

CE 565: Fundamentals of Geomaterials Behavior

Course Description:

Atoms and molecules, crystal chemistry, clay minerals, structure of solids, phase transformations and phase equilibria. Surfaces and interfacial phenomena, colloid chemistry, mechanical properties. Applications to soils and civil engineering materials. Overview of state-of-the-art instrumental techniques for analysis of the physicochemical properties of soils and civil engineering materials.

Course Outcomes (students should be able to):

1. Describe the micro-mechanical behavior at the particulate level and its influences on engineering properties at the macro-scale.
2. Characterize soil based on physio-chemical methods.
3. Evaluate laboratory techniques to quantify mineralogy, fabric and the soil structure
4. Compare soil property correlations.
5. Provide a basis for the understanding of the engineering properties of soils and the factors controlling their strength and deformation.