Study plan

Name of study plan: Stavitelství

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Construction Engineering
Type of study: Bachelor full-time
Required credits: 240
Elective courses credits: 0
Sum of credits in the plan: 240
Note on the plan: platí pro nástup od akad. roku 2023/24

Name of the block: Compulsory courses
Minimal number of credits of the block: 223
The role of the block: Z

Code of the group: BR20190001
Name of the group: Stavitelství, 1. semestr
Requirement credits in the group: In this group you have to gain at least 30 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
101KGR	**Constructive Geometry** *Iva Křivková, Michal Zdražil, Iva Malechová, Iva Slámová, Jozef Bobok, Hana Lakomá* ***Hana Lakomá*** *Iva Křivková (Gar.)*	Z,ZK	5	2P+2C	L,Z	z
101MAR1	**Mathematics R1** *Iva Malechová, Jozef Bobok, Jan Lamač, Milan Bořík, Yuliya Namlyeyeva, Monika Rencová* ***Aleš Nekvinda*** *Aleš Nekvinda (Gar.)*	Z,ZK	6	2P+3C	Z,L	z
122MEST	**Mechanization of construction** *Rostislav Šulc, Tomáš Váchal, Pavel Neumann, Jaroslav Synek* ***Jaroslav Synek*** *Rostislav Šulc (Gar.)*	Z,ZK	5	2P+2C	Z	z
124PSR1	**Building Structures 1R** *Ctislav Fiala, Jan Růžička, Petr Hájek, Jiří Novák, Běla Stibůrková* ***Ctislav Fiala*** *Petr Hájek (Gar.)*	Z	3	2P+1C	Z,L	z
132SMR1	**Structural Mechanics R1** *Pavel Padevět, Pavel Tesárek* ***Pavel Padevět*** *Pavel Padevět (Gar.)*	Z,ZK	5	2P+2C	Z,L	z
141HYDR	**Hydraulics** *Vojtěch Bareš, Václav Matoušek, Tomáš Picek, Petr Sklenář* ***Václav Matoušek*** *Vojtěch Bareš (Gar.)*	Z,ZK	6	2P+2C	Z	z

Characteristics of the courses of this group of Study Plan: Code=BR20190001 Name=Stavitelství, 1. semestr

101KGR	Constructive Geometry	Z,ZK	5
Projections and projective methods. Axonometry. Oblique projection. Orthogonal axonometry. Displaying prisms, cones, cylinders, pyramids, balls. Simple problems in axonometry. Basics of lighting of solids and groupes of solids. Perspective projection. Curves, parametrisation. Frenet's trihedron, torsion and curvature. Helical surfaces. Quadrics. Surfaces in building industry.			
101MAR1	Mathematics R1	Z,ZK	6
https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/MT01/			
122MEST	Mechanization of construction	Z,ZK	5
The course deals with the issue of mechanization of construction processes. It introduces the principles of construction and use of construction machinery and machinery for construction work, energy sources for machinery, machinery for main, auxiliary and service processes. The machines represent, according to the progress of work on the construction site, from preparatory and auxiliary work, to machines for earthworks, preparation and sheeting of construction pits and foundations, machines for rough construction, production, transport and processing of liquid mixtures, internal and finishing work. Gets acquainted with machines for transport and handling of materials and products. It also presents the principles of machine control using digital data, the possibilities of automation and robotics, incl. the impact of mechanization of construction work on the environment. Part of the course is to clarify the procedure for selecting suitable machine sets and the possibility of acquiring machines, issues of performance of machine sets and the principles of their choice.			

124PSR1	Building Structures 1R	Z	3
The concept of design of building structures with a comprehensive consideration of the functional requirements imposed on individual elements. Requirements for building structures, structural system, interaction of elements, spatial effect of the structural system. Vertical load-bearing structures (functions, requirements, principles of the structural design of walls, columns), floor structures (functions, requirements, principles of the structural design of vaults, wooden ceilings, reinforced concrete ceilings, ceramic concrete ceilings, steel and steel concrete ceilings). Expansion joints in load-bearing systems. Structural systems of single and multi-storey buildings, structural systems of long-span structures.			
132SMR1	Structural Mechanics R1	Z,ZK	5
1. Newton's laws, balance of forces, moments, reactions of a mass point. 2. Connections of rigid plates and material points. Calculation of rigid plate reactions. 3. Continuous loading, calculation of reactions and connections on complex systems. 4. Calculation of reactions on lattice structures. Internal forces of lattice structures, method of contact points and intersection method. 5. Internal forces on straight beams. 6. Internal forces on bent and inclined beams. 7. Reaction to the spatial cantilever and calculation of the internal forces of the spatial cantilever. 8. Internal forces on planar composite systems. 9. Calculations of the position of the center of gravity on planar figures. Moments of inertia and ellipse of inertia. 10. Stress analysis of a section loaded with normal force and moment.			
141HYDR	Hydraulics	Z,ZK	6
A Course Hydraulics (Hydraulika R) is focused on solutions of basic hydraulic problems related to a building practice. The solutions are based on an application of physical principles of behaviour of liquids (especially water) under static conditions and also under motion.			

Code of the group: BR20190002
Name of the group: Stavitelství, 2. semestr
Requirement credits in the group: In this group you have to gain at least 29 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 29
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
101MAR2	**Mathematics R2** *Iva Malechová, Jozef Bobok, Milan Bořík, Yuliya Namlyeyeva, Monika Rencová, Petr Mayer, Ivana Pultarová **Ivana Pultarová** Ivana Pultarová (Gar.)*	Z,ZK	6	2P+3C	L,Z	z
123SHR	**Building Materials R** *Miloš Jerman, Martin Keppert Martin Keppert (Gar.)*	Z,ZK	6	3P+2C	Z	z
124PSR2	**Building Structures 2R** *Ctislav Fiala, Petr Hájek, Veronika Kačmaříková, Jiří Pazderka **Jiří Pazderka** Jiří Pazderka (Gar.)*	Z,ZK	4	2P+1C	L	z
132SMR2	**Structural Mechanics R2** *Pavel Padevět, Aleš Jíra, Tomáš Janda, Zdeněk Prošek **Pavel Padevět** Pavel Padevět (Gar.)*	Z,ZK	6	2P+2C	L,Z	z
135GM01	**Geomechanics 1** *Kateřina Kovářová, Jan Jelínek, Svatoslav Chamra, Richard Malát **Kateřina Kovářová** Kateřina Kovářová (Gar.)*	Z	3	2P+1C	L	z
142VIZP	**Water and Environmental Engineering** *Michal Sněhota, Petr Nowak, Tomáš Dostál, Martin Dočkal, Martin Šanda, Pavel Fošumpaur, Bohumil Šťastný, Ladislav Satrapa, Martin Horský, ... **Filip Horký** Ladislav Satrapa (Gar.)*	Z,ZK	4	3P+1C	Z,L	z

Characteristics of the courses of this group of Study Plan: Code=BR20190002 Name=Stavitelství, 2. semestr

101MAR2	Mathematics R2	Z,ZK	6
https://mat.fsv.cvut.cz/vyuka/bakalari/eng/ls/MT02/			
123SHR	Building Materials R	Z,ZK	6
Building materials - basis course. Clasification of the materials. Structure of materials. Main properties of materials. Application of materials in building constructions. Introduction to material testing.			
124PSR2	Building Structures 2R	Z,ZK	4
Staircases, sloping ramps, lift shafts - requirements, structural and material solutions, basics of typology, design principles, construction details, railing. Building foundations - foundation conditions, types of foundations, requirements, building plinth area (construction details). Basement - solution of basement walls, requirements, protection against water, waterproofing systems. Structural expansion joints in buildings - principles of joints design in bearing structures, thermal expansion, compensation of differences in settlement, construction details. Roof truss systems.			
132SMR2	Structural Mechanics R2	Z,ZK	6
1. The principle of virtual works. 2. Calculation of deformation of structures using the principle of virtual works. 3. Betti's and Maxwell's theorem. 4. Basic principles of the force method, use of the PVP principle. 5. Calculation of internal forces on a straight beam using the force method. 6. Force method and its application to a statically indeterminate structure. 7. Reduction theorem. 8. Planar frame, calculation of internal forces using the force method. 9. Force method, lattice structures, use of symmetry. 10. Derivation of the bar stiffness matrix, principle of virtual displacements. 11. Deformation method, simplified deformation method on statically indeterminate structures. 12. Simplified deformation method (SDM) calculation of internal forces on continuous beams. 13. SDM, calculation of internal forces on planar frame structures.			
135GM01	Geomechanics 1	Z	3
The course focuses on the understanding of basic geological laws and principles in relation to architecture, civil engineering and urban planning. Emphasis is placed on explaining the influence of geological processes, both endogenous and exogenous, on the rock environment and how the geological situation affects the design of structures and their interaction with the rock environment. At the same time, attention is paid to the technical properties of rocks with regard to their practical applications. The course also includes a brief introduction to the regional geology of the Czech Republic.			
142VIZP	Water and Environmental Engineering	Z,ZK	4
During the teaching semester, students are introduced to the fields of water engineering, water management and environmental engineering. In particular, emphasis is placed on the practical aspects of water and environmental engineering in close relation to other branches of civil engineering. The course is taught in the form of lectures and tutorials. The lectures are divided thematically into 20 blocks according to the different branches of the discipline (13 times water engineering and 7 times environmental engineering). In the exercises, students work on basic problems in the field of hydrology, water supply and water structures, especially dams, hydropower and flood issues. All 4 "water" departments of K14x are involved in teaching the course.			

Code of the group: BR20190003
Name of the group: Stavitelství, 3. semestr
Requirement credits in the group: In this group you have to gain at least 28 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 28
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
122TS1	**Construction Technology L1** *Rostislav Šulc, Tomáš Váchal, Pavel Neumann, Václav Pospíchal, Mária Párová* ***Tomáš Váchal*** *Václav Pospíchal (Gar.)*	Z,ZK	5	2P+2C	Z	z
124SF1	**Building Physics 1** *Zbyněk Svoboda, Jaroslav Vychytil* ***Jaroslav Vychytil*** *Zbyněk Svoboda (Gar.)*	Z,ZK	5	2P+2C	Z	z
126BIMS	**BIM for Building Engineering** *Petr Matějka, Josef Žák* ***Josef Žák*** *Petr Matějka (Gar.)*	Z	1	1P+1C	L	z
132PRUR	**Theory of Elasticity** *Petr Fajman, Milan Jirásek* ***Petr Fajman*** *Petr Fajman (Gar.)*	Z,ZK	6	3P+2C	Z,L	z
135GM2R	**Geomechanics R2** *Jan Salák, Ivan Vaníček, Jiří Košťál* ***Ivan Vaníček*** *Jan Salák (Gar.)*	Z,ZK	4	2P+1C	Z	z
136DSUZ	**Transport Structures and Urban Planning** *Ludvík Vébr, František Pospíšil, Ondřej Bret* ***František Pospíšil*** *Ludvík Vébr (Gar.)*	Z,ZK	7	5P+1C	L,Z	z

Characteristics of the courses of this group of Study Plan: Code=BR20190003 Name=Stavitelství, 3. semestr

122TS1	Construction Technology L1	Z,ZK	5

Basic technological procedures for earthworks processes, foundations and supporting structures. Basic auxiliary structures (bracketing, formwork, scaffolding).

124SF1	Building Physics 1	Z,ZK	5

Thermal Protection of Buildings Heat transfer, Fourier laws, thermal resistance, thermal transmittance, mean thermal transmittance, energy performance of buildings, energy need for heating, energy use, primary energy, diffusion and condensation of water vapor, internal surface temperature, risk of mould growth, thermal bridges and joints. Daylighting and acoustics Solar radiation and its importance. Determining the position of the Sun in the sky using numerical and graphical methods. Insolation. Meaning of terms, requirements. Daylighting. Criteria and limits. Lighting systems. The principle of determining the daylight factor by calculation and measurement. Parts of the daylight factor. Qualitative aspect of daylighting (uniformity, direction of light incidence, etc.). Concepts of sound and noise. Criteria and limits. Acoustic quantities, symbols and calculation. Sound propagation outdoors and indoors. Sound attenuation due to aperture. Direct and diffuse sound field. Reverberation time and reverberation radius. Sound absorbing structures. Structural acoustics. Sound insulation. Sound reduction index. Impact noise. Indirect transmission.

126BIMS	BIM for Building Engineering	Z	1

The course focuses on teaching basic knowledge in the field of Building Information Management (BIM) in theoretical and practical areas, applicable across different specialisations and disciplines of the construction industry. Students will be introduced to data formats, data standards, intellectual property issues, working with digitized documents, raster and vector graphics, open data sources in the Czech Republic, ICT and enterprise systems, information systems for the construction industry, but also the context of BIM in the current construction industry in relation to the entire project life cycle and its specifics (delivery, expert focus, phases of construction projects, etc.) The theoretical knowledge is complemented by practical exercises aimed at mastering and understanding the basic principles of object-oriented parametric modelling.

132PRUR	Theory of Elasticity	Z,ZK	6

In this course, students will learn the basic principles of mechanics and their application in the calculation of stresses in members and member stability. Wall and slab typology will also be covered, including loads and basic assumptions for designing structures on the computer.

135GM2R	Geomechanics R2	Z,ZK	4

Basic course of Soil Mechanics for Civil Engineers. Introduction to origin of soils, soil description, multi-phase media behaviour, soil classification, compressibility and shear resistance, soil testing, earth pressures, assessment of stability and deformation of soil mass, applications in civil engineering.

136DSUZ	Transport Structures and Urban Planning	Z,ZK	7

The course 136DSUZ is composed of 3 issues, which build on each other and complement each other. These are the area of transport structures (roads and rail transport - scope 3+1) and the area of urban planning and spatial planning (scope 2+0). Unlike the road construction and railroad construction sections, the urban planning section does not end with credit. Transport Structures - Roads (R): Introduction to basic terminology in the part of roads, history. Road Act and related legislative and technical regulations, their impact on road design. Design categories of roads and motorways, design speed, directional and elevation design of routes, cross-sectional layout of roads and motorways, earthwork - dimensions, shapes, drainage. Urban roads, division and marking, definition of MK space, differences in design, operation and equipment. Carriageway, division, design principles. Safety equipment, junctions and crossings. Transport Structures - Rail transport (RT): Introduction to basic terminology, Issues of railway crossings from the point of view of security, design and operation. Tram transport - history, principles of tram track construction, interaction with the environment. Metro as a system of urban rail transport. Basic principles and parameters, metro lines. Railway constructions - an introduction to the design and construction of a railway track in the conditions of the Czech Republic, the basic elements of the railway superstructure. Spatial Planning (SP): Teaching spatial planning and urban planning, spatial planning tools and procedures for their acquisition.

Code of the group: BR20190004
Name of the group: Stavitelství, 4. semestr
Requirement credits in the group: In this group you have to gain at least 30 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
122TSR	**Construction Technology R** *Rostislav Šulc, Tomáš Váchal, Pavel Neumann, Mária Párová, Jan Konvalinka* ***Rostislav Šulc*** *Rostislav Šulc (Gar.)*	Z,ZK	6	3P+2C	Z	z
124KKR	**Completing Constructions** *Šárka Šilarová, Pavel Kopecký* ***Pavel Kopecký*** *Šárka Šilarová (Gar.)*	Z,ZK	6	2P+3C	Z	z
126EKMN	**Economics and Management** *Eduard Hromada, Martin Čásenský, Božena Kadeřábková, Petr Kalčev, Pavlína Píchová, Pavlína Píchová* ***Petr Kalčev*** *Eduard Hromada (Gar.)*	Z,ZK	7	4P+2C		z
133NKRB	**Load-bearing Structures Design - Concrete** *Martin Tipka, Radek Štefan* ***Martin Tipka*** *Martin Tipka (Gar.)*	Z,ZK	4	2P+1C	L,Z	z
134NKRO	**Load-bearing Structures Design - Steel** *František Wald, Michal Jandera* ***Michal Jandera*** *Martina Eliášová (Gar.)*	Z,ZK	3	2P+1C	Z,L	z
135ZSE	**Foundations E** *Josef Jettmar, Jan Kos, Jan Masopust* ***Jan Masopust*** *Jan Kos (Gar.)*	Z,ZK	4	2P+2C	Z	z

Characteristics of the courses of this group of Study Plan: Code=BR20190004 Name=Stavitelství, 4. semestr

122TSR	Construction Technology R	Z,ZK	6
124KKR	Completing Constructions	Z,ZK	6

Construction principles of the design of roof coverings for flat, sloping and steep roofs. The design of roof coverings in terms of requirements: building physical, waterproofing, operational, static, fire, acoustic, biological, chemical, lifetime and recycling. Principles of design of additional elements and details of roof coverings of flat, sloping and steep roofs based on the stated requirements and given boundary conditions. Designing and the ability to select suitable assembly structures based on the theories of design principles and the principles of solving individual groups of elements from the area of assembly structures. This involves the creation of insulation systems, windows and doors, internal dividing walls, floors and floor structures and their details.

126EKMN	Economics and Management	Z,ZK	7

The aim of the course is to provide students with an introduction to economics and management in the construction industry and to familiarize them with basic economic terms and their practical applications. Students will be prepared to solve basic construction-management problems in the construction industry. They will acquire basic information about the method of pricing construction works and master the basic methods of managing a construction company. Emphasis is placed on understanding the principle of economic thinking in relation to the construction industry.

133NKRB	Load-bearing Structures Design - Concrete	Z,ZK	4

The content of the subject are the basics of load-bearing concrete structures design with a focus on building realization and the design methodology according to valid standards, including the determination of load effects. The properties of concrete, the production and testing of concrete, the properties of concrete reinforcement and its interaction with concrete are discussed. Design and reinforcement of concrete structures for basic types of loading (bending, shear, pressure) are the main part of this course. An introduction to serviceability limit states is in the end of this course. The course follows the introductory subject of study programme (Structural Mechanics, Elasticity and Strength, Building Materials, Building Structures).

134NKRO	Load-bearing Structures Design - Steel	Z,ZK	3

The basics of designing steel, steel-concrete and wooden load-bearing structures according to applicable standards, including the determination of load effects, configuration differences due to the specific properties of individual materials.

135ZSE	Foundations E	Z,ZK	4

Úvod do předmětu, literatura, zásady navrhování, geotechnické kategorie Pevnostní a deformační charakteristiky základové půdy, plošné základy Mezní stavy plošných základů, výpočet únosnosti a sedání plošných základů Hlubinné základy - typologie, pilotové základy, technologie vrtaných a ražených pilot Osová únosnost osamělých pilot, zatěžovací zkoušky pilot Stanovení únosnosti příčně zatížených pilot, skupina pilot Mikropiloty, kotvy, technologie Injektáž klasická a trysková, podzemní stěny Stavební jámy, technologie pažení stavebních jam Zásady pro návrh a posouzení pažicích konstrukcí, zemní tlak, účinek vody Výpočet pažicích konstrukcí, metody závislých tlaků Odvodňování stavebních jam Ochrana základových konstrukcí před účinky agresivního prostředí

Code of the group: BR20190005
Name of the group: Stavitelství, 5. semestr
Requirement credits in the group: In this group you have to gain at least 30 credits
Requirement courses in the group: In this group you have to complete at least 5 courses
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
122BPPS	**Health and Safety during Project Implementation** *Tomáš Váchal, Pavel Neumann, Pavel Svoboda* ***Tomáš Váchal*** *Pavel Svoboda (Gar.)*	Z,ZK	6	3P+2C	Z	z
122ORVY	**Organization of construction** *Pavel Neumann* ***Čeněk Jarský*** *Pavel Neumann (Gar.)*	Z,ZK	6	3P+2C	Z	z
133RBZS	**Construction of Concrete and Masonry Structures** *Iva Broukalová, Petr Bílý, Michaela Frantová* ***Iva Broukalová*** *Iva Broukalová (Gar.)*	Z,ZK	6	3P+2C	Z	z
134ROD	**Steel and Timber Structures Construction** *Michal Netušil, Karel Mikeš* ***Michal Netušil*** *Michal Netušil (Gar.)*	Z,ZK	6	3P+2C	Z	z
154SG01	**Land Surveying in Civil Engineering** *Rudolf Urban, Martin Štroner* ***Rudolf Urban*** *Rudolf Urban (Gar.)*	Z,ZK	6	2P+3C	Z,L	z

Characteristics of the courses of this group of Study Plan: Code=BR20190005 Name=Stavitelství, 5. semestr

122BPPS	Health and Safety during Project Implementation	Z,ZK	6

The safety of work on the construction site is key in the conditions of the modern construction industry and precisely in relation to our integration into EU structures. The aim of the subject is to acquaint students with the currently valid legislation in the field of construction preparation and implementation. Familiarization with the role of the OSH coordinator, with the principles of OSH plan development, as a management platform for creating a safe workplace and coordinating safe work, namely in the individual segments of the implementation of civil and engineering constructions. Defining a safe workplace in terms of implementation, but also the use and maintenance of buildings. Determination of occupational risks based on the analysis of technological procedures, including the determination of PPE for the given activities. Familiarization with the safe operation of construction mechanization. Familiarization with the principles of initial training on the construction site and communication with workers in the provision of health and safety during implementation.

122ORVY	Organization of construction	Z,ZK	6

Construction of the building and investment complex - basic terms. Production process of building and object. Spatial structure of object and complex building process. Technological and time structure of object and complex construction process. Technological stages for congruent and incongruent objects. Modeling construction production. Construction technology project and its main documents, analysis and risk detection. Quality control of construction production. Environmental and health and safety plans. Public hearing of the building. Preparation and management of the construction of investment units. Designing principles of construction organization respecting the basic principles of project management. Realization of construction. Handing over and taking over the construction site, construction manager, foreman and their duties. Basic principles of the theory of flow construction, its application in practice. Modeling the construction progress using spatio-temporal graphs. Simulation of the construction process using network graphs, construction technology network graph. The use of computers in the modeling of building construction. Principles of designing construction site equipment for a building and an investment unit. Information modeling of buildings, principles and principles of BIM, use for building construction

133RBZS	Construction of Concrete and Masonry Structures	Z,ZK	6

The subject is focused on the practical designing of basic concrete structural elements, relations of the design and behaviour of structural members, reinforcing and construction technology and execution. The principles of structural design are presented with an emphasis on simplified and empirical methods. The subject also includes designing of masonry structures, an introduction to the design of bridges and engineering structures, and the basic principles of prestressed concrete elements design.

134ROD	Steel and Timber Structures Construction	Z,ZK	6

The subject is aimed on the basis of the design of steel and timber structures and their construction. Subject increases the knowledge the previous subject aimed on the basic design of elementary structural members.

154SG01	Land Surveying in Civil Engineering	Z,ZK	6

The shape and size of the Earth, substitutive surfaces, cartographic projections Horizontal and vertical control, coordinate calculations Quality control, deviations and tolerations in build-up Angle and distance measurements Heighting measurements Other geodetic methods in build-up (GNSS, DPZ, ...) Photogrammetry and laser scanning Thematic mapping and present state documentation Geodetic works in build-up State map series of CR and thematic maps for build-up Geographic information systems and spatial planning Cadastre of real estates Laws and decrees for geodesy and build-up in Czech Republic

Code of the group: BR20190006
Name of the group: Stavitelství, 6. semestr
Requirement credits in the group: In this group you have to gain at least 30 credits
Requirement courses in the group: In this group you have to complete at least 5 courses
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
122PJ1R	**Project R1** *Tomáš Váchal, Pavel Neumann, Václav Pospíchal, Ctislav Fiala, Jiří Novák, Petr Mondschein, Pavel Kopecký, Martin Tipka, Martin Králík, ...* ***Tomáš Váchal*** *Václav Pospíchal (Gar.)*	KZ	5	4C	L	z
125TZBR	**Building Services System R** *Stanislav Frolík, Daniel Adamovský, Bohumír Garlík, Karel Kabele* ***Karel Kabele*** *Karel Kabele (Gar.)*	Z,ZK	7	4P+2C	L	z
126KANR	**Costing and Bidding L** *Dana Čápová, Renáta Schneiderová Heralová, Lucie Brožová, Stanislav Vitásek* ***Lucie Brožová*** *Renáta Schneiderová Heralová (Gar.)*	Z,ZK	6	2P+3C	L	z
136RPK	**Road Structures Construction** *Petr Mondschein* ***Petr Mondschein*** *Petr Mondschein (Gar.)*	Z,ZK	6	3P+2C	Z	z
142RVS	**Realization of Water Management Structures** *Pavel Fošumpaur, Karel Kříž, Tomáš Dally* ***Karel Kříž*** *Pavel Fošumpaur (Gar.)*	Z,ZK	6	3P+2C		z

Characteristics of the courses of this group of Study Plan: Code=BR20190006 Name=Stavitelství, 6. semestr

122PJ1R	Project R1	KZ	5

According to the assigned study of a simpler building (at the level of the project for the zoning decision), the design of the supporting structure of the building in details for the execution of the building. Selection by students to focus on land, traffic or water construction

125TZBR	Building Services System R	Z,ZK	7

Basic course in building services systems - water supply, drainage, gas supply and heating systems.

126KANR	Costing and Bidding L	Z,ZK	6

The aim of the subject is to teach the student to use basic calculation techniques and procedures, to use normative and database. Another goal of the course is to teach the student pricing methods for tenders, to create a bill of quantities and a detailed estimate. Price, factors influencing price, types of prices, legislation. Valuation of building production in all stages of the project, data for valuation. Estimating, estimating basis. Hourly billing rates, bidding, software for costs estimation. Fees of project and engineering activities. Life cycle cost calculation (LCC) Data and bases for cost calculation - consumption of work and material, standards in construction. Wages and salaries. Costs and their classification, cost breakdown, common calculation methods and techniques, calculation bases. Dynamization of calculation, calculation of machine costs, individual cost calculation, calculation schema, content of individual cost components. Costs Controlling.

136RPK	Road Structures Construction	Z,ZK	6

The theoretical part of the course introduces students to materials used in road construction, their properties, testing and use. In the exercises, the knowledge of designing is deepened.

142RVS	Realization of Water Management Structures	Z,ZK	6

The course focuses on the technological procedures in the realization of water management structures. The course is divided into two parts. The first part focuses on the implementation of sanitary engineering structures and the second part explains the procedures for the implementation of hydraulic engineering structures.

Code of the group: BR20190007
Name of the group: Stavitelství, 7. semestr
Requirement credits in the group: In this group you have to gain at least 28 credits
Requirement courses in the group: In this group you have to complete at least 5 courses
Credits in the group: 28
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
122BIMP	**BIM in a Construction Praxis** *Pavel Neumann, Jaroslav Synek, Petr Zavadil, Vjačeslav Usmanov, Michal Kovářík* ***Jaroslav Synek*** *Jaroslav Synek (Gar.)*	Z,ZK	6	2P+3C		z
122ICPS	**Engineering Activities for Building Construction** *Rostislav Šulc, Tomáš Váchal, Lenka Střelbová* ***Tomáš Váchal*** *Tomáš Váchal (Gar.)*	Z,ZK	6	2P+3C	Z	z
122MKST	**Quality Management System in Construction Company** *Tomáš Váchal, Pavel Svoboda, Linda Veselá* ***Tomáš Váchal*** *Pavel Svoboda (Gar.)*	Z,ZK	6	2P+3C	Z	z
122PJ2R	**Project R2** *Rostislav Šulc, Tomáš Váchal, Pavel Neumann, Miloslava Popenková* ***Rostislav Šulc*** *Václav Pospíchal (Gar.)*	KZ	4	4C	Z	z
126STMN	**Construction Management** *Renáta Schneiderová Heralová, Zita Prostějovská, Dana Měšťanová, Jaroslava Tománková, Václav Tatýrek* ***Dana Měšťanová*** *Zita Prostějovská (Gar.)*	Z,ZK	6	3P+2C	Z,L	z

Characteristics of the courses of this group of Study Plan: Code=BR20190007 Name=Stavitelství, 7. semestr

122BIMP	BIM in a Construction Praxis	Z,ZK	6

The subject aims to learn the requirements for the effective use of BIM models of buildings in the life cycle of the building. The content of the subject is focused on the phases using completed digital models of the building, i.e. on the needs and requirements of the preparation, production and operation of the building.preparation, production and operation of the building. Part of the subject is information about applications used in the digital environment to fulfill the requirements of users of the building model.

122ICPS	Engineering Activities for Building Construction	Z,ZK	6

Basic regulations, concepts according to legal regulations, flow diagram of the preparation and authorization of the contract Building Act - performance of public administration and spatial planning Building Act - building regulations Implementing legislation to the Building Act - design phase Implementing legislation to the Building Act - permit process Implementing legislation to the Construction Act - construction Roads Act - basic provisions and special use - implementation process Rights and obligations of the client, builder, contractual relationship in variants Rights and obligations of the designer, contractual relationship in variants Air Protection Act, Waste Act and Nature and Landscape Protection Act - permit process Law on the protection of agricultural land fund, law on forests and water law - permit process Act on State Monument Care and Act on Environmental Impact Assessment - permit process Civil Code - contract

122MKST	Quality Management System in Construction Company	Z,ZK	6

Current world trends in the field of quality management: quality management system (SMK) according to EN ISO 9001, Total Quality Management (TQM) and re-engineering in application to a construction company. Analysis of quality management system processes. Forms of familiarization with the subject on specific cases based on practical experience, namely: management of the organization so that quality management and assurance is reflected in the implementation of construction e meeting customer requirements that are defined in the contract continuous improvement of the effectiveness of SMK and training in the principles of quality policy, such as: Continuous satisfaction of external and internal customer requirements; execution of works; active involvement of all staff in quality improvement; creation of conditions by the management of the organization for flawless performance of all staff; application of the latest trends in achieving high quality processes and products; effective communication and teamwork in applying the process approach of the quality management system in the organisation; all-round training of employees in order to capture the current world trend; motivation of employees by management and differentiated remuneration for the results achieved in the performance of work tasks; growth of culture in the organisation, economic prosperity and the resulting social approach of management to employees.

122PJ2R	Project R2	KZ	4

Construction technology project simulating pre-production and production preparation of the contractor

126STMN	Construction Management	Z,ZK	6

Overview of selected concepts. Methods to support project management. Legal standards, ČSN and ISO standards. The essential aspects of Project Management. Construction as a project product. Objectives, strategies, phases and surroundings of the construction project. Project manager role. Purchases and contracts in the project. Quality management, risk management. Financial management and project evaluation. Feasibility study. Cost and resource management. Change procedures. The Act on Spatial Planning and Building Regulations, the Act on the Awarding of Public Contracts, and the definition of terms. Business obligation relationships, the conclusion of contracts, their form, and use of general business conditions. Business public competition, its influence on the obligations of participants. Securing the commitment - contractual penalty, guarantee. The main contract types in construction - are contract for the conclusion of a future contract, purchase contract, contract for work, and content of the contract.

Code of the group: BR20190008
Name of the group: Stavitelství, 8. semestr
Requirement credits in the group: In this group you have to gain at least 18 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 18
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
122ROP	**Guided Professional Practice** *Rostislav Šulc **Rostislav Šulc** Rostislav Šulc (Gar.)*	Z	18	15C	L	Z

Characteristics of the courses of this group of Study Plan: Code=BR20190008 Name=Stavitelství, 8. semestr

122ROP	Guided Professional Practice	Z	18

Name of the block: Povinná tělesná výchova, sportovní kurzy
Minimal number of credits of the block: 0
The role of the block: PT

Code of the group: BTV_POV
Name of the group: Povinná tělesná výchova
Requirement credits in the group:
Requirement courses in the group: In this group you have to complete at least 2 courses
Credits in the group: 0
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
TV1	**Physical Education**	Z	0	0+2	Z	PT
TV2	**Physical Education**	Z	0	0+2	L	PT

Characteristics of the courses of this group of Study Plan: Code=BTV_POV Name=Povinná tělesná výchova

TV1	Physical Education	Z	0
TV2	Physical Education	Z	0

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 2
The role of the block: S

Code of the group: BR20230007_1
Name of the group: Stavitelství, povinně volitelný předmět
Requirement credits in the group: In this group you have to gain at least 2 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 2
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
105PRA	**Law** *Pavla Voříšková **Pavla Voříšková** Pavla Voříšková (Gar.)*	Z	2	2P	Z,L	S
105YSAS	**Sociology and Psychology** *Jitka Cirklová, Monika Dobiášová **Monika Dobiášová** Jitka Cirklová (Gar.)*	Z	2	1P+1C		S
122YTPP	**Technology of preparatory processes** *Tomáš Váchal, Mária Párová **Mária Párová** Rostislav Šulc (Gar.)*	Z	2	1P+1C	Z,L	S
122YZST	**Special construction and technology** *Michal Kovářík **Rostislav Šulc** Václav Pospíchal (Gar.)*	Z	2	1P+1C		S
124YKSD	**Complex Structural Detail** *Jiří Pazderka, Radek Zigler **Jiří Pazderka** Jiří Pazderka (Gar.)*	Z	2	1P+1C	Z	S
124YLOP	**Lightweight Building Envelope** *Lenka Hanzalová, Šárka Šilarová **Šárka Šilarová** Šárka Šilarová (Gar.)*	Z	2	1P+1C	L	S
125YNST	**HVAC and services design** *Hana Kabrhelová **Hana Kabrhelová** Hana Kabrhelová (Gar.)*	Z	2	1P+1C	Z,L	S
126YPER	**Human resource management** *Eduard Hromada, Olga Heralová **Olga Heralová** Michal Vondruška (Gar.)*	Z,ZK	2	1P+1C	L	S
126YVSF	**Small Business Management** *Olga Heralová, Jana Frková **Jana Frková** Eduard Hromada (Gar.)*	Z	2	1P+1C	Z,L	S
142YKGV	**Structural and Geotechnical Issues of Hydraulic Structures** *Miroslav Brouček **Miroslav Brouček** Miroslav Brouček (Gar.)*	Z	2	1P+1C	Z	S

144BTIS	**Trenchless technologies for underground utilities** *Karel Kříž* ***Karel Kříž*** *Karel Kříž (Gar.)*	Z	2	1P+1C	Z	S
210YDIR	*Jiří Litoš, Vladimír Šána* ***Jiří Litoš*** *Petr Konvalinka (Gar.)*	Z	2	1P+1C	Z	S

Characteristics of the courses of this group of Study Plan: Code=BR20230007_1 Name=Stavitelství, povinně volitelný předmět

105PRA	Law	Z	2
105YSAS	Sociology and Psychology	Z	2

The synthesis of selected chapters from psychology and sociology. He deals with the psychology of work and organization, managerial psychology, social psychology and the use of psychology in corporate communication. In the part of sociology, attention is focused on the sociology of the city and the region, the sociology of housing and selected themes from sociology of the company.

122YTPP	Technology of preparatory processes	Z	2

Construction manager - qualifications, financial and criminal responsibility, rights and obligations according to law and contract, processes performed by the construction manager - job description. Foreman, rights and obligations, job description. Technical supervision of the builder, construction supervision, financial and criminal responsibility. Awarding of public and other construction contracts, requirements of contracting authorities, offer of construction contracts for individual tenders Basic pre-production and production preparation of the contractor.

122YZST	Special construction and technology	Z	2

Progressive technological procedures resulting from the latest construction research. Introduction to modern technologies used in the construction of non-traditional buildings and in meeting demanding customer requirements. Special methods of production of monolithic, prefabricated and combined silicate load-bearing structures. Current technologies of monolithic structures. Special technologies of erection of steel structures. Special technologies used in the construction of new buildings as well as in the reconstruction of buildings and the protection of monuments. Progressive materials and technological procedures for interior and finishing works resulting from the latest developments in construction research.

124YKSD	Complex Structural Detail	Z	2

The aim of the course is to extend the knowledge gained in previous courses - it is intended for students who have already reached advanced level of knowledge about structural problems in buildings. The content of the course is focused on the complex solution of construction details, following all legislative requirements and taking into account the maximum efficiency and durability of the chosen solution.

124YLOP	Lightweight Building Envelope	Z	2

The subject introduces the basics needed for the design of light outer skins, glazed roofs and skylights, it is focused on material characteristics and optimal selection of glazing units, their production and application. Students are introduced to the requirements for these constructions, the design principles and design principles of these constructions, including a concrete example of a design solution and a suitable material base Students are shown the possibilities of using glass in architecture, including realized constructions.

125YNST	HVAC and services design	Z	2

Basic principles of the designing of sanitary systems, heating and ventilation. Design of the heat source, heat emitters, potable water demand, amount of ventilation air, design of air-handling unit and design of indoor systems.

126YPER	Human resource management	Z,ZK	2

Main intention is to make students familiar with practical HR management in construction company with focus on hiring, adaptation, motivation, leadership and remuneration. Within classes theory is combined with trainings (model situations).

126YVSF	Small Business Management	Z	2

The subject is divided into lectures 1 hour per week and exercises 1 hour per week. Lectures take place according to the course outline listed below. In the exercise, students prepare their own business plan for a selected business activity according to the specified syllabus. They draw up a plan for a start-up business. Entrepreneurship can take the form of both: a self-employed person and a legal entity, e.g. Ltd. The financial plan is prepared in Excel, and the credit condition is the presentation of the business plan in power point in front of the auditorium.

142YKGV	Structural and Geotechnical Issues of Hydraulic Structures	Z	2

The course introduces the specifics, risks and design challenges in the design, implementation, operation and repair of water works through examples of failures or construction of water works in the Czech Republic and abroad. The course includes a detailed discussion of successfully applied methods for the rehabilitation of failures of fill and concrete dams and their substructure

144BTIS	Trenchless technologies for underground utilities	Z	2

The subject is focused on a basic clarification of individual trenchless methods for the laying and rehabilitation of underground utilities. Within the lectures, the benefits and applicability in specific conditions, suitability for individual applications, requirements for construction readiness, and their limits and risks are discussed for individual methods. As part of the exercises, there are specific real cases implemented variant proposals of methods.

210YDIR		Z	2

Basics of experimental measurement and instrumentation of testing structures. Theory of experimental work, measurements, data exploatation and processing of results. Structures and principal behavior of testing devices, tenzometers, inductive senzors etc. Static and dynamic loading testing of structures and their parts. Destructive and nondestructive testing methods. Diagnostics of civil engineering structures. Excursion on site or on the building structure. Concept of management of quality, system of quality of the building firms, phase of control of the quality of the projects, building process and finished structures. Acreditation process of the testing laboratories. Certification of the quality systems of production and certification of products.

Name of the block: Jazyky
Minimal number of credits of the block: 3
The role of the block: J

Code of the group: BF20190201_J
Name of the group: Povinně volitelný jazyk, 2. semestr
Requirement credits in the group: In this group you have to gain at least 1 credit
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 1
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
104YCA1	**English 1** *Karolína Synková, Alexandra Steinerová, Elena Dačeva, Jarmila Fučíková, Sandra Giormani, Hana Horká, Petra Martincová, Věra Čermáková, Michaela Németh, ...* ***Svatava Boboková Bartíková*** *Sandra Giormani (Gar.)*	Z	1	2C	Z,L	J
104YCN1	**German 1** *Svatava Boboková Bartíková* ***Svatava Boboková Bartíková*** *Svatava Boboková Bartíková (Gar.)*	Z	1	2C	Z,L	J

Characteristics of the courses of this group of Study Plan: Code=BF20190201_J Name=Povinně volitelný jazyk, 2. semestr

104YCA1	English 1	Z	1

English 1 Course code: 104Y CA1 Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit The aim of the compulsory English course is to enhance the knowledge of lexis and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on professional language (i.e., ESP - technical style) and communicative competence within the construction industry. The course also seeks to teach students to read technical literature and to be able to produce essential written discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a credit. Literature: Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 1 - 5)

104YCN1	German 1	Z	1

The compulsory course - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, understanding professional texts, and learning the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature: A.Hanáková, J.Dressel: Deutsch im Bauwesen

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Code of the group: BF20190302_J
Name of the group: Povinně volitelný jazyk, 3. semestr
Requirement credits in the group: In this group you have to gain at least 2 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 2
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
104YC2A	**English 2** *Karolína Synková, Alexandra Steinerová, Elena Dačeva, Jarmila Fučíková, Sandra Giormani, Hana Horká, Petra Martincová, Věra Čermáková, Michaela Németh, ...* ***Svatava Boboková Bartíková*** *Sandra Giormani (Gar.)*	Z,ZK	2	2C		J
104YC2N	**German 2** *Svatava Boboková Bartíková* ***Svatava Boboková Bartíková*** *Svatava Boboková Bartíková (Gar.)*	Z,ZK	2	2C		J

Characteristics of the courses of this group of Study Plan: Code=BF20190302_J Name=Povinně volitelný jazyk, 3. semestr

104YC2A	English 2	Z,ZK	2

English 2 Course code: 104YC2A Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit and exam The aim of the compulsory English course is to enhance the knowledge of lexis and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on professional language (i.e., ESP - technical style) and communicative competence within the construction industry. The course also seeks to teach students to read technical literature and to be able to produce essential written discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a credit and an examination. Literature: Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 6 10)

104YC2N	German 2	Z,ZK	2

The compulsory course - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, understanding professional texts, and learning the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature: A.Hanáková, J.Dressel: Deutsch im Bauwesen

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Name of the block: Povinně volitelné předměty, doporučení S1
Minimal number of credits of the block: 12
The role of the block: S1

Code of the group: BR20190008_1
Name of the group: Stavitelství, bakalářská práce
Requirement credits in the group: In this group you have to gain at least 12 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 12
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
122BAPR	**Bachelor Thesis** *Pavel Svoboda* ***Tomáš Váchal*** *Rostislav Šulc (Gar.)*	Z	12	10C	L,Z	S1
124BAPR	**Bachelor Thesis** *Lenka Hanzalová, Jaroslav Vychytil* ***Petr Hájek***	Z	12	10C	L,Z	S1
125BAPR	**Bachelor Thesis** ***Stanislav Frolík*** *Stanislav Frolík (Gar.)*	Z	12	10C	L,Z	S1
126BAPR	**Bachelor Thesis** *Eduard Hromada, Daniel Macek* ***Eduard Hromada*** *Daniel Macek (Gar.)*	Z	12	10C	L,Z	S1
133BAPR	**Bachelor Thesis** ***Lukáš Vráblík***	Z	12	10C	L,Z	S1
134BAPR	**Bachelor Thesis** *Jakub Dolejš* ***Jakub Dolejš*** *Jakub Dolejš (Gar.)*	Z	12	10C	L,Z	S1
136BAPR	**Bachelor Thesis** ***Michal Uhlík*** *Petr Mondschein (Gar.)*	Z	12	10C	L,Z	S1
137BAPR	**Bachelor Thesis** *Vít Lojda* ***Vít Lojda*** *Vít Lojda (Gar.)*	Z	12	10C	L,Z	S1
141BAPR	**Bachelor Thesis**	Z	12	10C	L,Z	S1
142BAPR	**Bachelor Thesis** *Pavel Fošumpaur, Tomáš Dally, Jitka Kučerová* ***Pavel Fošumpaur***	Z	12	10C	L,Z	S1
143BAPR	**Bachelor Project** *Michal Sněhota, Tomáš Dostál, Martin Dočkal, Martin Šanda, Milena Císlerová, Václav David, Petr Kavka, Petr Koudelka, Josef Krása, ...* ***Martin Šanda*** *Tomáš Dostál (Gar.)*	Z	12	10C	L,Z	S1
210BAPR	**Bachelor Thesis** *Jiří Litoš, Pavel Reiterman* ***Jiří Litoš***	Z	12	10C	L,Z	S1

Characteristics of the courses of this group of Study Plan: Code=BR20190008_1 Name=Stavitelství, bakalářská práce

122BAPR	Bachelor Thesis	Z	12
124BAPR	Bachelor Thesis	Z	12
The topics of bachelor's theses are based on the needs of practice or the scientific research activities of the department, scope and difficulty correspond to the student's knowledge acquired during bachelor's studies. The supervisor of the bachelor's thesis can designate additional consultants to the student.			
125BAPR	Bachelor Thesis	Z	12
Bachelor Thesis is the result of the Bachelor degree study programme. It should prove student`s ability to work independently in the area of Building Services Systems. The thesis can cover theoretical aspects or to focus on practical application on an object within building services systems. Students consult the supervisor and specialists from other departments. The thesis is presented in front of the commission.			
126BAPR	Bachelor Thesis	Z	12
The bachelor thesis finishes the bachelor study. A student proves that he/she is able to apply the knowledge acquired in the study on the real project. The bachelor thesis connects to the chosen subjects of the study curricula. The partial results are further evaluated and appropriate conclusions are drawn. For students of branch R.			
133BAPR	Bachelor Thesis	Z	12
A bachelor thesis is the qualification thesis of a bachelor's degree. It can take the form of processing the structural design project or research study on the topic of designing and application of a structural element with a variant comparative analysis or parametric study or performing and analysing experiments, etc.			
134BAPR	Bachelor Thesis	Z	12
In this course, student formulates a bachelor's thesis that is necessary to reach the bachelor's degree.			
136BAPR	Bachelor Thesis	Z	12
The assigned topic of bachelor theses can be a project, traffic surveys, research of selected issues with application in practice for various technical solutions of road structures, laboratory tests to verify the functionality of various materials for pavements, etc. In terms of design, the most common topics of theses are, for example, the design of a new construction or reconstruction of a selected section of a road (bypass, flyover), the design of a road network in a selected area of the city, the design of a new construction or reconstruction of intersections, the design of an airport, heliport, etc. In terms of pavement structures and road construction technologies, the most frequent topics of work are, for example, comparison of different material solutions for asphalt or concrete pavements, including the relevant composite materials or input components (binders, aggregates, etc.), assessment of the behaviour of a particular material or type of structure by laboratory methods, or carrying out simulations, etc.			
137BAPR	Bachelor Thesis	Z	12
A bachelor's thesis is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are: learning to work with literature, processing professional text, citation standards, etc. execution and evaluation of specified laboratory tests).			
141BAPR	Bachelor Thesis	Z	12
Preparation of a bachelor thesis in the field of hydraulics, hydrology, water flows or flood protection solutions.			
142BAPR	Bachelor Thesis	Z	12
The course includes individual work of the student and consultations related to the work on the bachelor thesis.			
143BAPR	Bachelor Project	Z	12
Final thesis of bachelor study usually is a continuation of study and pre-diploma seminar. Student selects the topic from offer given by selected department. In close cooperation with responsible supervisor, student works on chosen topic.			
210BAPR	Bachelor Thesis	Z	12
Students will get the opportunity to organize complex process of experimental work from the beginning of production, experimental investigation to of the data. Thesis are designed to fit scientific and research activity of the Experimental Centre.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
101KGR	Constructive Geometry	Z,ZK	5
	Projections and projective methods. Axonometry. Oblique projection. Orthogonal axonometry. Displaying prisms, cones, cylinders, pyramids, balls. Simple problems in axonometry. Basics of lighting of solids and groupes of solids. Perspective projection. Curves, parametrisation. Frenet's trihedron, torsion and curvature. Helical surfaces. Quadrics. Surfaces in building industry.		
101MAR1	Mathematics R1	Z,ZK	6
	https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/MT01/		
101MAR2	Mathematics R2	Z,ZK	6
	https://mat.fsv.cvut.cz/vyuka/bakalari/eng/ls/MT02/		
104YC2A	English 2	Z,ZK	2
	English 2 Course code: 104YC2A Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit and exam The aim of the compulsory English course is to enhance the knowledge of lexis and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on professional language (i.e., ESP - technical style) and communicative competence within the construction industry. The course also seeks to teach students to read technical literature and to be able to produce essential written discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a credit and an examination. Literature: Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 6 10)		
104YC2N	German 2	Z,ZK	2
	The compulsory course - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, understanding professional texts, and learning the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature: A.Hanáková, J.Dressel: Deutsch im Bauwesen		
104YCA1	English 1	Z	1
	English 1 Course code: 104Y CA1 Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit The aim of the compulsory English course is to enhance the knowledge of lexis and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on professional language (i.e., ESP - technical style) and communicative competence within the construction industry. The course also seeks to teach students to read technical literature and to be able to produce essential written discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a credit. Literature: Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 1 - 5)		
104YCN1	German 1	Z	1
	The compulsory course - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, understanding professional texts, and learning the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature: A.Hanáková, J.Dressel: Deutsch im Bauwesen		
105PRA	Law	Z	2
105YSAS	Sociology and Psychology	Z	2
	The subject is conceived as a synthesis of selected chapters from psychology and sociology. He deals with the psychology of work and organization, managerial psychology, social psychology and the use of psychology in corporate communication. In the part of sociology, attention is focused on the sociology of the city and the region, the sociology of housing and selected themes from sociology of the company.		
122BAPR	Bachelor Thesis	Z	12
122BIMP	BIM in a Construction Praxis	Z,ZK	6
	The subject aims to learn the requirements for the effective use of BIM models of buildings in the life cycle of the building. The content of the subject is focused on the phases using completed digital models of the building, i.e. on the needs and requirements of the preparation, production and operation of the building.preparation, production and operation of the building. Part of the subject is information about applications used in the digital environment to fulfill the requirements of users of the building model.		
122BPPS	Health and Safety during Project Implementation	Z,ZK	6
	The safety of work on the construction site is key in the conditions of the modern construction industry and precisely in relation to our integration into EU structures. The aim of the subject is to acquaint students with the currently valid legislation in the field of construction preparation and implementation. Familiarization with the role of the OSH coordinator, with the principles of OSH plan development, as a management platform for creating a safe workplace and coordinating safe work, namely in the individual segments of the implementation of civil and engineering constructions. Defining a safe workplace in terms of implementation, but also the use and maintenance of buildings. Determination of occupational risks based on the analysis of technological procedures, including the determination of PPE for the given activities. Familiarization with the safe operation of construction mechanization. Familiarization with the principles of initial training on the construction site and communication with workers in the provision of health and safety during implementation.		
122ICPS	Engineering Activities for Building Construction	Z,ZK	6
	Basic regulations, concepts according to legal regulations, flow diagram of the preparation and authorization of the contract Building Act - performance of public administration and spatial planning Building Act - building regulations Implementing legislation to the Building Act - design phase Implementing legislation to the Building Act - permit process Implementing legislation to the Construction Act - construction Roads Act - basic provisions and special use - implementation process Rights and obligations of the client, builder, contractual relationship in variants Rights and obligations of the designer, contractual relationship in variants Air Protection Act, Waste Act and Nature and Landscape Protection Act - permit process Law on the protection of agricultural land fund, law on forests and water law - permit process Act on State Monument Care and Act on Environmental Impact Assessment - permit process Civil Code - contract		
122MEST	Mechanization of construction	Z,ZK	5
	The course deals with the issue of mechanization of construction processes. It introduces the principles of construction and use of construction machinery and machinery for construction work, energy sources for machinery, machinery for main, auxiliary and service processes. The machines represent, according to the progress of work on the construction site, from preparatory and auxiliary work, to machines for earthworks, preparation and sheeting of construction pits and foundations, machines for rough construction, production, transport and processing of liquid mixtures, internal and finishing work. Gets acquainted with machines for transport and handling of materials and products. It also presents the principles of machine control using digital data, the possibilities of automation and robotics, incl. the impact of mechanization of construction work on the environment. Part of the course is to clarify the procedure for selecting suitable machine sets and the possibility of acquiring machines, issues of performance of machine sets and the principles of their choice.		
122MKST	Quality Management System in Construction Company	Z,ZK	6
	Current world trends in the field of quality management: quality management system (SMK) according to EN ISO 9001, Total Quality Management (TQM) and re-engineering in application to a construction company. Analysis of quality management system processes. Forms of familiarization with the subject on specific cases based on practical experience, namely: management of the organization so that quality management and assurance is reflected in the implementation of construction e meeting customer requirements that are defined in the contract continuous improvement of the effectiveness of SMK and training in the principles of quality policy, such as: Continuous satisfaction of external and internal customer		

requirements; execution of works; active involvement of all staff in quality improvement; creation of conditions by the management of the organization for flawless performance of all staff; application of the latest trends in achieving high quality processes and products; effective communication and teamwork in applying the process approach of the quality management system in the organisation; all-round training of employees in order to capture the current world trend; motivation of employees by management and differentiated remuneration for the results achieved in the performance of work tasks; growth of culture in the organisation, economic prosperity and the resulting social approach of management to employees.

122ORVY	Organization of construction	Z,ZK	6

Construction of the building and investment complex - basic terms. Production process of building and object. Spatial structure of object and complex building process. Technological and time structure of object and complex construction process. Technological stages for congruent and incongruent objects. Modeling construction production. Construction technology project and its main documents, analysis and risk detection. Quality control of construction production. Environmental and health and safety plans. Public hearing of the building. Preparation and management of the construction of investment units. Designing principles of construction organization respecting the basic principles of project management. Realization of construction. Handing over and taking over the construction site, construction manager, foreman and their duties. Basic principles of the theory of flow construction, its application in practice. Modeling the construction progress using spatio-temporal graphs. Simulation of the construction process using network graphs, construction technology network graph. The use of computers in the modeling of building construction. Principles of designing construction site equipment for a building and an investment unit. Information modeling of buildings, principles and principles of BIM, use for building construction

122PJ1R	Project R1	KZ	5

According to the assigned study of a simpler building (at the level of the project for the zoning decision), the design of the supporting structure of the building in details for the execution of the building. Selection by students to focus on land, traffic or water construction

122PJ2R	Project R2	KZ	4

Construction technology project simulating pre-production and production preparation of the contractor

122ROP	Guided Professional Practice	Z	18
122TS1	Construction Technology L1	Z,ZK	5

Basic technological procedures for earthworks processes, foundations and supporting structures. Basic auxiliary structures (bracketing, formwork, scaffolding).

122TSR	Construction Technology R	Z,ZK	6
122YTPP	Technology of preparatory processes	Z	2

Construction manager - qualifications, financial and criminal responsibility, rights and obligations according to law and contract, processes performed by the construction manager - job description. Foreman, rights and obligations, job description. Technical supervision of the builder, construction supervision, financial and criminal responsibility. Awarding of public and other construction contracts, requirements of contracting authorities, offer of construction contracts for individual tenders Basic pre-production and production preparation of the contractor.

122YZST	Special construction and technology	Z	2

Progressive technological procedures resulting from the latest construction research. Introduction to modern technologies used in the construction of non-traditional buildings and in meeting demanding customer requirements. Special methods of production of monolithic, prefabricated and combined silicate load-bearing structures. Current technologies of monolithic structures. Special technologies of erection of steel structures. Special technologies used in the construction of new buildings as well as in the reconstruction of buildings and the protection of monuments. Progressive materials and technological procedures for interior and finishing works resulting from the latest developments in construction research.

123SHR	Building Materials R	Z,ZK	6

Building materials - basis course. Clasification of the materials. Structure of materials. Main properties of materials. Application of materials in building constructions. Introduction to material testing.

124BAPR	Bachelor Thesis	Z	12

The topics of bachelor's theses are based on the needs of practice or the scientific research activities of the department, scope and difficulty correspond to the student's knowledge acquired during bachelor's studies. The supervisor of the bachelor's thesis can designate additional consultants to the student.

124KKR	Completing Constructions	Z,ZK	6

Construction principles of the design of roof coverings for flat, sloping and steep roofs. The design of roof coverings in terms of requirements: building physical, waterproofing, operational, static, fire, acoustic, biological, chemical, lifetime and recycling. Principles of design of additional elements and details of roof coverings of flat, sloping and steep roofs based on the stated requirements and given boundary conditions. Designing and the ability to select suitable assembly structures based on the theories of design principles and the principles of solving individual groups of elements from the area of assembly structures. This involves the creation of insulation systems, windows and doors, internal dividing walls, floors and floor structures and their details.

124PSR1	Building Structures 1R	Z	3

The concept of design of building structures with a comprehensive consideration of the functional requirements imposed on individual elements. Requirements for building structures, structural system, interaction of elements, spatial effect of the structural system. Vertical load-bearing structures (functions, requirements, principles of the structural design of walls, columns), floor structures (functions, requirements, principles of the structural design of vaults, wooden ceilings, reinforced concrete ceilings, ceramic concrete ceilings, steel and steel concrete ceilings). Expansion joints in load-bearing systems. Structural systems of single and multi-storey buildings, structural systems of long-span structures.

124PSR2	Building Structures 2R	Z,ZK	4

Staircases, sloping ramps, lift shafts - requirements, structural and material solutions, basics of typology, design principles, construction details, railing. Building foundations - foundation conditions, types of foundations, requirements, building plinth area (construction details). Basement - solution of basement walls, requirements, protection against water, waterproofing systems. Structural expansion joints in buildings - principles of joints design in bearing structures, thermal expansion, compensation of differences in settlement, construction details. Roof truss systems.

124SF1	Building Physics 1	Z,ZK	5

Thermal Protection of Buildings Heat transfer, Fourier laws, thermal resistance, thermal transmittance, mean thermal transmittance, energy performance of buildings, energy need for heating, energy use, primary energy, diffusion and condensation of water vapor, internal surface temperature, risk of mould growth, thermal bridges and joints. Daylighting and acoustics Solar radiation and its importance. Determining the position of the Sun in the sky using numerical and graphical methods. Insolation. Meaning of terms, requirements. Daylighting. Criteria and limits. Lighting systems. The principle of determining the daylight factor by calculation and measurement. Parts of the daylight factor. Qualitative aspect of daylighting (uniformity, direction of light incidence, etc.). Concepts of sound and noise. Criteria and limits. Acoustic quantities, symbols and calculation. Sound propagation outdoors and indoors. Sound attenuation due to aperture. Direct and diffuse sound field. Reverberation time and reverberation radius. Sound absorbing structures. Structural acoustics. Sound insulation. Sound reduction index. Impact noise. Indirect transmission.

124YKSD	Complex Structural Detail	Z	2

The aim of the course is to extend the knowledge gained in previous courses - it is intended for students who have already reached advanced level of knowledge about structural problems in buildings. The content of the course is focused on the complex solution of construction details, following all legislative requirements and taking into account the maximum efficiency and durability of the chosen solution.

124YLOP	Lightweight Building Envelope	Z	2

The subject introduces the basics needed for the design of light outer skins, glazed roofs and skylights, it is focused on material characteristics and optimal selection of glazing units, their production and application. Students are introduced to the requirements for these constructions, the design principles and design principles of these constructions, including a concrete example of a design solution and a suitable material base Students are shown the possibilities of using glass in architecture, including realized constructions.

125BAPR	Bachelor Thesis	Z	12
Bachelor Thesis is the result of the Bachelor degree study programme. It should prove student`s ability to work independently in the area of Building Services Systems. The thesis can cover theoretical aspects or to focus on practical application on an object within building services systems. Students consult the supervisor and specialists from other departments. The thesis is presented in front of the commission.			
125TZBR	Building Services System R	Z,ZK	7
Basic course in building services systems - water supply, drainage, gas supply and heating systems.			
125YNST	HVAC and services design	Z	2
Basic principles of the designing of sanitary systems, heating and ventilation. Design of the heat source, heat emitters, potable water demand, amount of ventilation air, design of air-handling unit and design of indoor systems.			
126BAPR	Bachelor Thesis	Z	12
The bachelor thesis finishes the bachelor study. A student proves that he/she is able to apply the knowledge acquired in the study on the real project. The bachelor thesis connects to the chosen subjects of the study curricula. The partial results are further evaluated and appropriate conclusions are drawn. For students of branch R.			
126BIMS	BIM for Building Engineering	Z	1
The course focuses on teaching basic knowledge in the field of Building Information Management (BIM) in theoretical and practical areas, applicable across different specialisations and disciplines of the construction industry. Students will be introduced to data formats, data standards, intellectual property issues, working with digitized documents, raster and vector graphics, open data sources in the Czech Republic, ICT and enterprise systems, information systems for the construction industry, but also the context of BIM in the current construction industry in relation to the entire project life cycle and its specifics (delivery, expert focus, phases of construction projects, etc.) The theoretical knowledge is complemented by practical exercises aimed at mastering and understanding the basic principles of object-oriented parametric modelling.			
126EKMN	Economics and Management	Z,ZK	7
The aim of the course is to provide students with an introduction to economics and management in the construction industry and to familiarize them with basic economic terms and their practical applications. Students will be prepared to solve basic construction-management problems in the construction industry. They will acquire basic information about the method of pricing construction works and master the basic methods of managing a construction company. Emphasis is placed on understanding the principle of economic thinking in relation to the construction industry.			
126KANR	Costing and Bidding L	Z,ZK	6
The aim of the subject is to teach the student to use basic calculation techniques and procedures, to use normative and database. Another goal of the course is to teach the student pricing methods for tenders, to create a bill of quantities and a detailed estimate. Price, factors influencing price, types of prices, legislation. Valuation of building production in all stages of the project, data for valuation. Estimating, estimating basis. Hourly billing rates, bidding, software for costs estimation. Fees of project and engineering activities. Life cycle cost calculation (LCC) Data and bases for cost calculation - consumption of work and material, standards in construction. Wages and salaries. Costs and their classification, cost breakdown, common calculation methods and techniques, calculation bases. Dynamization of calculation, calculation of machine costs, individual cost calculation, calculation schema, content of individual cost components. Costs Controlling.			
126STMN	Construction Management	Z,ZK	6
Overview of selected concepts. Methods to support project management. Legal standards, ČSN and ISO standards. The essential aspects of Project Management. Construction as a project product. Objectives, strategies, phases and surroundings of the construction project. Project manager role. Purchases and contracts in the project. Quality management, risk management. Financial management and project evaluation. Feasibility study. Cost and resource management. Change procedures. The Act on Spatial Planning and Building Regulations, the Act on the Awarding of Public Contracts, and the definition of terms. Business obligation relationships, the conclusion of contracts, their form, and use of general business conditions. Business public competition, its influence on the obligations of participants. Securing the commitment - contractual penalty, guarantee. The main contract types in construction - are contract for the conclusion of a future contract, purchase contract, contract for work, and content of the contract.			
126YPER	Human resource management	Z,ZK	2
Main intention is to make students familiar with practical HR management in construction company with focus on hiring, adaptation, motivation, leadership and remuneration. Within classes theory is combined with trainings (model situations).			
126YVSF	Small Business Management	Z	2
The subject is divided into lectures 1 hour per week and exercises 1 hour per week. Lectures take place according to the course outline listed below. In the exercise, students prepare their own business plan for a selected business activity according to the specified syllabus. They draw up a plan for a start-up business. Entrepreneurship can take the form of both: a self-employed person and a legal entity, e.g. Ltd. The financial plan is prepared in Excel, and the credit condition is the presentation of the business plan in power point in front of the auditorium.			
132PRUR	Theory of Elasticity	Z,ZK	6
In this course, students will learn the basic principles of mechanics and their application in the calculation of stresses in members and member stability. Wall and slab typology will also be covered, including loads and basic assumptions for designing structures on the computer.			
132SMR1	Structural Mechanics R1	Z,ZK	5
1. Newton's laws, balance of forces, moments, reactions of a mass point. 2. Connections of rigid plates and material points. Calculation of rigid plate reactions. 3. Continuous loading, calculation of reactions and connections on complex systems. 4. Calculation of reactions on lattice structures. Internal forces of lattice structures, method of contact points and intersection method. 5. Internal forces on straight beams. 6. Internal forces on bent and inclined beams. 7. Reaction to the spatial cantilever and calculation of the internal forces of the spatial cantilever. 8. Internal forces on planar composite systems. 9. Calculations of the position of the center of gravity on planar figures. Moments of inertia and ellipse of inertia. 10. Stress analysis of a section loaded with normal force and moment.			
132SMR2	Structural Mechanics R2	Z,ZK	6
1. The principle of virtual works. 2. Calculation of deformation of structures using the principle of virtual works. 3. Betti's and Maxwell's theorem. 4. Basic principles of the force method, use of the PVP principle. 5. Calculation of internal forces on a straight beam using the force method. 6. Force method and its application to a statically indeterminate structure. 7. Reduction theorem. 8. Planar frame, calculation of internal forces using the force method. 9. Force method, lattice structures, use of symmetry. 10. Derivation of the bar stiffness matrix, principle of virtual displacements. 11. Deformation method, simplified deformation method on statically indeterminate structures. 12. Simplified deformation method (SDM) calculation of internal forces on continuous beams. 13. SDM, calculation of internal forces on planar frame structures.			
133BAPR	Bachelor Thesis	Z	12
A bachelor thesis is the qualification thesis of a bachelor's degree. It can take the form of processing the structural design project or research study on the topic of designing and application of a structural element with a variant comparative analysis or parametric study or performing and analysing experiments, etc.			
133NKRB	Load-bearing Structures Design - Concrete	Z,ZK	4
The content of the subject are the basics of load-bearing concrete structures design with a focus on building realization and the design methodology according to valid standards, including the determination of load effects. The properties of concrete, the production and testing of concrete, the properties of concrete reinforcement and its interaction with concrete are discussed. Design and reinforcement of concrete structures for basic types of loading (bending, shear, pressure) are the main part of this course. An introduction to serviceability limit states is in the end of this course. The course follows the introductory subject of study programme (Structural Mechanics, Elasticity and Strength, Building Materials, Building Structures).			

133RBZS	Construction of Concrete and Masonry Structures	Z,ZK	6
The subject is focused on the practical designing of basic concrete structural elements, relations of the design and behaviour of structural members, reinforcing and construction technology and execution. The principles of structural design are presented with an emphasis on simplified and empirical methods. The subject also includes designing of masonry structures, an introduction to the design of bridges and engineering structures, and the basic principles of prestressed concrete elements design.			
134BAPR	Bachelor Thesis	Z	12
In this course, student formulates a bachelor's thesis that is necessary to reach the bachelor's degree.			
134NKRO	Load-bearing Structures Design - Steel	Z,ZK	3
The basics of designing steel, steel-concrete and wooden load-bearing structures according to applicable standards, including the determination of load effects, configuration differences due to the specific properties of individual materials.			
134ROD	Steel and Timber Structures Construction	Z,ZK	6
The subject is aimed on the basis of the design of steel and timber structures and their construction. Subject increases the knowledge the previous subject aimed on the basic design of elementary structural members.			
135GM01	Geomechanics 1	Z	3
The course focuses on the understanding of basic geological laws and principles in relation to architecture, civil engineering and urban planning. Emphasis is placed on explaining the influence of geological processes, both endogenous and exogenous, on the rock environment and how the geological situation affects the design of structures and their interaction with the rock environment. At the same time, attention is paid to the technical properties of rocks with regard to their practical applications. The course also includes a brief introduction to the regional geology of the Czech Republic.			
135GM2R	Geomechanics R2	Z,ZK	4
Basic course of Soil Mechanics for Civil Engineers. Introduction to origin of soils, soil description, multi-phase media behaviour, soil classification, compressibility and shear resistance, soil testing, earth pressures, assessment of stability and deformation of soil mass, applications in civil engineering.			
135ZSE	Foundations E	Z,ZK	4
Úvod do předmětu, literatura, zásady navrhování, geotechnické kategorie Pevnostní a deformační charakteristiky základové půdy, plošné základy Mezní stavy plošných základů, výpočet únosnosti a sedání plošných základů Hlubinné základy - typologie, pilotové základy, technologie vrtaných a ražených pilot Osová únosnost osamělých pilot, zatěžovací zkoušky pilot Stanovení únosnosti příčně zatížených pilot, skupina pilot Mikropiloty, kotvy, technologie Injektáž klasická a trysková, podzemní stěny Stavební jámy, technologie pažení stavebních jam Zásady pro návrh a posouzení pažicích konstrukcí, zemní tlak, účinek vody Výpočet pažicích konstrukcí, metody závislých tlaků Odvodňování stavebních jam Ochrana základových konstrukcí před účinky agresivního prostředí			
136BAPR	Bachelor Thesis	Z	12
The assigned topic of bachelor theses can be a project, traffic surveys, research of selected issues with application in practice for various technical solutions of road structures, laboratory tests to verify the functionality of various materials for pavements, etc. In terms of design, the most common topics of theses are, for example, the design of a new construction or reconstruction of a selected section of a road (bypass, flyover), the design of a road network in a selected area of the city, the design of a new construction or reconstruction of intersections, the design of an airport, heliport, etc. In terms of pavement structures and road construction technologies, the most frequent topics of work are, for example, comparison of different material solutions for asphalt or concrete pavements, including the relevant composite materials or input components (binders, aggregates, etc.), assessment of the behaviour of a particular material or type of structure by laboratory methods, or carrying out simulations, etc.			
136DSUZ	Transport Structures and Urban Planning	Z,ZK	7
The course 136DSUZ is composed of 3 issues, which build on each other and complement each other. These are the area of transport structures (roads and rail transport - scope 3+1) and the area of urban planning and spatial planning (scope 2+0). Unlike the road construction and railroad construction sections, the urban planning section does not end with credit. Transport Structures - Roads (R): Introduction to basic terminology in the part of roads, history. Road Act and related legislative and technical regulations, their impact on road design. Design categories of roads and motorways, design speed, directional and elevation design of routes, cross-sectional layout of roads and motorways, earthwork - dimensions, shapes, drainage. Urban roads, division and marking, definition of MK space, differences in design, operation and equipment. Carriageway, division, design principles. Safety equipment, junctions and crossings. Transport Structures - Rail transport (RT): Introduction to basic terminology, Issues of railway crossings from the point of view of security, design and operation. Tram transport - history, principles of tram track construction, interaction with the environment. Metro as a system of urban rail transport. Basic principles and parameters, metro lines. Railway constructions - an introduction to the design and construction of a railway track in the conditions of the Czech Republic, the basic elements of the railway superstructure. Spatial Planning (SP): Teaching spatial planning and urban planning, spatial planning tools and procedures for their acquisition.			
136RPK	Road Structures Construction	Z,ZK	6
The theoretical part of the course introduces students to materials used in road construction, their properties, testing and use. In the exercises, the knowledge of designing is deepened.			
137BAPR	Bachelor Thesis	Z	12
A bachelor's thesis is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are: learning to work with literature, processing professional text, citation standards, etc. execution and evaluation of specified laboratory tests).			
141BAPR	Bachelor Thesis	Z	12
Preparation of a bachelor thesis in the field of hydraulics, hydrology, water flows or flood protection solutions.			
141HYDR	Hydraulics	Z,ZK	6
A Course Hydraulics (Hydraulika R) is focused on solutions of basic hydraulic problems related to a building practice. The solutions are based on an application of physical principles of behaviour of liquids (especially water) under static conditions and also under motion.			
142BAPR	Bachelor Thesis	Z	12
The course includes individual work of the student and consultations related to the work on the bachelor thesis.			
142RVS	Realization of Water Management Structures	Z,ZK	6
The course focuses on the technological procedures in the realization of water management structures. The course is divided into two parts. The first part focuses on the implementation of sanitary engineering structures and the second part explains the procedures for the implementation of hydraulic engineering structures.			
142VIZP	Water and Environmental Engineering	Z,ZK	4
During the teaching semester, students are introduced to the fields of water engineering, water management and environmental engineering. In particular, emphasis is placed on the practical aspects of water and environmental engineering in close relation to other branches of civil engineering. The course is taught in the form of lectures and tutorials. The lectures are divided thematically into 20 blocks according to the different branches of the discipline (13 times water engineering and 7 times environmental engineering). In the exercises, students work on basic problems in the field of hydrology, water supply and water structures, especially dams, hydropower and flood issues. All 4 "water" departments of K14x are involved in teaching the course.			
142YKGV	Structural and Geotechnical Issues of Hydraulic Structures	Z	2
The course introduces the specifics, risks and design challenges in the design, implementation, operation and repair of water works through examples of failures or construction of water works in the Czech Republic and abroad. The course includes a detailed discussion of successfully applied methods for the rehabilitation of failures of fill and concrete dams and their substructure			
143BAPR	Bachelor Project	Z	12
Final thesis of bachelor study usually is a continuation of study and pre-diploma seminar. Student selects the topic from offer given by selected department. In close cooperation with responsible supervisor, student works on chosen topic.			

144BTIS	Trenchless technologies for underground utilities	Z	2
The subject is focused on a basic clarification of individual trenchless methods for the laying and rehabilitation of underground utilities. Within the lectures, the benefits and applicability in specific conditions, suitability for individual applications, requirements for construction readiness, and their limits and risks are discussed for individual methods. As part of the exercises, there are specific real cases implemented variant proposals of methods.			
154SG01	Land Surveying in Civil Engineering	Z,ZK	6
The shape and size of the Earth, substitutive surfaces, cartographic projections Horizontal and vertical control, coordinate calculations Quality control, deviations and tolerations in build-up Angle and distance measurements Heighting measurements Other geodetic methods in build-up (GNSS, DPZ, ...) Photogrammetry and laser scanning Thematic mapping and present state documentation Geodetic works in build-up State map series of CR and thematic maps for build-up Geographic information systems and spatial planning Cadastre of real estates Laws and decrees for geodesy and build-up in Czech Republic			
210BAPR	Bachelor Thesis	Z	12
Students will get the opportunity to organize complex process of experimental work from the beginning of production, experimental investigation to of the data. Thesis are designed to fit scientific and research activity of the Experimental Centre.			
210YDIR		Z	2
Basics of experimental measurement and instrumentation of testing structures. Theory of experimental work, measurements, data exploatation and processing of results. Structures and principal behavior of testing devices, tenzometers, inductive senzors etc. Static and dynamic loading testing of structures and their parts. Destructive and nondestructive testing methods. Diagnostics of civil engineering structures. Excursion on site or on the building structure. Concept of management of quality, system of quality of the building firms, phase of control of the quality of the projects, building process and finished structures. Acreditation process of the testing laboratories. Certification of the quality systems of production and certification of products.			
TV1	Physical Education	Z	0
TV2	Physical Education	Z	0

For updated information see http://bilakniha.cvut.cz/en/FF.html
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