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Curriculum for the

Bachelor's Programme in Civil Engineering

at the Faculty of Engineering Sciences of the
University of Innsbruck

(New release 2025)

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§ 1 Allocation of the study programme

Pursuant to §54 Universities Act 2002, the Bachelor's Programme in Civil Engineering is grouped among the engineering sciences study programmes.

§ 2 Admission

Admission to the degree programme is granted by the Rectorate in accordance with the provisions of the Universities Act 2002 - UG on admission to bachelor's degree programmes.

§ 3 Qualification profile

(1) The field of civil engineering encompasses a wide range of tasks related to the construction and maintenance of building structures, which require a high level of specific expertise and a responsible approach to work. As complex construction projects always bring together a wide range of specialist areas and therefore many people, social skills such as teamwork and target group-orientated communication are particularly important when working at the interfaces. The tasks include planning, design, construction, calculation, execution, operation and maintenance as well as the dismantling of structures such as buildings, bridges, tunnels, dams and the protective structures that are particularly necessary in the Alpine region and many more.

Particular importance is always attached to aspects of technical diligence, sustainability and economic efficiency. Civil engineering covers the theoretical foundations and ensures constant progress in the context of research and development.

(2) The bachelor's programme includes disciplines of structural engineering, such as building construction, concrete and masonry construction, as well as steel and timber construction. Further contents are geotechnics, traffic route construction, structural hydraulic engineering and urban hydraulic engineering as well as surveying, construction operations, construction management and project management. The theoretical foundations required for this are taught as part of a basic scientific degree programme, which includes the core areas of mathematics, geometry, computer science, technical mechanics, structural analysis, hydraulics, building physics and materials science.

(3) In the Bachelor's Programme in Civil Engineering, important skills are acquired through the teaching of essential concepts of modern civil engineering, based on the associated research and with an emphasis on the engineering mindset:

1. Explaining building constructions, construction processes, construction projects, construction sequences and the structuring of construction projects, which are required at the theoretical competence level of a construction manager.
2. The ability to abstract and model simple and basic models necessary for design and calculation.
3. This leads to a comprehensive understanding of the process and the ability to find solutions using analytical and numerical methods.
4. This enables graduates to critically interpret, evaluate and analyse data, boundary conditions, models and calculation results within the framework of the fundamental models covered.
5. A mixture of different teaching methods and the opportunity for interdisciplinary Bachelor's Theses promotes both independent and team-oriented work, as well as networked thinking. Tutorials and group tutorials increase the ability to work in a team. Final presentations promote target group-orientated communication.
6. After completing the programme, students are able to document and present the content they have studied in an understandable and comprehensible manner.

(4) The above-mentioned competences, which are indispensable for the versatile field of civil engineering, increase flexibility with regard to constantly changing job profiles. They are therefore a guarantee for successfully shaping their own future, whether as part of a master's programme or in the professional world. Graduates of the Bachelor's Programme in Civil Engineering at the University of Innsbruck are thus prepared both for engineering practice and for a relevant Master's degree programme.

§ 4 Scope and duration

The Bachelor's Programme in Civil Engineering covers 180 ECTS-Credits. This corresponds to a duration of the study programme of six semesters. One ECTS-Credit corresponds to a workload of 25 hours.

§ 5 Types of courses and maximum number of students per course

(1) Courses without continuous performance assessment:

Lectures (VO) are courses held in lecture format. They introduce the research areas, methods and schools of thought for a given subject. No maximum number of students per course.

(2) Courses with continuous performance assessment:

1. Seminars (SE) provide in-depth study of contents, methods and techniques of a specialist area including presentations and discussions. Maximum number of students: 30; Seminar with Bachelor's Thesis: 15.
2. Tutorials (UE) focus on the practical treatment of concrete scientific tasks within an area. Maximum number of participants: 30, for laboratory and equipment tutorials: 15.
3. Lecture-tutorials (VU) focus on the practical treatment of concrete scientific tasks that are discussed during the lecture parts of the course. Maximum number of participants for the tutorial part: 30, for laboratory and equipment tutorials: 15.

§ 6 Allocation of places in courses with a limited number of participants

In courses with a limited number of participants, course places are allocated as follows:

1. Students of the Bachelor's Programme in Civil Engineering and Environmental Engineering are to be given priority.
2. Students for whom the study duration would be extended due to the postponement are to be given priority.
3. If the criteria in no. 1 and 2 do not suffice, first, students for whom this course is part of a compulsory module are to be given priority, and second, students for whom this course is part of an elective module.
4. If the criteria from no. 1 to no. 3 do not suffice, the available places are randomly allocated.

§ 7 Studies Induction and Orientation Stage

(1) Within the scope of the Studies Induction and Orientation Stage, which takes place in the first semester, the following course examinations are to be passed:

1. Mathematics 1 (VO 4, 5 ECTS-Credits),
2. Mechanics 1 (VO 1, 2 ECTS-Credits),
3. Building Construction (VO 2, 2.5 ECTS-Credits).

(2) Positive evaluation of all exams in the Studies Induction and Orientation Stage entitles to passing all further courses and exams as well as to writing the Bachelor's Thesis in consideration of the respective prerequisites.

(3) Before the completion of the Studies Induction and Orientation Stage, courses covering 20.5 ECTS-Credits may be completed from the following programme:

1. Construction Engineering and Economics 1 (VO 2, 2.5 ECTS-Credits; UE 2, 2.5 ECTS-Credits),
2. Mathematics 1 (UE 2, 2.5 ECTS-Credits),
3. Programming Language (VO 1, 1.5 ECTS-Credits; UE 2, 2.5 ECTS-Credits),
4. Mechanics 1 (UE 1, 1.5 ECTS-Credits),
5. Mechanics 2 (UE 2, 3 ECTS-Credits)
6. Strength of Materials 1 (UE 2, 3 ECTS-Credits)
7. Mathematics 2 (UE 2, 2.5 ECTS-Credits)

8. Fundamentals of Sustainability and Climate Responsibility in Construction Projects (VU 2, 2.5 ECTS-Credits),
9. Engineering Geology (VO 2, 2.5 ECTS-Credits)
10. Geometric Modelling, Visualisation and CAD (VO 2, 2.5 ECTS-Credits; UE 2, 2.5 ECTS-Credits),
11. Road Infrastructure (VO 1, 2.5 ECTS-Credits; UE 1, 1.5 ECTS-Credits)
12. CAD Advanced Training Course (VU 2, 1.5 ECTS-Credits)
13. Mathematics Advanced Training Course (VU 2, 1.5 ECTS-Credits)
14. Mechanics Advanced Training Course (VU 2, 1.5 ECTS-Credits)

§ 8 Compulsory and elective modules

(1) The following compulsory modules covering 167 ECTS-Credits are to be passed.

1.	**Compulsory Module: Mathematics 1**	**h**	**ECTS-Credits**
a.	**VO Mathematics 1**	4	5
b.	**UE Mathematics 1**	2	2.5
	Total	**6**	**7.5**
	Learning Outcomes: Ad a and b: Students are able to explain and apply fundamental topics in mathematics for an engineering study programme (linear algebra, differential and integral calculus). They are qualified to use this knowledge to solve practical problems.		
	Prerequisite/s: none		

2.	**Compulsory Module: Mechanics 1 and Programming**	**h**	**ECTS-Credits**
a.	**VO Mechanics 1**	1	2
b.	**UE Mechanics 1**	1	1.5
c.	**VO Programming Language**	1	1.5
d.	**UE Programming Language**	2	2.5
	Total	**5**	**7.5**
	Learning Outcomes: Ad a and b: Students can describe the principles of mechanical modelling and classify forces. They are able to reduce groups of forces, set up equilibrium conditions and calculate the centre of forces (centre of gravity). They can judge whether a planar or spatial mechanical system consisting of rigid bodies is supported in a statically determinate manner and can formulate equilibrium conditions for calculating the support reactions. They are able to apply the principle of section and describe the mechanical relationships for the uniaxial and plane stress state. They are able to determine the internal forces from the internal forces of beams. They are able to calculate the internal forces for statically determinate planar and spatial beam structures and check the relationship between internal forces and external forces with the help of local equilibrium conditions. They are able to apply the mechanics tasks dealt with to suitable model problems and derive the underlying theories and equations. Ad c and d: Students can solve mathematical and engineering problems in a programming language, present data and calculation results in comprehensible graphics and develop user-friendly user interfaces for calculation programmes.		
	Prerequisite/s: none		

3.	Compulsory Module: Building Constructions, Sustainability and Engineering Geology	h	ECTS-Credits
a.	**VO Building Constructions**	2	2.5
b.	**VU Fundamentals of Sustainability and Climate Responsibility in Construction Projects**	2	2.5
c.	**VO Engineering Geology**	2	2.5
	Total	**6**	**7.5**
	Learning Outcomes: Ad a: Students can list the standard construction methods, load-bearing systems and the requirements for these load-bearing systems. They can list the basic parameters of the most commonly used building materials and apply them to the load configuration. In addition, students are able to visualise standard structures for wall, ceiling and roof structures with the various building materials and explain the interaction of the individual component layers. Ad b: Students are able to explain the mechanisms and future scenarios of climate change, name the EU-wide and Austrian climate targets and identify their implementation in corresponding regulations relating to the construction industry. They can implement energy-efficient, cost-effective and climate-resilient construction, choose fossil-free energy supplies for heating, ventilation and air conditioning and evaluate building materials and constructions in terms of the circular economy. Ad c: Students can differentiate between minerals and rocks. They can explain geological processes and their influence on solid and unconsolidated rocks and assess the possibilities and limitations of geological-geotechnical investigations, subsurface models and forecasts. In addition, they can name the geological, hydrogeological and geotechnical significance of pore, fissure and karst groundwater and apply the necessary laboratory tests for soil naming and classification of soils and analyse the results.		
	Prerequisite/s: none		

4.	Compulsory Module: Construction Engineering and Economics 1	h	ECTS-Credits
a.	**VO Construction Engineering and Economics 1**	2	2.5
b.	**UE Construction Engineering and Economics 1**	2	2.5
	Total	**4**	**5**
	Learning Outcomes: Ad a and b: Students are able to name and describe the basic principles of construction operations (construction equipment, construction methods and construction processes), describe the various phases of a construction project and their typical processes, and identify the relationships between the individual spheres of the construction industry (client and contractor). They are able to explain the basic principles of tendering and awarding contracts, cost calculation and pricing as well as construction contracts, discuss construction management and construction industry issues and solve simple problems. In addition, they can design service and cost calculations for construction processes in building construction and civil engineering, independently solve construction costing calculations (individual costs of partial services, average wage price, etc.), carry out costing procedure comparisons and generate tender and award documents.		
	Prerequisite/s: none		

5.	Compulsory Module: Mathematics 2	h	ECTS-Credits
a.	**VO Mathematics 2**	2	2.5
b.	**UE Mathematics 2**	2	2.5
c.	**VU Probability Theory and Statistics**	2	2.5
	Total	**6**	**7.5**
	Learning Outcomes: Ad a and b: Students are able to explain and apply further fundamental topics in mathematics for an engineering degree programme (curves and surfaces, integral theorems, differential equations). They are qualified to use this knowledge to solve practical problems. Ad c: Students are able to explain descriptive and inferential statistics and apply them to practical problems.		
	Prerequisite/s: Ad a and b: none; ad c: positively passed Studies Induction and Orientation Stage		

6.	Compulsory Module: Mechanics 2	h	ECTS-Credits
a.	**VO Mechanics 2**	3	4.5
b.	**UE Mechanics 2**	2	3
	Total	**5**	**7.5**
	Learning Outcomes: Ad a and b: Students can explain the rope statics and solve elementary rope examples. They can determine the deflection and the equivalent spring stiffness of statically determinate bar structures according to Mohr's method and Castigliano's theorem. They are able to calculate the bar forces of plane and spatial trusses. They can reduce the pressure field of homogeneous and stratified liquids at rest on any container walls and determine the hydrostatic buoyancy. They are able to determine the velocity and acceleration of point masses and rigid bodies. They are able to describe the kinematics of flowing fluids in Lagrangian and Eulerian form and to apply the law of conservation of mass to flowing control volumes. They are able to apply Coulomb's law of friction and describe rope friction. They are able to apply the centre of gravity, momentum and swirl theorem to material volumes and control volumes through which a flow passes. They are able to transfer suitable oscillating systems to the model of the single-mass oscillator and analyse its dynamic response behaviour. They are able to calculate the mechanical work, power, potential and complementary energy of internal and external forces. Based on the theory of plane bending, students can determine the distortion energy of the slender bar under bending and normal force. Using the principle of virtual work, they can calculate support reactions and internal forces of statically determinate systems. They can describe the problems dealt with in the mechanics of solid and liquid bodies in a standardised way, apply them to suitable model problems and derive the underlying theories and equations.		
	Prerequisite/s: Ad a: positively passed Studies Induction and Orientation Stage; ad b.: none		

7.	Compulsory Module: Strength of Materials 1	h	ECTS-Credits
a.	**VO Strength of Materials 1**	3	4
b.	**UE Strength of Materials 1**	2	3
	Total	**5**	**7**
	Learning Outcomes: Ad a and b: Students can mathematically describe the linear-elastic behaviour of solid, deformable bodies under uniaxial and multiaxial stress and deformation states and thus select a one-, two- or three-dimensional mathematical model appropriate for the respective task. They can also select mathematical models for statically determined beam structures with linear-elastic material behaviour to determine the normal and shear stresses according to normal and shear forces as well as bending and torsional moments. Students can determine the stress and deformation state of solid, deformable bodies with linear-elastic material behaviour for specific tasks. They can also calculate the normal and shear stresses of statically determinate beam structures with linear-elastic material behaviour according to external action for specific tasks.		
	Prerequisite/s: Ad a: positively passed Studies Induction and Orientation Stage; ad b.: none		

8.	Compulsory Module: Geometric Modelling, Visualisation and CAD	h	ECTS-Credits
a.	**VO Geometric Modelling, Visualisation and CAD**	2	2.5
b.	**UE Geometric Modelling, Visualisation and CAD**	2	2.5
	Total	**4**	**5**
	Learning Outcomes: Ad a and b: Students are able to describe and analyse technical-geometric relationships using appropriate projections and geometric terms. They have a broad repertoire of computer-aided methods for the representation and modelling of geometric objects and are able to use them professionally in application contexts.		
	Prerequisite/s: none		

9.	Compulsory Module: Surveying and Road Infrastructure	h	ECTS-Credits
a.	**VO Surveying**	2	2.5
b.	**UE Surveying Calculations**	1	1.5
c.	**VO Road Infrastructure**	2	2.5
d.	**UE Road Infrastructure**	1	1.5
	Total	**6**	**8**
	Learning Outcomes: Ad a and b: Students can explain the role of surveying in civil engineering, identify surveying instruments and explain how they work. Students can solve basic trigonometric tasks, apply the first and second main geodetic tasks and carry out area calculations. They can interpret geodetic calculations and use error propagation to estimate the effect of measurement errors. They are able to use different coordinate systems and organise planning bases. They can import and export data and measurement data in standard software and list important data formats. They are able to design survey plans.		

	Ad c and d: Students are able to give an overview of road infrastructure and describe road project planning, explain the influence of vehicle characteristics and driving dynamics on road design, describe the elements of road alignment in open country (including rural roads) and the design of junctions and inner-city roads, explain the design of infrastructure for pedestrians and cyclists, describe facilities for stationary traffic and their design elements, explain the principles and methods of benefit-cost analysis, and describe the basics of road construction, equipment and maintenance. They are able to apply the basic principles of road design and use them to create the route of a road, draw up corresponding plans (site plan, longitudinal section, cross-sections) and summarise the work in a technical report.
	Prerequisite/s: Ad a and b: p positively passed Studies Induction and Orientation Stage; ad c and d: none

10.	**Compulsory Module: Mechanics 3 and Hydraulics**	**h**	**ECTS-Credits**
a.	**VO Mechanics 3**	2	2.5
b.	**UE Mechanics 3**	1	2
c.	**VU Hydraulics**	2	2.5
	Total	**5**	**7**
	Learning Outcomes: Ad a and b: Students can calculate the kinetic energy of rigid bodies and slender rods. They can select and apply the appropriate method (work theorem, energy theorem, power theorem, centre of gravity theorem, twist theorem, Lagrangian equations) to set up the equations of motion of vibrating solid body systems. They can analyse the pendulum oscillation. They are able to determine the natural frequencies, the natural modes of vibration and the amplitude-frequency response of multi-degree-of-freedom systems. They are able to explain dynamic vibration cancellation. They are able to set up the equation of motion of the Bernoulli-Euler beam and find its homogeneous solution. They can select a suitable Ritz approach for the discretisation of rods and set up the equations of motion using the Rayleigh-Ritz method and the Galerkin method. They can analyse impact problems. They can assess the stability of mechanical systems using the Dirichlet stability criterion. They can calculate velocity and pressure in stationary flowing frictionless fluids with power increase/decrease and set up the equation of motion of unsteady flowing fluids. They can calculate hydrodynamic buoyancy. They can explain the models for potential flow and viscous flow (Newtonian fluids). They can describe the problems dealt with in the mechanics of solid and liquid bodies in a standardised way, apply them to suitable model problems and derive the underlying theories and equations. Ad c: Students are able to name the fluid properties relevant to hydraulic engineering. They can describe the theoretical principles of hydrostatics and hydrodynamics with regard to the application of hydraulic engineering issues and name fundamental terms and calculation approaches in connection with pipe flows and discharges in open channels. They can apply empirical calculation approaches developed for this purpose and use them to independently solve hydraulic engineering (hydraulic) problems.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

11.	Compulsory Module: Strength of Materials 2	h	ECTS-Credits
a.	**VO Strength of Materials 2**	3	3.5
b.	**UE Strength of Materials 2**	2	3
	Total	5	**6.5**
	Learning Outcomes: Ad a and b: Students are able to differentiate between the elastic, plastic and time-dependent behaviour of solid, deformable bodies, select an appropriate mathematical model for the respective material behaviour and use it to calculate the internal forces, stresses and deformations of statically determinate and simply statically indeterminate bar structures for specific tasks, taking into account the possible stability problems with compression-loaded bars. This enables students to assess the serviceability and load-bearing capacity of statically determinate and statically indeterminate beam structures as well as the efficiency of the use of resources.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

12.	Compulsory Module: Building Physics and Materials 1	h	ECTS-Credits
a.	**VO Building Physics**	2	2.5
b.	**UE Building Physics**	2	2.5
c.	**VO Building Materials 1**	2	2.5
	Total	**6**	**7.5**
	Learning Outcomes: Ad a and b: Students are able to explain the methods for the standardised dimensioning of building components in terms of building physics and the calculation of a building's heating requirements and calculate complex examples from the specialist areas of thermal insulation, moisture protection and sound insulation. They can develop practical building solutions to improve the energy efficiency, comfort and durability of buildings. Ad c: Students are able to explain basic experimental findings and atomic models. They can classify atomic bonds and describe molecular structures as well as identify the type of atomic bonds. They can explain the morphologies resulting from the atom/molecule arrangement and their influence on material properties. They can interpret experimental observations of mechanical/thermal behaviour and relate them to processes at the atomic/molecular level. They can present simple models to describe thermo-mechanical properties and solve simple tasks on thermo-mechanical material behaviour.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

13.	Compulsory Module: Structural Analysis	h	ECTS-Credits
a.	**VO Structural Analysis**	4	7
b.	**UE Structural Analysis**	2	4
	Total	**6**	**11**
	Learning Outcomes: Ad a and b: Students are able to assess the kinematic displacement, static determinacy or indeterminacy of beam structures and identify these for specific tasks. They can select suitable calculation methods for calculating the internal forces and deformations of statically determinate and indeterminate beam structures and calculate the internal forces and deformations for specific tasks according to first or second order theory both without and with the support of a framework programme. Students can qualitatively and quantitatively determine influence lines in order to recognise favourable and unfavourable load positions. Furthermore, students can analyse the load-bearing behaviour of plane load-bearing structures and determine their internal forces, stresses and deformations. Students are able to recognise and evaluate stability problems for both beam and plane structures.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

14.	Compulsory Module: Construction Engineering and Economics 2, Hydraulic Engineering for Settlements	h	ECTS-Credits
a.	**VO Hydraulic Engineering for Settlements**	2	2.5
b.	**UE Hydraulic Engineering for Settlements**	1	1.5
c.	**VO Construction Engineering and Economics 2**	1	1.5
	Total	**4**	**5.5**
	Learning Outcomes: Ad a and b: Students are able to describe basic concepts of water resources, water extraction, water treatment as well as wastewater and rainwater and evaluate them for different framework conditions. They are able to determine basic information and carry out measurements. They can explain the principles of precipitation runoff calculation and rainwater treatment and apply them to various framework conditions. They are also able to calculate and plan supply and disposal networks and rainwater treatment systems based on static design approaches and select suitable treatment methods. They can analyse basic damage processes in urban water networks and develop suitable remediation concepts in order to react appropriately to changing climatic conditions and specific supply and disposal situations. Ad c: Students are able to explain complex construction methods and processes and plan the efficient use of construction equipment in different scenarios. They can interpret the dynamic relationships between clients and contractors and their influence on project decisions in depth. They are able to explain advanced construction management principles of tendering and awarding, cost calculation and pricing as well as construction contracts, critically discuss complex construction management and construction industry issues and develop innovative solutions for challenging problems in the construction context.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

15.	Compulsory Module: Building Construction and Materials 2	h	ECTS-Credits
a.	**VO Building Construction**	2	2.5
b.	**UE Building Construction**	2	2.5
c.	**VO Building Materials 2**	1	2
d.	**UE Building Materials 2**	2	2.5
	Total	**7**	**9.5**
	Learning Outcomes: Ad a and b: Students will be able to assess structural engineering methods, superstructures and constructions of building construction as well as various construction methods and building materials with regard to function, load and economic efficiency. They are able to analyse approval, execution and detailed plans in accordance with applicable building law for completeness and correctness, and to record and evaluate missing information. Students are able to design structural engineering superstructures and constructions in accordance with applicable standards and model them using BIM, as well as derive planning documents for the approval and execution phase of a construction project from the digital building models in accordance with regulations and standards. Students are able to use BIM-capable CAD software correctly. They are able to describe and digitally implement the necessary detailed solutions and building services equipment for buildings. Ad c and d: Students can describe the components, composition and manufacturing processes of building materials and explain the resulting building material behaviour. They can explain building material-specific chemical processes in the course of production and/or use and explain their effect on the achievable properties and durability. They can interpret characteristic values of building materials and describe (standardised) methods for determining these characteristic values. They are able to determine these characteristic values from experimental data and evaluate the results with regard to their plausibility and validity. They are able to carry out selected analyses (measurement and data evaluation) independently and to prepare and interpret the results for external parties.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

16.	Compulsory Module: Soil Mechanics	h	ECTS-Credits
a.	**VO Soil Mechanics**	2	2.5
b.	**UE Soil Mechanics**	2	3
	Total	**4**	**5.5**
	Learning Outcomes: Ad a and b: Students are able to differentiate between the most important types of soil, identify their decisive physical and mechanical properties and determine the characteristic values required for soil mechanical calculations. They are able to model the interaction of soil with groundwater, calculate groundwater flows, determine pore water pressures as well as total and effective stresses. They can model the deformation of the soil and thus calculate the settlements under a shallow foundation. They can explain the models for describing the shear strength of soils and correctly select the associated parameters depending on the boundary conditions (drained, undrained). They can differentiate between the types of earth pressure and select and calculate the appropriate one.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

17.	Compulsory Module: Hydraulic Engineering and Rail Infrastructure	h	ECTS-Credits
a.	**VO Rail Infrastructure**	2	2.5
b.	**UE Rail Infrastructure**	2	2.5
c.	**VO Constructive Hydraulic Engineering**	3	4.5
	Total	**7**	**9.5**
	Learning Outcomes: Ad a and b: Students are able to differentiate between the track-guided systems in the railway system, name the main environmentally relevant influencing parameters and critically evaluate these with regard to sustainability. They are able to explain the most important superstructure systems and dimension them for the respective application. They are able to reproduce interrelationships from a technical, economic and safety-relevant perspective. They are able to apply the principles of needs-based and environmentally friendly routing of railway lines. They are able to describe the procedures for determining the journey time and energy consumption of a train journey, assess the relevant influencing variables and calculate examples independently. They are able to apply the models for calculating load transfer in railway superstructures and analyse and evaluate their interrelationships. They are able to explain the options for effectively reducing noise and vibration emissions from railway operations and weigh up their advantages and disadvantages. With their knowledge of signalling and operations control technology, they are able to bring together the key structural and environmental aspects. They are able to explain the principles for the development of passenger and freight transport systems and to plan such systems. Ad c: Students are able to name and describe the different types of river dams and reservoirs as well as their main structural and operational components and describe the effects of hydropower plants on the flow regime. They are able to explain the essential aspects in connection with the operating and safety equipment of river and reservoirs. They are able to prepare a design for a hydropower plant under given site conditions, etc.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

18.	Compulsory Module: Timber Construction	h	ECTS-Credits
a.	**VO Timber Construction**	2	2.5
b.	**UE Timber Construction**	2	2.5
	Total	4	**5**
	Learning Outcomes: Ad a and b: Students are able to carry out and evaluate load-bearing capacity and serviceability verifications as well as simple stability analyses of load-bearing structures made of bar-shaped timber components using structural models and empirical calculation approaches in accordance with the Eurocode. In addition, they can select and design suitable fasteners.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

19.	Compulsory Module: Steel Construction	h	ECTS-Credits
a.	**VO Steel Construction**	3	5
b.	**UE Steel Construction**	2	2.5
	Total	5	**7.5**
	Learning Outcomes: Ad a and b: Students are able to design and dimension typical steel structures in building construction in accordance with current standards and carry out the necessary load analyses and structural calculations. They can differentiate between the most important materials used in steel construction and select a suitable material. You can explain the basics of safety philosophy and establish references to current design concepts. They can apply the valid regulations in a professional design and standard-compliant dimensioning. They are able to select suitable structural types and recognise and calculate the buckling lengths and buckling shapes that occur. They can identify the details occurring in these types of structures and carry out calculations.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

20.	Compulsory Module: Foundation Engineering and Project Management	h	ECTS-Credits
a.	**VO Foundation Engineering**	2	2.5
b.	**UE Foundation Engineering**	1	2
c.	**VO Project Management and Interdisciplinary Planning**	2	2.5
d.	**UE Project Management and Interdisciplinary Planning**	2	2.5
	Total	**7**	**9.5**
	Learning Outcomes: Ad a and b: Students are able to describe typical methods of foundation engineering (shallow foundations, deep foundations, soil improvement, groundwater retention, ground cracks and their securing, anchoring) and explain and apply the geotechnical models for dimensioning, such as ground failure and slope failure. They can select the parameters and characteristic values required for a calculation and thus determine the effects and resistances for various geotechnical verifications and calculate the load-bearing capacity or serviceability for geotechnical constructions. They are able to evaluate the necessary special civil engineering measures for the respective subsoil from a geotechnical point of view. Ad c and d: Students can name the basic principles of project management and project control and apply them to the planning, monitoring and control of construction projects. They are able to explain the five phases of a construction project (development, planning, preparation for execution, execution, completion) using performance and remuneration models and describe the tasks of a general planner for building construction and civil engineering. They are able to assess and apply methods for optimising construction processes and for checking specifications and planning documents. They are able to describe the construction-related roles and tasks of project control, project management and local construction supervision in accordance with applicable law and assess these in terms of cost, schedule and quality monitoring as well as quality assurance, taking into account sustainability aspects and the methods of claim and anti-claim management. They can describe the interrelationships of integral planning processes and implement effective and efficient cost and schedule planning for construction projects along the project phases in accordance with current law and performance and remuneration models. They can analyse the challenges of interdisciplinary work and develop and implement effective communication and collaboration methods in order to work successfully and in an interdisciplinary way in situ in teams using digital methods and		

	project platforms and to organise location-independent, interface-reduced communication and collaboration between all project participants.
	Prerequisite/s: positively passed Studies Induction and Orientation Stage

21.	**Compulsory Module: Solid Construction**	**h**	**ECTS-Credits**
a.	**VO Concrete Construction**	4	6
b.	**UE Concrete Construction**	2	3
c.	**VU Masonry Construction**	1	1.5
	Total	**7**	**10.5**
	Learning Outcomes: Ad a und b: Students are able to design and dimension load bearing, serviceable and durable reinforced concrete structures. They can derive and apply the basic design equations. They are able to perform the corresponding verifications for the main types of action (normal force, bending, shear force, torsion and punching load) and assign the associated crack pattern and failure mode. They can predict the stresses, crack widths and deformations occurring under service load. Ad c: Students are able to differentiate between the most important types of masonry and can name the decisive physical and mechanical properties of different brick and mortar configurations and apply them in a design. They are able to model and calculate essential masonry structures such as multi-sided walls, pillars, arches etc. They are able to explain the main types of masonry damage and their causes and design suitable repair methods.		
	Prerequisite/s: positively passed Studies Induction and Orientation Stage		

22.	**Compulsory Module: Seminar with Bachelor's Thesis**	**h**	**ECTS-Credits**
	SE Seminar with Bachelor's Thesis	1	1+9
	Total	**1**	**10**
	Learning Outcomes: Students are able to complete an independent written paper on a limited topic from the field of civil engineering that meets the requirements of good scientific practice. They can research relevant literature and discuss and analyse it on this basis. They are able to present and discuss the results of their work in front of their peers.		
	Prerequisite/s: positively passed modules Mathematics 1, Mathematics 2, Geometric Modelling, Visualisation and CAD, Mechanics 1 and Programming, Strength of Materials 1, Mechanics 2		

(2) One elective module covering altogether 13 ECTS-Credits is to be passed:

1.	Elective Module: Free Choice	h	ECTS-Credits
	Courses covering 13 ECTS-Credits are to be selected: i) Depending on the availability of places from the interdisciplinary and additional programmes offered at the University of Innsbruck and the curricula of the bachelor's or diploma programmes established at the University of Innsbruck. It is recommended that students also complete courses in the field of gender studies, women's and gender research, such as gender aspects for technical sciences and natural sciences. Furthermore the following courses are recommended: ii) ii.1) VU CAD Advanced Training Course (2 hrs, 1.5 ECTS-Credits) ii.2) VU Mathematics Advanced Training Course (2 hrs, 1.5 ECTS-Credits) ii.3) VU Mechanics Advanced Training Course (2 hrs, 1.5 ECTS-Credits) ii.4) UE Foreign Language (2 hrs, 2.5 ECTS-Credits) ii.5) SE Interdisciplinary Project (1 h, 2.5 ECTS-Credits)		13
	Total		**13**
	Learning Outcomes: Ad i: Students have additional and in-depth competences, skills and additional qualifications. They can establish the connections to their own specialist knowledge and are able to individualise and deepen their specialist profile by acquiring additional qualifications. Ad ii.1: Students are able to use a CAD system professionally and apply it constructively in technical contexts. Ad ii.2: Students can reproduce the basic knowledge of mathematics based on upper secondary level from a university point of view and solve practical problems on these topics. Ad ii.3: Students can describe the tasks of mechanics and its basic principles. They can solve kinematics problems involving rectilinear movements (e.g. laws of position/speed/time and free fall). They can reduce planar force groups from individual forces, set up and solve equilibrium conditions. They can select and apply suitable equilibrium conditions for the targeted determination of support forces and internal forces of plane statically determinate beams and trusses. Students are able to graphically represent the calculated internal forces. Ad ii.4: Students can use the chosen foreign language at the chosen level. Ad ii.5: Students are able to analyse complex problems from different technical perspectives and thus develop innovative solutions. They are able to work in teams. They can integrate different methods and approaches and present their results in a clear and structured manner. They are able to assess the relevance of interdisciplinary approaches for professional practice.		
	Prerequisite/s: Ad i) The prerequisites specified by the respective curricula are to be met; ad ii) none		

Instead of the elective module acc. to §8 para. 2, a Minor for bachelor's programmes or the respective parts may be passed, provided that places are available. Minors are fixed modules from other disciplines covering 30 ECTS-Credits. They are announced in the University of Innsbruck Bulletin.

§ 9 Bachelor's Thesis

(1) Within the scope of the Compulsory Module Seminar with Bachelor's Thesis, a Bachelor's Thesis covering 9 ECTS-Credits is to be written.

(2) The Bachelor's Thesis must be submitted in written form and/or in the electronic form specified by the Director of Studies.

§ 10 Examination regulations

(1) A module is completed by the positive evaluation of its courses.

(2) The performance of modules is evaluated by course examinations. Course examinations serve as proof of the knowledge and skills imparted in an individual course, whereby

1. in the case of courses without continuous performance evaluation, the evaluation is based on a single oral, written and/or practical exam at the end of the course. The course instructor has to announce the examination method before the start of the semester.
2. in the case of courses with continuous performance evaluation, the evaluation is based on at least two written, oral and/or practical contributions of the participants. The course instructor has to announce the examination method and the evaluation criteria before the start of the semester.

(3) Modules and courses from other study programmes are subject to the examination regulations of the curricula they are taken from.

§ 11 Academic degree

Graduates of the Bachelor's Programme in Civil Engineering are awarded the academic degree "Bachelor of Science", abbreviates as "BSc".

§ 12 Coming into force

This curriculum comes into force on 1 October 2025.

§ 13 Transitional provisions

(1) This curriculum applies to all students who start the bachelor's programme from the 2025/26 winter semester onwards.

(2) Students, who have started the Bachelor's Programme in Civil and Environmental Engineering, published in the University of Innsbruck Bulletin on 23 April 2007, Issue 35, No. 199, last change published in the University of Innsbruck Bulletin of 16 May 2018, Issue 36, No. 352, before 1 October 2025, are entitled to finish this study programme within a maximum of eight semesters from this point in time.

(3) If the bachelor's programme is not finished in time, the students are subject to the curriculum for the Bachelor's Programme in Civil Engineering. The students are also entitled to change to the curriculum for the Bachelor's Programme in Civil Engineering on a voluntary basis any time.