VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF CIVIL ENGINEERING

Civil Engineering - Geotechnics and Underground Engineering

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Faculty	Faculty of Civil Engineering
Type of study	Follow-up Master
Language of instruction	English
Code of the programme	N0732A260006
Regular period of the study	1,5 year
Cost	50,000 CZK per semester
Coordinating department	Department of Geotechnics and Underground Engineering
Coordinator	doc. RNDr. Eva Hrubešová, Ph.D.

About study programme

Why is it appropriate to study this study program?

-perspective multidisciplinary study program focused mainly on:
•foundation engineering
•stability and rehabilitation of slopes, embankments of traffic roads, earthfill dam
•tunnels and other types of underground structures
•evaluation of transport processes in the rock environment, including thermal processes associated with geothermal heat exchangers
•technical seismicity
•technical blasts and their effects
-the unique study program in the Czech Republic
-a long tradition of teaching in the field of geotechnics and underground engineering at the university, quality personnel and material support of teaching (including teaching laboratories and software equipment)
-interconnection of studies with practice in the form of inserted lectures by experts from companies, excursions and internships
-graduates have a high job placement in the labor market in the Czech Republic and abroad, they have excellent financial rewards
-no construction can exist without knowledge of geotechnics

Study aims

Study of the program Civil Engineering-Geotechnics and Underground Engineering follows the long tradition of teaching focused on the field of geotechnics and underground and mining construction at VŠB-TUO, which is dated since 1955.
The basic objective of study is the complex education and training of professionals in this field and the achievement of a level of engineering education that ensures the effective use of acquired information, especially in the field of geotechnical, underground and mining construction, foundation engineering, but also in the field of environmental and energy geotechnics.

Following sub-objectives can be specified:
• Expanding and deepening knowledge and skills from basic profiling areas, including underground and mining engineering, foundation engineering and geotechnical structures so that graduates are able to solve complex tasks of geotechnical practice and research using modern construction techniques and methods related to automatization and the use of new information technologies (BIM etc.)
• Expanding and deepening the knowledge of concrete, steel and wood structures, which are an important part of geotechnical structures
• Education in specialized subjects focusing on blasting work and technical blasting, technology of excavation and reinforcement of

underground and mining works, geotechnical surveying, mathematical modelling, geohydrodynamics, unconventional methods of construction of underground works, environmental geotechnics (landfill, flood protection dam, dumps, etc.), fast-growing areas of energy geotechnics connected with the use of geotechnical structures for the extraction and storage of geothermal energy
• Implementation of courses in the field of testing, quality, organization and management of buildings to increase the management and organizational skills
• Increasing the interconnection of teaching with practice, especially in the final period of study, which contributes to the improvement of the final diploma thesis and successful and rapid involvement into the practical work after graduation
• Participation in the scientific and research activities and projects
• Motivation and readiness of students with best study results as well as results of scientific and research activities for the subsequent PhD study in doctoral study program Geotechnics and Underground Engineering

Graduate's knowledge

•knowledge of technical, ecological and economic disciplines relevant to construction practice in the field of geotechnics, underground construction and wider civil engineering practice
• knowledge of natural sciences, technical, environmental and economic disciplines relevant to mining construction, activities carried out in a mining manner and blasting (explosiveing) practice and geotechnical survey
• knowledge of legislation in the field of geotechnical, underground and mining construction
• knowledge in the field of organization and management of buildings
• knowledge of relevant safety regulations in the field of blasting works and activities carried out by mining activities
Graduate acquires the following knowledge and skills:
• knowledge of the technology of realization of geotechnical, underground and mining engineering
• knowledge in the field of ventilation and safety in underground and mining construction
• knowledge in the field of geotechnical risks associated with the realization of geotechnical and mining ...
• skills related to the use of technical procedures and modelling in solving problems of geotechnics, underground and mining construction
• skills related to the design, implementation and management of various types of geotechnical and underground constructions

Graduate's skills

Graduate of the Master's programme Civil Engineering - Geotechnics and Underground Engineering will be prepared on the basis of acquired knowledge and skills:
• design and realization of the geotechnical surveys for all types of geotechnical and underground constructions and structures
• design, implement and manage all kinds of geotechnical, underground and mining buildings in the rock environment (construction pits, underground structures, tunnels, mining works, transport embankments, dumps, landfills, etc.) using modern construction, modelling and information technologies (e.g. BIM)
• assess the reliability of geotechnical, underground and mining structures and structures, including reliability with regard to the environmental impacts of buildings and structures
• contribute to the development of knowledge in the field through scientific research activities

Hard skills

- Knowledge of testing properties of soils and rocks using laboratory and field tests
- IT skills/knowledge: MS Office, (Easy archive advantage)
- Reading technical documentation
- Knowledge of documentation processing and calculation in the field of dimensioning reinforcement for underground mining works
- Designing
- Application of computer design programmes
- Orientation in technical drawings

- Knowledge of mathematical models
- SW Autocad
- Knowledge of the development of plans and documentation related to mining activity or activity carried out in a mining manner
- Knowledge of properties of particulate materials
- SW from the field of geotechnics
- (Eurocode 7) ČSN EN 1997 Design of geotechnical structures
- Design and management of concrete structures
- Ventilation of tunnel excavations and underground works
- Line constructions
- SW from the field of underground construction
- (Eurocode 1) ČSN EN 1991 Loading of structures

Study curriculum

- form Full-time (en)
- form Part-time (en)