GEOTECHNICAL ENGINEERING

Study programme: Civil Engineering

1. Geotechnical investigation: Field investigation and sampling; Preliminary and design investigations; Ground water measurement

2. Classification of soil: Soil description and composition; Determination of the particle sizes and their distribution, grading characteristic; Plasticity and consistency, plasticity chart

3. Compressibility Consolidation; One dimensional compression (oedometer) tests, Compressibility index**;**

4. Soil Compaction: Objectives for Compaction, Compaction characteristics

5. Shear strength of soil: Mechanical behaviour characteristics of soil, the failure criterion; Laboratory determination of shear strength, Residual and peak strength characteristics

6. Effective stress concepts: Stresses in a soil mass; Total stress and pore water pressure; Definition of "effective" stress; Vertical stresses under level ground surface

7. Lateral earth pressure: Earth pressure at rest, active and passive earth conditions

8. Slope stability: Slope stability analysis, calculation methods of analysis, types of slip (failure) surface, Method of Slices, Landslide stabilisation

9. Geotechnical parameters for foundation design : Geotechnical parameters based on field and laboratory testing, testing methods, derived values of geotechnical parameters , **Characteristic value of geotechnical parameters**: Definition, determination of characteristic values of geotechnical parameters, Methods for evaluation

10. Shallow (spread) foundation: Types of spread Foundations; Design of spread foundation (Soil-bearing capacity and settlement calculations);

11. Deep foundations: Types of deep foundations, Procedure of pile installation, testing and monitoring

12. **Design of pile foundations** Classification of piles with respect to load transmission and functional behaviour; Design of pile foundations – ULS, SLS (Soil-bearing capacity, settlement)

13. Retaining Structures: Types of Retaining Walls; technology of execution, limitations of different technologies

14. Design of Retaining Structures: Basic principles of embedded – cantilevered walls, anchoring

15. Site improvement methods: Types of Site Improvement Methods; Factors to be considered in Selecting Soil Improvement Method