SPT
2.	Shallow foundations: different types, proportioning of footings for equal contact pressures, eccentrically loaded footings, soil design of combined footings, strap footing
3.	Rafts: different types, bearing capacity and settlement computations of raft on different soil deposits, determination of contact pressure under raft; concept of floating foundation basement raft, buoyancy raft
4.	Pile foundation: lateral load capacity of a pile, settlement analysis of pile group, under reamed piles, IS code provisions, pile load test
5.	Well foundations: different types, stability analysis
6.	Machine foundations: dynamic soil properties, natural frequency of machine foundation-soil system, different types of machine foundations, static and dynamic criteria for soil-foundation system, design of block foundations per IS code.
7.	Foundations on expansive soils, under reamed piles, waffle slab/raft, concept of CNS layer, chemical stabilization etc.
8.	Rigid retaining structures

**REFERENCE BOOKS:**

1. Kaniraj SR, "Design Aids in Soil Mech. And Foundation Engg. ", Tata McGraw Hill.
2. Swami Saran, Gopal Ranjan, "Analysis & Design of Foundations & Retaining Structures", Sarita Prakashan.
3. Nainan P Kurian, " Design of Foundation Systems", Narose Pub. House.
4. J. E. Bowles, "Foundation Analysis and Design", McGraw Hill .