

**Course Unit : Clays in geotechnical and civil engineering applications  
(42 h – 4.5 ECTS –elective)**

**Content**

**Engineering Classification of soils**

Classification and identification properties of soils. Shrinkage and swelling potential of fine-grained soils. Classification systems.

**Density and Compaction**

Weight-volume relationships. Principles of compaction. Compaction tests and definition of the optimum water content and the maximum density for soils.

**Permeability**

Empirical formulae for the estimation of soils permeability. Principles and application of the permeability tests.

**Compressibility of clays**

Properties of fine-grained soils in relation to amplitude and rate of settlement of structures. Determination of consolidation coefficients and calculation of long term settlement of structures.

**Shear Strength of clays**

Shear strength theory. Principles of the unconfined compression and direct shear tests. Determination of the shear strength parameters for analyzing the stability of foundations, excavations, slopes, retaining walls, etc.

**Learning outcomes**

Theoretical knowledge in the concepts of understanding the engineering properties of soils. Application of the theory for estimating the soil behaviour and improving the properties of the soils. Practical skills in applying experimental procedures.

**Horary**

Lectures : 14 h

Tutorials : 8 h

**Practical laboratory work** : 20 h

**Evaluation**

\* Final examination : 60% of the mark.

\* Evaluation during the teaching period : 40 % of the mark (tutorials 20%, laboratory projects 20%).

**Teaching Staff**

**Emmanuil STEIAKAKIS**  
(TUC, Chania),

**Dionyssios VAVADAKIS**  
(TUC Chania)

