6CE146 Advanced Soil Mechanics

L-T-P: 3 - 0 – 0-3

Prerequisite:

A Pass grade or having attended at least 75% of the classes conducted or at least 60 % attendance and a minimum of 40% marks in the course (s) Geotechnical Engineering –II, CE 118.

Objective:

To impart advanced knowledge and skill for soil identification, classification other physical properties of soils, viz. seepage, stress distribution, compaction and consolidation.

Theory: 1. Soil Structures & Mineralogy: Soil texture, Solid particles in soil, Atomic & molecular bond, Inter-particle forces in a soil mass, Single grained structure, Honey -comb structures. Flocculent &dispersed structures, Structure of connected soil, Clay minerals. 6 Lectures

2. Soil Water: Modes of occurrence of water in soils- Absorbed water, Double layer, Capillary water. 2Lectures

3. Stress condition in soil - Effective & neutral pressures. 6 Lectures

4. Capillary permeability test. Drainage & Dewatering Ditches & sumps, Well point system, Shallow well system, Deep well drainage, Electrosmosis method, Protective filters. 6 Lectures

5. Shear Strength Use of Stress path in triaxial test- Undrained& drained tests for Normally Consolidated & Over Consolidated clay samples. 7-Lectures

6. Skempton‘s pore-pressure parameters, Choice of shear parameters. Stability of open cut - braced open cut. Bishop‘s rigorous method, Limit equilibrium approach. 7 Lectures

 7. Bulk Head & Cofferdams: Classification - cantilever sheet pile wall in cohesionless and in cohesive soils Arching in soils, Classes of underground conduits, loads on positive projecting and negative projecting conduits. 8 Lectures

Text Books: 1. Geotechnical Engineering - S. K. Gulatiet. al., TMH Publishing Co. Ltd, New Delhi. 2. Basic and Applied Soil Mechanics - GopalRanjan and A. S. R. Rao, Wiley Eastern Ltd, New Delhi. 3. Lambe T. W. and Whitman, R.V. (1979), Soil Mechanics, John Wiley & Sons Inc.

Reference Books: 1. Soil Mechanics in Engineering Practice - Terzaghi and Peck, John Wiley and Sons Inc., New York. 2. Soil Mechanics- Lamb and Whitman, Wiley Eastern Pvt. Ltd, New Delhi. 3. Fundamentals of Soil Mechanics - Taylor, John Wiley and Sons Inc New York. End Semester Examination (3 Hrs.): The duration of the Examination will be 3 hrs. The questions will be comprehensive, i.e. from the entire unit, may have subsections with theory and numerical with approximately 50% weightage and may / may not have choices. Minimum five questions will have to be answered Expected Outcome: The students would be able to identify, classify and determine physical properties of different types of soils.