



Civil Engineering BSc Study Abroad Course List

Tuition-fee/credit: 110 USD

For course syllabi, please contact the Study Abroad Office!

Courses without prerequisites:

Course title	Semester	Credits (ECTS)
Engineering Mathematics 1.	Fall	4
Materials Science	Fall	2
Enterprises and Labour Market	Fall	3
Geodesy 1.	Fall	4
Mechanics 1. (Statics)	Fall	5
Fluid Mechanics in Engineering 1.	Fall	3
Geology for Civil Engineering	Fall	3
Technical Drawing 1.	Fall	4
Project Management 1.	Fall	3
Hydrology	Fall	2
Environment Protection for Engineers	Fall	2
Mechanics 2. (Dynamics)	Fall	4
Road and Railway Design 1.	Fall	4
Strengthening of Structures	Fall	3
Construction Materials 1.	Spring	5
Quality Management 1.	Spring	3
Basics of Structural Design	Spring	2
Construction Technology 1.	Spring	2
Industrial Law	Spring	3
Construction Management 1.	Spring	2
Building Services Engineering	Spring	2
Work, Fire and Health Safety	Spring	3
Road and Railway Design 2.	Spring	4
Computer Aided Structural Design 1.	Spring	2
Computer Aided Structural Design 3.	Spring	2



Courses with prerequisites for students majoring in Civil Engineering BSc:

Course title	Semester	Credits (ECTS)
Engineering Mathematics 3.	Fall	3
Geographic Information Systems 1.	Fall	2
Strength of Materials 2.	Fall	3
Fluid Mechanics in Engineering 3.	Fall	2
Steel Structures 1.	Fall	4
Reinforced Concrete Structures 1.	Fall	4
Construction Technology 2.	Fall	2
Technical drawing 3/A	Fall	2
Building Constructions 3.	Fall	3
Geotechnics 1. (Soil Mechanics)	Fall	3
Structural Analysis 2.	Fall	2
Public Utilities	Fall	2
Steel Structures 3.	Fall	4
Reinforced Concrete Structures 3.	Fall	4
Construction Management 2.	Fall	4
Building Constructions 5.	Fall	3
Underground Structures	Fall	3
Geotechnics 3. (Foundations)	Fall	4
Structural Dynamics 1.	Fall	2
Engineering Timber Structures	Fall	2
Hydraulic Engineering	Fall	5
Complex Design 1.	Fall	2
Road pavement and railway track structures	Fall	3
Computer Aided Structural Design 2.	Fall	2
Computer Aided Structural Design 4.	Fall	2
Engineering Mathematics 2.	Spring	5
Geodesy 2.	Spring	2
Strength of Materials 1.	Spring	4
Fluid Mechanics in Engineering 2.	Spring	2
Technical Drawing 2.	Spring	2
Building Constructions 2.	Spring	2
Geographic Information Systems 2.	Spring	2
Structural Analysis 1.	Spring	4
Timber and Masonry Structures	Spring	2
Planning of Water Supply and Sewerage	Spring	4



Steel Structures 2.	Spring	4
Reinforced Concrete Structures 2.	Spring	4
Construction Technology 3.	Spring	2
Building Constructions 4.	Spring	3
Geotechnics 2. (Earthworks)	Spring	2
Structural Analysis 3.	Spring	3
Water Resource Management	Spring	2
Steel-Concrete Composite Structures	Spring	2
Bridge Construction 1.	Spring	3
Construction Management 3.	Spring	2
Complex Design 2.	Spring	2

Detailed information about the courses:**Engineering Mathematics 1.**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	2 L, 2 P
Credits (ECTS):	4
Course description:	This lecture and practical based course aims to give students a solid mathematics basis through covering the following topics: sets of numbers (natural, integer, rational, real and complex numbers); vectors and operations with vectors, scalar and vector products and their applications; sets and operations with sets; matrix and determinant, solving linear equation systems definition of functions.
Assessment methods:	Examination grade
Semester:	Fall Semester



Engineering Mathematics 2.

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	2 L, 2 P
Credits (ECTS):	5
Prerequisite:	Engineering Mathematics 1.
Course description:	This lecture and practical based course aims to give students a solid mathematics basis through covering the following topics: sets of numbers (natural, integer, rational, rlecturel and complex numbers); vectors and operations with vectors, scalar and vector products and their applications; sets and operations with sets; matrix and determinant, solving linear equation systems definition of functions.
Assessment methods:	Examination grade
Semester:	Spring Semester

Engineering Mathematics 3.

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 2 P
Prerequisites:	Engineering Mathematics 2.
Credits (ECTS):	3
Course description:	This lecture and laboratory work based course aims to give engineering students a solid mathematics basis through covering the following topics: - Elements of ordinary differential equations: classification, types of solutions, analytical solution of first order, separable and linear differential equations, solution of second order incomplete and linear with constant coefficients ODEs, - Elements of probability: Classical probability: random events, experiments, sample space, computing probability with combinatorial, geometrical methods, conditional probability and independence, Bayes' theorem and the law of total probability, Random variables: discrete and continuous random variables, transformations of random variables, expectation and variance and their properties, Markov's, Chebishev's inequality, law of large numbers, central limit theorem, joint and marginal random variables, independence, covariance, correlation, - Elements of statistics: elements of descriptive statistics, commonly used quantities inferential statistics: point estimation of mean and variance, interval estimation: confidence interval for the mean in case of normal populations, statistical tests of samples, hypothesis and its alternative(s), errors, linear regression and correlation, goodness of regression by chi-square test.
Assessment methods:	exam
Semester:	Fall Semester

**Materials Science**

Language of instruction:	English
Form of teaching:	lecture
Class hours per week:	2 L
Credits (ECTS):	2
Course description:	The course provides basic knowledge about the materials structure on different, macroscopic, mesoscopic and atomic levels, destructive and non-destructive methods of studying materials. The course topics starts from the smallest entities of the material, and builds up the macroscopic objects step by step, with emphasis on how the construction materials are composed. Several novel technologies and materials are also be studied.
Assessment methods:	Semester mark
Semester:	Fall Semester

Enterprises and Labour Market

Language of instruction:	English
Form of teaching:	lecture
Class hours per week:	2 L
Credits (ECTS):	3
Course description:	The purpose of the class is to introduce the adaptability of the connection between enterprises and engineering. The most important connections between engineering innovation and organizational management and integration within labour market. Challenges and opportunities related with the a fore mentioned topics. The course focuses on the role of companies and enterprises in economy.
Assessment methods:	Semester mark
Semester:	Fall Semester

Geodesy 1.

Language of instruction:	English
Form of teaching:	Lecture, laboratory
Class hours per week:	2 L, 2 Lab
Credits (ECTS):	4
Course description:	Students are taught the geodesic activities of surveying and marking out the natural and built environment. This assists with the design, construction and operation of engineering projects.
Assessment methods:	Examination grade
Semester:	Fall Semester

**Geodesy 2.**

Language of instruction:	English
Form of teaching:	Laboratory
Class hours per week:	2 Lab
Credits (ECTS):	2
Prerequisite:	Geodesy 1.
Course description:	This module aims to reinforce the basic concepts upon which the science of geodesy is based and the mathematical tools applied. It will examine how terrestrial and increasingly space based geodetic measurements and techniques are used to define, maintain and use global and local coordinate reference systems. Students are taught the applications of industrial geodesy, and the geodesy knowledge needed for designing and setting-out engineering structures.
Assessment methods:	Semester mark
Semester:	Spring Semester

Mechanics 1. (Statics)

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 3 P
Credits (ECTS):	5
Course description:	This course aims at teaching the basics of mechanics and covers the following topics: equilibrium states and conditions of equilibrium; resultant and balance of plane force systems; defining loadbearing structures, their types and loads.
Assessment methods:	Examination grade
Semester:	Fall Semester

**Mechanics 2. (Dynamics)**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 2 P
Credits (ECTS):	4
Course description:	Introduction into the fundamentals of the dynamics - kinematics and kinetics of a particle and of the rigid body, mechanical vibrations. The aim of the course is to introduce the students into the following themes: Kinematics and kinetics of a particle. Constrained motion. Kinematics and kinetics of rigid bodies. Mass moments of inertia. Work and power theorems. Kinetic energy. Central and eccentric impact. Analysis of the free and forced vibrations with and without damping.
Assessment methods:	Examination grade
Semester:	Fall Semester

Fluid Mechanics in Engineering 1.

Language of instruction:	English
Form of teaching:	lecture
Class hours per week:	2 L
Credits (ECTS):	3
Course description:	The aim of this course is to present the basic concepts of physics that students need to know for later courses and future careers. To emphasize that physics is a tool for understanding the real world. To teach transferable problem solving skills. Physics is the branch of science that describes matter, energy, space, and time in the most fundamental level. Physicists look patterns in the physical phenomena that occur in the universe. The goal is to find the most basic laws that govern the universe and to formulate those laws in the most precise way possible.
Assessment methods:	Examination grade
Semester:	Fall Semester

**Fluid Mechanics in Engineering 2.**

Language of instruction:	English
Form of teaching:	Lecture, practice
Class hours per week:	1 L, 1 P
Credits (ECTS):	2
Prerequisite:	Fluid Mechanics in Engineering 1.
Course description:	Elementary fluid mechanics. Understanding of the fundamental principles of hydrostatics and hydrodynamics; the basic ideas of dimensioning of hydraulic structures and hydraulic machinery. Hydrostatics (absolute and relative equilibrium, pressure head diagrams and buoyancy).
Assessment methods:	Examination grade
Semester:	Spring Semester

Fluid Mechanics in Engineering 3.

Language of instruction:	English
Form of teaching:	Lecture, practice
Class hours per week:	1 L, 1 P
Credits (ECTS):	2
Prerequisite:	Fluid Mechanics in Engineering 2.
Course description:	Application of the Bernoulli equation (laminar and turbulent flow in pipes, losses and pipe systems). The impulse momentum equation, open channel flow (Chezy). Specific energy, supercritical and subcritical flow, hydraulic jump, stilling basins. Hydraulic machinery.
Assessment methods:	Examination grade
Semester:	Fall Semester

**Technical Drawing 1.**

Language of instruction:	English
Form of teaching:	Lecture, practice
Class hours per week:	2 L, 2 P
Credits (ECTS):	4
Course description:	The objective of this subject is to teach students the fundamentals of descriptive geometry, giving them practical skills through the following topics; characteristics of science, geometrical construction, theoretical sciences, basics of symbolic logic, geometrical transformation, projection representation, simple statements, representation of space structures, relations, the Monge system, universal existence, the fit, section, distance and angle of space structures.
Assessment methods:	Semester mark
Semester:	Fall Semester

Technical Drawing 2.

Language of instruction:	English
Form of teaching:	Practice
Class hours per week:	2 P
Credits (ECTS):	2
Prerequisite:	Technical Drawing 1.
Course description:	Studying of the 2D functions of AutoCAD with the help of machines drawings examples. Topics: Basic functions of AutoCAD (drawing, annotation, paper space, printing).
Assessment methods:	Semester mark
Semester:	Spring Semester

Technical Drawing 3/A

Language of instruction:	English
Form of teaching:	Practice
Class hours per week:	2 P
Prerequisite:	Technical Drawing 2.
Credits (ECTS):	2
Course description:	After studying the basic working rules of the AutoCAD software, the students will get more information about a special software for civil engineers.
Assessment methods:	Semester mark
Semester:	Fall Semester

**Project Management 1.**

Language of instruction:	English
Form of teaching:	Lecture
Class hours per week:	2 L
Credits (ECTS):	3
Course description:	The comprehensive introduction of project management and enterprise management mainly in the field of engineering. The terminology of the enterprises, study of its external and internal environment. The creation of company strategy and its role. The appearance of innovation in different projects. The course focuses on the role of construction companies and enterprises in economy.
Assessment methods:	Examination grade
Semester:	Fall Semester

Environmental Protection for Engineers

Language of instruction:	English
Form of teaching:	Lecture
Class hours per week:	2 L
Credits (ECTS):	2
Course description:	Short history of the environmental protection (EP). Concepts and fields of the EP. The regulation and the institution of the EP in Hungary. The process of pollution. The elements of the environment, its characteristics and pollution data. New fields in the EP. Global problems. Suggested solutions. Renewable energy sources.
Assessment methods:	Semester mark
Semester:	Fall Semester

Quality Management 1.

Language of instruction:	English
Form of teaching:	Lecture
Class hours per week:	2 L
Credits (ECTS):	3
Course description:	The course focuses on the concept of "quality" and the way it appears concerning products and services. The purpose of the class is to introduce the way quality oriented approach should be implemented in engineering practice. The way quality, quality assurance and quality management appears in technical development processes and in the general technological fields. How non-special innovative developing projects can be supported via professional quality-centered practices.
Assessment methods:	Examination grade
Semester:	Spring Semester

**Construction Technology 2.**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 1 P
Credits (ECTS):	2
Prerequisite:	Construction Technology 1.
Course description:	During their studies, the students acquire the technology of finishing construction processes. The main topics of the lectures are: making of ceilings, the machines of concreting works, plastering, dry construction systems, wall and floor tiling. The main topics of the practices: special earthworks, waterproofing, heating insulation, placing of cranes, site planning, site visit. During the completion of the semester task, students have to make a technology plan.
Assessment methods:	Examination grade
Semester:	Fall Semester

Construction Technology 3.

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 1 P
Credits (ECTS):	2
Prerequisite:	Construction Technology 2.
Course description:	During their studies, the students acquire the technology of ordinary and special construction processes. The main topics of the lectures are: construction of monolithic reinforced concrete structures, construction of prefabricated reinforced concrete structures, masonry, bricklaying-Technologies of pitched roofs, facades-plastering The main topics of the practices: placing of cranes, site planning, transportation of prefabricated reinforced concrete elements, site visit. During the completion of the semester task, students have to make a site plan.
Assessment methods:	Examination grade
Semester:	Spring Semester



Road and Railway Design 1.

Language of instruction:	English
Form of teaching:	Lecture, practice
Class hours per week:	2 L, 1 P
Credits (ECTS):	4
Course description:	Historical development of road transport. Characteristics of the Hungarian road network, classification of roads. Forces affecting vehicles, movements of vehicles on straight sections, curves and on slopes. Resistances, sight distances, super elevation and geometry of transition curves. Analysis of road traffic: capacity and levels of service. Phasing of horizontal and vertical alignment, design limit values, drainage. Plotting, longitudinal section, cross-section. Junctions and intersections. Road signs, traffic signals. Analysis of road accidents. Environmental issues in design and construction. Pavement structural layers, materials of earthworks and pavement layers, their qualification characteristics. Design of flexible and rigid pavements. Construction technology of road bases, intermediate and wearing courses (materials, machinery of production and construction). Quality control, laboratory testing. Maintenance of roads, elements of pavement management systems. The Trans-European road network (TEN-T) of the European Union.
Assessment methods:	Examination grade
Semester:	Fall Semester

Road and Railway Design 2.

Language of instruction:	English
Form of teaching:	Lecture, practice
Class hours per week:	2 L, 1 P
Credits (ECTS):	4
Course description:	Evolution of railway transport, its principles. Structure of the railway network (lines, stations, auxiliary tracks). Characteristics of the Hungarian railway network. Elements of railway substructure and superstructure. Rails, sleepers, rail-fixing, rail-joints. Structure and geometry of rail connections (turnouts and crossovers). Horizontal and vertical alignment of railways, tracing and lining of curves. Tracks of long rails and continuous welded rails. Railway earthworks, ballast and protecting layers in substructure. Dynamics of railway transport, load bearing capacity of railway tracks, design of superstructure. Technology of manual and mechanical rail laying. Stations and rail traffic management systems, safety issues. Maintenance of railway tracks. Quality of railway services. Urban, high-speed and special railways. Co-operation of railway networks in the European Union.
Assessment methods:	Examination grade
Semester:	Spring Semester

**Strengthening of Structures**

Language of instruction:	English
Form of teaching:	Lecture, practice
Class hours per week:	2 L, 1 P
Credits (ECTS):	3
Course description:	This course is aimed to provide basic knowledge on the principles of the repair and strengthening of structures constructed from various types of materials. Topics covered by the course include: assessment of structures, deterioration of structural materials and structures, basic principles of structural repair and strengthening, concrete and masonry repairs, methods of strengthening steel, concrete and timber structures, introduction of specific technologies such as strengthening with shotcrete, strengthening with fibre reinforced plastics (FRP), near surface reinforcing systems, design examples and case studies on strengthening bridges, buildings and other civil engineering structures.
Assessment methods:	Semester mark
Semester:	Fall Semester

Construction Management 1.

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 1 P
Credits (ECTS):	2
Course description:	During their studies, the students acquire the basic of the construction management. The main topics of the lectures are: The construction process, Technical preparation and controlling of the construction. Contracting process, The state and the environment of the construction site, Conditions of the start up and the finishing of the construction work. Handover process. Quality controlling in the construction. Health and safety requirements, Site planning of the construction, Basics of scheduling, Basics of Project Management. The main topics of the practices: Making a full 3D model about a detached house with ArchiCAD to collect the quantities of the construction materials by the list function of the software.
Assessment methods:	Examination grade
Semester:	Spring Semester

**Construction Management 2.**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	2 L, 2 P
Credits (ECTS):	4
Prerequisite:	Construction Management 1.
Course description:	During their studies, the students acquire the professional level (1) of the construction management. The main topics of the lectures are: Site planning of the construction, Construction equipment. Material supply, PM in construction industry, Cost estimation/Time schedule, Computer aided scheduling. The main topics of the practices: Cost estimating of building construction 1-2, Site plans, time schedules.
Assessment methods:	Examination grade
Semester:	Fall Semester

Construction Management 3.

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 1 P
Credits (ECTS):	2
Prerequisite:	Construction Management 2.
Course description:	During their studies, the students acquire the professional level (2) of the construction management. The main topics of the lectures are: Site planning of the construction, Construction equipment. Material supply, PM in construction industry, Cost estimation/Time schedule, Computer aided scheduling. The main topics of the practices: Time schedules
Assessment methods:	Examination grade
Semester:	Spring Semester

**Building Services Engineering**

Language of instruction:	English
Form of teaching:	lecture
Class hours per week:	2 L
Credits (ECTS):	2
Course description:	<p>This subject introduces students to the field of building services engineering and its relation to other professional fields and covers the following topics: energy consumption of buildings and location of consumption meters; space demand and location of building services equipment and centres; water supply, complete plumbing systems of buildings, cold water, hot water supply, sewerage systems, water use in architectural activities; heating technology, elements of central heating systems, energy saving in central heating; gas supply, role of gas supply and gas use in the energy supply of buildings, gas equipment in buildings, gas fittings and fixtures; renewable energy sources, passive and active utilization of solar energy; geothermal energy; handling air, cooling and air conditioning systems, loading of rooms, comfort parameters; ventilation, cooling and heating; electricity supply and networks; electrical appliances in buildings, elements of electric wiring networks of buildings.</p> <p>This subject includes an architectural design project in the practical part (marked with a P) where students can practice and further develop the content of the lectures (marked with an L).</p>
Assessment methods:	Semester mark
Semester:	Spring Semester

Work, Fire and Health Safety

Language of instruction:	English
Form of teaching:	Lecture, laboratory
Class hours per week:	2 L, 1 Lab
Credits (ECTS):	3
Course description:	<p>The fields and basics of the work safety. Institutes and regulation in Hungary and the EU. The main role of work and fire safety in the system of human. Definitions of the security system. Job hazards and hurts. Prevention of the accidents. Human health. Types of the fire and the classes of flammability. Rules of the fire safety. Methods and Equipment of the fire fighting. Important accidental and fire safety rules on the work places. Requirements of the work safety and the using of the life support system. Transport and storage of the dangerous and toxic materials. Ergonomical views and rules. Types of coveralls. First aid. The using of BLS (Basic Life Support), reanimation technics, rules and the life supporting systems.</p>
Assessment methods:	Examination grade
Semester:	Spring Semester

**Computer Aided Structural Design 1.**

Language of instruction:	English
Form of teaching:	Laboratory
Class hours per week:	2 Lab
Credits (ECTS):	2
Course description:	<p>The course will lead to the ability of preparing a structural design which is applied on the computer softwares, and will lead to their usage, the possibility of that and the logics of this usage. Tekla Structures software will be the main topic to cover in this course, by using the educational version of the software, it will be able to make the drawings for both steel and concrete parts and structures.</p> <p>Upon successful completion of this course, the student will be able to know and understand: Modelling in Tekla Structures; Drawings, Reports Creation; Export and Import 3D models to/from other softwares, and BIM environments overall.</p>
Assessment methods:	Semester mark
Semester:	Spring Semester

Computer Aided Structural Design 2.

Language of instruction:	English
Form of teaching:	Laboratory
Class hours per week:	2 Lab
Credits (ECTS):	2
Prerequisite:	Computer Aided Structural Design 1.
Course description:	<p>Preparing the students for using the common softwares in Hungary and Europe during the structural design tasks, the logical structural thinking and possibilities in the design. The course will be in assistant with the using of Tekla Structures, as it was used in the Structural Design Softwares 1. in the prior semester, where was the drawing of steel parts and assemblies and reinforced concrete structures and applications. Structural Design Softwares 2. starts from that material and further develops the knowledge of the students by presenting and applying softwares that can be effectively applied in parametric design. An insight into the use of Rhino 6 and its plug-in's will be provided, Grasshopper which is able to work closely with some of the target design softwares including FEM and detailing softwares. Other topics are also included such as Tekla Structures in connection with ConSteel and Rhino and IDEA Statica.</p>
Assessment methods:	Semester mark
Semester:	Fall Semester

**Computer Aided Structural Design 3.**

Language of instruction:	English
Form of teaching:	Laboratory
Class hours per week:	2 Lab
Credits (ECTS):	2
Course description:	Students are introduced to the theory of Computer Aided Design (CAD) and Building Information Modelling (BIM). This course aims to provide an introduction to the use of computers in civil engineering design mainly for reinforced concrete structures. For this the most suitable option is Nemetschek Allplan software which will be the main focus. Through the course the following topics will be practiced: 2D geometric construction and 3D modelling, application of materials, view generation from 3D models, reinforcement of beams, slabs, columns, walls and creation of drawing documentations.
Assessment methods:	Semester mark
Semester:	Spring Semester

Computer Aided Structural Design 4.

Language of instruction:	English
Form of teaching:	Laboratory
Class hours per week:	2 Lab
Credits (ECTS):	2
Prerequisite:	Computer Aided Structural Design 3.
Course description:	In this practical based course students will learn advanced modelling methods in Nemetschek Allplan software. The first big half of the course is about how to create own standards within the software to improve the design process to a large extent. The students will get detailed knowledge about how to create own layers/lines/patterns, a unique reinforcement/ strand/welded mesh and the programming of automatically updated lists/texts combining it with Allplans "Assistants". The other half of the course is about free 3D modelling methods which is most commonly used in precast elements in the civil engineering firm. From the completed model a detailed design documentation shall be made that includes formwork, reinforcement and cast-in fixture plans. In this way the student will learn another part of Allplans modules and can feel the efficiency of the standards by comparing the work dynamic to the previous course.
Assessment methods:	Semester mark
Semester:	Fall Semester

**Construction Materials 1.**

Language of instruction:	English
Form of teaching:	lecture, practice, laboratory
Class hours per week:	2 L, 1 P, 2 Lab
Credits (ECTS):	5
Course description:	This is an introductory overview of the various materials used in construction industry. After an introduction into the history of building materials fundamental principles of structural, physical and long-term performance of materials are presented. Special emphasis is given in the course to concrete mix design and concrete technology.
Assessment methods:	Examination grade
Semester:	Spring Semester

Geology for Civil Engineering

Language of instruction:	English
Form of teaching:	lecture, laboratory
Class hours per week:	1 L, 1 Lab
Credits (ECTS):	3
Course description:	The goal of the course is to introduce the basic knowledge of the engineering geology, become familiar with the structure of the Earth, the lithosphere material, the surface conditions and the forces shaping the rock / soil formations. Showing the exploration of the possibilities of building materials, material testing, etc. as well. The objective of the course is to study and acquire the basics of investigation and interpretation of geological phenomena in connection of Earth's crust in mutual relation of natural geological structures and/or human constructions.
Assessment methods:	Semester mark
Semester:	Fall Semester

**Hydrology**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L , 1 P
Credits (ECTS):	2
Course description:	This is an introductory course on the elements of the hydrologic cycle. The following physical processes and principles are described: the water balance equation, precipitation and its measurements, areal averages, interception, infiltration, evaporation, runoff, unit hydrograph theory, river morphology, hydrology of lakes, groundwater.
Assessment methods:	Examination grade
Semester:	Fall Semester

Strength of Materials 1.

Language of instruction:	English
Form of teaching:	lecture, practice, laboratory
Class hours per week:	1 L , 2 P, 1 Lab
Credits (ECTS):	4
Prerequisite:	Mechanics 1. (Statics)
Course description:	Students continue to learn the fundamentals of mechanics, compression and stressing of bar structures, which helps them with dimensioning basic structural components of construction and selecting the most appropriate materials. To assist with this, students learn the rules of technical and building constructional representations and various structural systems. In particular, students cover the following topics: stress and deformation, Hooke's Law, axial pre-stressing and compression of bar structures, pure shear, design of bolted joints, wooden joints, bending stress, perpendicular and oblique bending, shear stresses with simultaneous bending, eccentric stresses of materials with and without tension strength.
Assessment methods:	Examination grade
Semester:	Spring Semester

**Strength of Materials 2.**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 2 P
Credits (ECTS):	3
Course description:	Students continue to learn the fundamentals of mechanics, compression and stressing of bar structures, which helps them with dimensioning basic structural components of construction and selecting the most appropriate materials. To assist with this, students learn the rules of technical and building constructional representations and various structural systems.
Assessment methods:	Examination grade
Semester:	Fall Semester

Geotechnics 1. (Soil Mechanics)

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	2 L, 1 P
Credits (ECTS):	3
Prerequisite:	Strength of Materials 2.
Course description:	This is an introductory course on the basic and various aspects of soil mechanics. Topics covered by the course include: soil site explorations, Soil classification, Soil classification, soil consistency, soil compaction, stresses in soil, consolidation, permeability, and shear strength of soil.
Assessment methods:	Examination grade
Semester:	Fall Semester

Geotechnics 2. (Earthworks)

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 1 P
Credits (ECTS):	2
Prerequisite:	Geotechnics 1. (Soil Mechanics)
Course description:	This is an introductory course on the basic and advanced knowledge on the principles of lateral earth pressure, retaining walls, sheet-pile walls, cantilever sheet-pile walls, anchored sheet-pile walls, braced-excavation, reinforced earth, retaining walls with metallic strip reinforcement, retaining walls.
Assessment methods:	Semester mark
Semester:	Spring Semester

**Geotechnics 3. (Foundations)**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	2 L, 2 P
Credits (ECTS):	4
Prerequisite:	Geotechnics 2. (Eartworks)
Course description:	This is an introductory course on the basic and advanced knowledge on the principles and design of the different type of foundation. Topics covered by the course include: soil site explorations, bearing capacity of soil, shallow foundations, deep foundations, pile caps, soil improvement, Site Dewatering and supported deep excavation.
Assessment methods:	Examination grade
Semester:	Fall Semester

Steel Structures 1.

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	2 L, 2 P
Prerequisites:	Basics of Structural Design, Strength of Materials 1.
Credits (ECTS):	4
Course description:	The goal of the semester is that the students should learn the conventional steel structures, and should be able to solve the design of the execution drawings independently. This subject aims to provide a theoretical and practical knowledge necessary for the design, production and mounting of steel structures used in engineering and includes the following topics: definition, types and division of steel structures, their advantages and disadvantages; design principles and methodology; Eurocode 3; components of steel bars, basic materials, different joints; compressed bars; design of trusses; structural bars: classification, structural design, limit states, standard dimensions; bars and beams subject to eccentric tension or compression; bolted, riveted and welded joints; stability limit states of structural bars, turning out and plate buckling; effects of strength and stability on the behaviour of structural bars, design principles.
Assessment methods:	Examination grade
Semester:	Fall Semester



Steel Structures 2.

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 2 P
Prerequisites:	Reinforced Concrete Structures 1.
Credits (ECTS):	4
Course description:	The course provides basic knowledge on the behavior of reinforced concrete slabs and frames and introduces their design methods. The topics covered will include: introduction of reinforced concrete slab systems and frame systems, interaction of slabs and frames, approximation methods for slab and frame design, detailing according to the Eurocode 2. The students will solve design problems on selected multi-storey buildings.
Assessment methods:	Examination grade
Semester:	Spring Semester

**Steel Structures 3.**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	2 L, 2 P
Prerequisites:	Reinforced Concrete Structures 1.
Credits (ECTS):	4
Course description:	<p>The goal of the semester is that the students should learn the conventional steel structures, and should be able to solve the design of the execution drawings independently. This subject aims to provide a theoretical and practical knowledge necessary for the design, production and mounting of steel buildings used in engineering and includes the following topics: Steel buildings: Structural systems and load-bearing systems of simple steel buildings. Secondary load-bearing systems of simple steel buildings. Roofing, steel walls, sheeting, basics of strength design. Detailed elastic and plastic design of the main load-bearing structural elements: beam, columns, frames. Structural connections of the main frames': beam-to-beam, beam-to column and column-base connections (according to Eurocode 3 part 1-8). Structural solutions of bracings, sections, connections and design. Cranes in steel buildings. Multi-storey steel buildings: Static models, structural details, steel-concrete composite structural solutions. Design process and theories at multi-storey buildings. Bracing solutions. Dimensioning of bracings' elements, structural connections (welded, bolted), coverings and slab systems. Special design solutions of steel truss systems (arrangement, sections, joint solutions, analysis and strength design. Cable structures: Structural solutions, applied sections, topology, theory of design. Bracings, coverings, assembly techniques. Theoretical basis of the design of welded, class 4 cross-sectioned structural elements.</p>
Assessment methods:	Examination grade
Semester:	Fall Semester

**Structural Analysis 1.**

Language of instruction:	English
Form of teaching:	Lecture, practice, laboratory
Class hours per week:	1 L, 2 P, 1 Lab
Prerequisites:	Strength of Materials 2.
Credits (ECTS):	4
Course description:	This course aims to provide basic and advanced knowledge on the principles of the calculations of statically indeterminate plane structures. Topics covered by the course include the manual solution of statically indeterminate plane structures by the force method for frames, trusses and continuous beams. The manual solution of statically indeterminate plane structures by the displacement method for frames, trusses and continuous beams. The moment distribution (Cross) method. Determination of maximal internal forces of cross-sections. Force influence lines of statically determinate structures. 3D cases.
Assessment methods:	Examination grade
Semester:	Spring Semester

Structural Analysis 2.

Language of instruction:	English
Form of teaching:	practice, laboratory
Class hours per week:	1 P, 1 Lab
Prerequisites:	Structural Analysis 1.
Credits (ECTS):	2
Course description:	The aim of the course is to introduce the necessary basics and relationships for mastering the subject group and to provide general knowledge for the recognition and analysis of load-bearing forces in load-bearing structures. Further aim is to provide a solid basic knowledge for further technical education. During the course, students become acquainted with the behavior of statically determinate and indeterminate planar structures with a moving vehicle load. They master the process of producing maximum stress diagrams for distributed and concentrated load.
Assessment methods:	Examination grade
Semester:	Fall Semester

**Structural Analysis 3.**

Language of instruction:	English
Form of teaching:	practice, laboratory
Class hours per week:	1 P, 2 Lab
Prerequisites:	Structural Analysis 1.
Credits (ECTS):	3
Course description:	This course aims to provide basic and advanced knowledge on the principles and solution methods of the finite element method. Topics covered by the course include: General formulations and basic steps of the FEM design. Geometrical finitization, local coordinate systems, calculation of elementary matrixes, the stiffness matrix, the load vector. Controlling methods. Examples like frames, beams, grids, plates, walls, shells. Nonlinear problems. Use of an industrial code AXIS.
Assessment methods:	Examination grade
Semester:	Spring Semester

Industrial Law

Language of instruction:	English
Form of teaching:	lecture
Class hours per week:	2 L
Credits (ECTS):	3
Course description:	The course focused on topics such as the European patent system, developing IP strategies, patent search and research success stories. The programme included lectures and presentations, Q&A sessions, hands-on exercises and case studies on success stories from the field. Participation in R&D is an essential part of engineering work. Research into patents, utility model and other intellectual product databases is a prerequisite for starting research and design work. The subject is helpful for innovation activities and knowledge of intellectual property forms is essential for any engineering activity. Students get to know different forms of protection and examples of practical life. To familiarize students with the basic types of intellectual property protection, to help participate in R&D activities.
Assessment methods:	Examination grade
Semester:	Spring Semester

Basics of Structural Design

Language of instruction:	English
Form of teaching:	lecture+practice
Class hours per week:	1+1
Prerequisites:	-
Credits (ECTS):	2



Course description:	The goal of the semester is that the students should learn the theoretical background of the structural design, the basic knowledges of probability theories and the structure of the codified design through on the EuroCode Design Code system.
Assessment methods:	Participation, final test
Semester:	Spring Semester

Building Constructions 2.

Language of instruction:	English
Form of teaching:	lecture+practice
Class hours per week:	1+1
Prerequisites:	Building constructions 1.
Credits (ECTS):	2
Course description:	This subject intends to teach the following topics: requirements of building constructions; history of wall structures; walls built from solid bricks and stone, general rules of brick bounds; modern masonry materials, ceramic blocks, partition walls; lintels and openings of load-bearing wall structures; brick and stone arches, reinforced concrete joists; requirements and planning aspects of stairs, interior stairs, structural solutions for curved stairs, interior stairs made of reinforced concrete, metal and wood, stair structures of residential and public buildings, structural design of monolithic reinforced concrete stairs, stair structures made of stone and cast stone, pre-fabricated stair structures. In addition students will be introduced to the regulations and requirements structural design of ring beams, curved ceiling structures, the historical development, types and structural design of vaults. Chimneys and vents.
Assessment methods:	Participation, final test
Semester:	Spring Semester

**Planning of Water Supply and Sewerage**

Language of instruction:	English
Form of teaching:	lecture, practice
Class hours per week:	1 L, 2 P
Prerequisites:	Hydrology, Fluid Mechanics in Engineering 3.
Credits (ECTS):	4
Course description:	Basics of water supply and sewerage and their planning: Water management infrastructure (Drinking water supply, including the system of pipes, storage reservoirs, pumps, valves, filtration and treatment equipment and meters, including buildings and structures to house the equipment, used for the collection, treatment and distribution of drinking water; Sewage collection, and disposal of waste water; Drainage systems storm sewers, ditches, etc.).
Assessment methods:	Examination grade
Semester:	Spring Semester

Water Resource Management

Language of instruction:	English
Form of teaching:	lecture
Class hours per week:	2 L
Prerequisites:	Hydrology; Fluid Mechanics in Engineering 3.
Credits (ECTS):	2
Course description:	This course exposes students to an expansive suite of topics and methods within the field of Hydraulic Engineering. Types and tasks of hydraulic engineering structures with the following topics: Watershed management of lowland and hilly areas. Regulation of lakes and rivers. Reservoirs and storage. Flood control and land drainage. Inland navigation. Water power development. Water intake and pumping stations. Small hydraulic engineering structures. Characteristic environmental impacts of hydraulic engineering structures.
Assessment methods:	Examination grade
Semester:	Spring Semester