
Civil Engineering

Fields of education: Construction and Planning

1. Professional qualification

Professional career outline

Civil Engineering focuses on teaching the relevant skills in different disciplines, such as bridge engineering, structural engineering, geotechnical engineering including tunnel engineering and dam construction, railroad and road engineering, river engineering and hydraulic engineering, the maintenance of existing engineering structures, sustainable and energy-efficient construction, natural hazards and the façades. Graduates of the MSE degree program in Civil Engineering are able to fill senior positions in engineering firms, building companies or administration.

Professional skills

Graduates of the MSE degree program in Civil Engineering are able to deal with the complex issues associated with current and future challenges seen in civil engineering, to manage demanding projects and to convey the results professionally.

Entry skills

Specific skills are required to enrol in this profile. Students holding one of the following Bachelor degrees generally fulfil these entry requirements.

- BSc in Bauingenieurwesen I Civil Engineering
- BSc in Geomatics, major in Construction and Infrastructure (BSc HES-SO)

The assessment of the entry skills is part of the enrolment process of the respective school. Students who do not hold one of the above mentioned Bachelor degrees will be individually assessed for their suitability by the respective University of Applied Sciences.

Differentiation to bachelor level

On a bachelor level, students are taught in all disciplines of civil engineering, with practical studies leading to professional qualifications. In the master's degree program, the specialist skills are focused on in more detail and expanded with scientific methodological skills and management skills. On completion of their master's degree, graduates are able to manage major planning tasks and more challenging projects and to take on responsibility for entire processes.

2. Profile contents

The profile covers the following content:

In "Structural Engineering", the focus is on advanced methods in structural analysis and in concrete, steel, composite and timber structures. Additional skills in the theory of stability and theory of plasticity, earth-quake engineering and maintenance of structures maybe obtained. Graduates are able to calculate, to plan, to manage and to supervise the development of demanding concepts for supporting structures on new and existing buildings. Furthermore the implementation of structural, dynamic and energy requirements in technically feasible structures is supported.

In "Geotechnical Engineering", the focus is on the analysis and assessment of natural hazards, plus planning, project planning and supervision of structures and measures seen in geotechnical engineering. Extended basics of soil mechanics lay the foundation for applying numerical methods and material laws

of a higher order, plus for describing the behaviour of partially saturated soils. Additional areas of special civil engineering taking into account the interaction between soil and structure, improvements to building sites, building with geosynthetics and rock mechanics can also be explored.

In “Hydraulic Engineering”, the focus is on dealing with current and future challenges in the field, such as climate change and its effects on flooding and low water levels in rivers and water supplies in drainage areas, material transport in rivers and groundwater, and ecology, revitalisation and sustainability in hydraulic engineering. Additional skills in hydrological and hydraulic modelling (2D and 3D), ethohydraulics and sustainable building materials and engineering methods can also be obtained.

In “Transport Planning and Transport Systems”, the focus is on expanding on the fundamentals of transport planning and management, particularly in connection with urban agglomerations, the planning and operation of public transport systems, road engineering, urban street design, rail engineering and digital mobility instruments. Additional skills for examining existing transport systems can also be obtained.