

Course Title: advanced soil mechanics

Number of Credits: 3

Prerequisite (Corequisite): Structural analysis (I), Concrete Technology **Lecturer: -**

Course Topic

- Effective stress :the concept of effective stress and the need to define it , the effect of contact surface of seeds ,the effect of solid grains density, the effect of other factors, the evaluation of Terzaghi's effective stress
- The principals of semi-saturated soil mechanics , Bishap relation for effective stress ,the theory of state variables of independent stress, semi- saturated soils of shear strength ,deformation of semi – saturated soils , usage in the common issues of soil mechanics
- Properties of clay soils: types of clay minerals , the effect of type of mineral on the physical and mechanical properties of clays , the effect of physical and chemical forces on the effective stress
- Fundamentals of analysis methods in soil mechanics :complete problem solving in continuous environments, elastic analysis ,limit analysis ,limit equilibrium ,the method of characteristic lines
- Consolidation :Generalities, theoretical consolidation Terzaghi and its restrictions consolidation of non-homogeneous soils with variable thickness ,non-linear consolidation three-dimensional consolidation , Biot theory of secondary consolidation
- Soil shear strength: introducing – Mohr coulomb rupture criteria,critical state line and undrained shear strength, critical state line and pore water pressure at rupture ,shear strength of cohesive soils, shear strength of seed soils, laboratory tests to determine shear strength parameters, total and effective stress analysis ,critical state strength and residual state strength
- Soil mechanics critical state: the behavior of the soils in states and different stress routes ,stress and strain routes and its independents and soil tests, critical state in clay soils, Border mode surfaces (critical stats line on the surface of Rusc oand etc.),the behavior of pre – consolidated samples (Versailles surface),critical mode in sandy soils and other seed soils , critical state model of CAM-CLAY
- Introducing the problematic soils: soils with high compressibility ,expansive soils, collapsible soils ,introducing relevant tests

Course Description:

Reading Sources:

Course Goals and objectives:

Evaluation:

Course topics:

The course aims to: