

Course name: GEOTECHNICS I. (SOIL MECHANICS)

Course code: YCRGET1BNF

1 lecture / 0 practice / 3 laboratory /; E: exam / 8 credits

Department: Department of Geotechnics and Structural Engineering

In charge: Associate Professor Tibor Firgi PhD

For students of BSc in Civil Engineering

Pre-requirements for Erasmus students: none

OBJECTIVE OF THE COURSE:

Getting to know, classifying the properties of the soil, its behaviour under the influence of human interventions. Physical and strength properties of soils with special regard to the forces that affect the stability of the soil and structure. The different levels of groundwater, corrosive and chemical effects. Soil models used for computer scaling. The soil exploration methods, sampling, laboratory and field studies. Evaluation and documentation of geotechnical data.

14 WEEKS SCHEDULE:

1. week: Lecture: Introduction. Location and role of the subject in the construction industry.
Practice: Safety rules in the laboratory. Introduction to the Soil Mechanics Laboratory. Types of Rocks and the Rock Cycle.
2. week: Lecture: Direct soil exploration methods. Sampling.
Practice: Soil Identification, Soil Exploration and Sampling.
3. week: Lecture: Indirect soil exploration methods.
Practice: Soil Phase Relationship; Task Solution.
4. week: Lecture: Soil condition characteristics. Soil components, soil structures. Properties of soil constituents.
Practice: Granular Soil Identification: Sieves Analysis, Hydrometer Analysis; Preparation of laboratory test documentation.
5. week: Lecture: Identification characteristics. Granular soils.
Practice: Cohesive Soil Identification: Plastic Limit, Liquid Limit, PI, CI; Preparation of laboratory test documentation.
6. week: Lecture: Identification characteristics. Cohesive soils. Organic matter and lime content.
Practice: Soil Compaction; Preparation of laboratory test documentation; Task Solution.
7. week: Lecture: Soil incorporation characteristics. Soil compactness, compressibility.
Practice: 1. test; Data Collection, Exploration plan, drilling report, contents of boreholes, groundwater levels.
8. week: Lecture: Groundwater.



Practice: Water Permeability; Preparation of laboratory test documentation.

9. week: Lecture: Water movement in the soil.

Practice: Vertical Tension; Task Solution.

10. week: Lecture: Initial condition of stress state of soils. Deformation of soils.

Practice: Oedometer Test, Preparation of laboratory test documentation.

11. week: Lecture: Shear strength of soil. Soil strength characteristics.

Practice: Stress, strain and failure in soils; Task Solution.

12. week: Lecture: Evaluation, representation and documentation of geotechnical data.

Practice: 2. test; Soil Mechanics Documentation, Soil Test Report; Task Solution.

13. week: Lecture: Soil models. Soil mechanics of unsaturated soils.

Practice: Soil Mechanics data processing; Task Solution.

14. week: Lecture: Summary. Case studies.

Practice: 1.-2. Redo tests.

Assessment:

The practice lessons can be missed up to three times.

During the semester, protocols of laboratory tests must be prepared (6 pieces). All laboratory protocols should be prepared.

Two tests will be written during the semester. Both tests must be written in at least 2 grades.

Oral exam from the material of the lectures of the semester and literature too.

