

Course code	CE 185002
Type of course	Elective course
Course Title	Advanced Foundation Design and Construction
Credits	L T P Cr 4 0 0 4
Prerequisites	Soil Mechanics / Geotechnical Engineering-I, Foundation Engineering / Geotechnical Engineering-II, Reinforced Concrete Structures

Course Content:

Stress distribution in soils

Pressure bulb, Boussinesq and Westergaard theories, contact pressure distribution, arching in soils

Combined and Raft Foundation

Proportioning of foundation for equal settlement, modulus of subgrade reaction, design of rectangular combined foundation, trapezoidal combined foundation, strap foundation, rigid raft foundation and flexible raft foundation; codal provisions, construction aspects for combined and raft foundations

Pile Foundation

Types, function, selection of piles; end-bearing and friction piles, vertical and lateral load carrying capacity of single pile, group action of piles, negative skin friction, settlement of pile groups, pile load tests, structural design of pile and pile cap, construction aspects for pile foundation, codal provisions for pile foundation, concept of piled-raft foundation

Machine Foundation

Types, design criteria, spring mass analogy, dynamic soil-spring constants, free and damped vibrations, degrees of freedom of block foundation, cyclic plate load test, down hole test, cross hole test, codal provisions for machine foundations, vibration isolation

Overview of Special Foundations

Foundations for tank, chimney and silo; caissons and well foundations, underwater construction aspects, recent advancements in foundation design and construction

Reference / Text Books

1. Bowles, J. E., Foundation Analysis and Design, McGraw Hill International Ed.
2. Das, B.M., Principles of Foundation Engineering, Cengage Learning
3. Tomlinson M and Woodward J, Pile Design and Construction Practice, Taylor and Francis
4. Das, B. M. and Ramana, G. V, Principles of Soil Dynamics, Cengage Learning
5. Prakash S and Puri V. K, Foundations for Machines: Analysis and Design, John Wiley and Sons
6. Gopal Ranjan & A.S.R. Rao, Basic and Applied Soil Mechanics, New Age Publishers
7. Murthy, V.N.S., Soil Mechanics and Foundation Engineering, CRC Press
8. Relevant Standards / Codes
9. Recent technical literature on related topics

Any other Remarks: