Design of Geotechnical Structures – Excavation Pits, Retaining Structures and Soil Improvement

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Module number	**Credits**	**Workload**	**Semester[s]**	**Duration**	**Group size**
SE-CO-14	6 CP	180 h	3. Sem.	1 Semester[s]	no limitation

Courses	**Contact hours**	**Self-study**	**Frequency**
a) Design of Geotechnical Structures – Excavation Pits, Retaining Structures and Soil Improvement	a) 4 WLH (60 h)	a) 120 h	a) each winter

Module coordinator and lecturer(s)

Prof. Dr.-Ing. Torsten Wichtmann

a) Dr.-Ing. Merita Tafili, Dr.-Ing. Nazanin Irani, Prof. Dr.-Ing. Torsten Wichtmann

Admission requirements

Learning outcome, core skills

After successfully completing the module, the students are able to

- perform the proofs of ultimate limit state and serviceability limit state for different types of retaining structures as well as other components of construction pits in accordance with Eurocode 7, supported by in-situ testing and laboratory experiments,
- recommend the appropriate retaining structure according to soil conditions, expected loads and design requirements,
- recommend the appropriate method of soil improvement according to soil conditions, expected loads and design requirements

Contents

a)

The course:

- Introduces possible failure mechanisms of retaining systems, soil slopes as well as excavation pits and soil dikes
- Gives a general overview to different type of retaining structures (e.g. flexible and rigid) with active and passive facings
- Discusses different calculation methods to determine the safety factor of the slopes, excavation pits and retaining structures against failure
- Explains multitude of supporting techniques (e.g. back anchoring, nailing, etc.) with their corresponding design methods
- Gives an overview to geosynthetic soil reinforced geostructures
- Introduces different methods of soil improvement

Educational form / Language

a) Tutorial (2 WLH) / Lecture (2 WLH) / English

Examination methods

• Written exam 'Design of Geotechnical Structures – Excavation Pits, Retaining Structures and Soil Improvement' (180 min., Part of modul grade 100 %)

• Homework with GGU application to geotechnical problems, giving bonus points for the exam.

Requirements for the award of credit points • Passed final written examination
Module applicability • M.Sc. Subsurface Engineering
Weight of the mark for the final score Percentage of total grade [%] = 6 * 100 * FAK / DIV FAK: The weighting factors can be taken from the table of contents. DIV: The values can be taken from the table of contents.
Further Information Tutorials include computer exercises with program GGU