Foundation Engineering and Utility Pipe Construction: Design – Engineering – Technologies

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Module number	Credits	Workload	Semester[s]	Duration	Group size
BI-WP10/SE-CO-1	6 CP	180 h	3. Sem.	1 Semester[s]	no limitation

Courses	Contact hours	Self-study	Frequency
a) Design, engineering and technologies in Foundation Engineering and Utility Pipe Construction	a) 4 WLH (60 h)	a) 120 h	a) each winter

Module coordinator and lecturer(s)

Prof. Dr.-Ing. Markus Thewes

a) Prof. Dr.-Ing. Markus Thewes, Dr.-Ing. Britta Schößer

Admission requirements

Recommended previous knowledge:

Bachelor-level knowledge of construction operations and construction process engineering, Bachelor-level knowledge of foundation engineering and soil mechanics

Learning outcome, core skills

The module intends to provide students with a comprehensive understanding of the field of design, engineering and technology regarding Foundation Engineering and Utility Pipe construction. They will acquire in-depth knowledge for special areas of foundation engineering for the accomplishment of engineering tasks on areas planning, construction and operation. Foundation engineering is the field of civil engineering, which deals with the design and construction of subsurface structures which typically are built in open excavation pits. The students will learn to work on tasks from these areas and to develop an understanding of the methods. They will be enabled to independently solve the common problems of foundation engineering and utility pipe construction. Connections of this field with other areas of the building industry as interdisciplinary task are recognized and integrated into the solutions of project processing. The students acquire knowledge that is necessary for the preparation and processing of construction projects in construction management. The methods commonly used in practice shall be applied.

Contents

a)

The lecture deals with the extended basic knowledge of construction process engineering.

Design, engineering and technologies in Foundation Engineering

- Dewatering / Water management
- Construction pit system (Girder System, Diaphragm Wall, Bored Pile Wall, etc.)
- Caisson systems
- Grout injection techniques (low and high pressure methods, etc.)
- Injected piles
- Underpinning
- Cut and Cover method
- Conventional sealing methods (waterproofing)
- Construction of jointing

- Open trench methods in Pipeline Construction

Pipeline Construction (Trenchless Construction Techniques - unmanned)

- Technical principals of unmanned techniques – steerable
- Technical principals of unmanned techniques – non-steerable
- HDD Horizontal Directional Drilling, Direct Pipe

Educational form / Language

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

Examination methods

• Written exam 'Design, engineering and technologies in Foundation Engineering and Utility Pipe Construction' (120 min., Part of modul grade 100 %, optionally English or German)
• Term paper 'Process Technology and Construction Management - Homework' (30 h., Part of modul grade 0 %, optionally English or German)

Requirements for the award of credit points

- Presentation of the results of the homework assignment
- Passed written examination of the module

Module applicability

- M.Sc. Civil Engineering
- M.Sc. Environmental Engineering
- M.Sc. Subsurface Engineering
- M.Sc. Geosciences

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