Study plan

Name of study plan: Stavební inženýrství, specializace Konstrukce a dopravní stavby

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Civil 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: tento studijní plán platí od akademického roku 2020/21

Name of the block: Compulsory courses
Minimal number of credits of the block: 117
The role of the block: Z

Code of the group: BJ20190100
Name of the group: Stavební inženýrství, varianta J, 1. 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
101KG01	**Constructive Geometry** *Iva Křivková, Iva Malechová, Michal Zdražil, Iva Slámová, Hana Lakomá, Petra Vacková, Jana Čápová, Jozef Bobok* ***Jana Čápová*** *Iva Křivková (Gar.)*	Z,ZK	5	2P+2C	Z,L	z
101MA01	**Mathematics 1** *Iva Malechová, Iva Slámová, Petra Vacková, Jana Čápová, Jozef Bobok, Michal Beneš, Ivana Pultarová, Ondřej Zindulka, Jan Chleboun, ...* ***Aleš Nekvinda*** *Aleš Nekvinda (Gar.)*	Z,ZK	6	2P+3C	Z,L	z
105SVAI	**Social Sciences and Architecture** *Josef Záruba Pfeffermann, Bořivoj Marek, Rudolf Pošva, Dana Římanová, Jana Hrbková* ***Josef Záruba Pfeffermann*** *Josef Záruba Pfeffermann (Gar.)*	Z,ZK	5	4P+1C	L	z
123CHE	**Chemistry** *Jana Nábělková, Martin Keppert, Milena Pavlíková* ***Milena Pavlíková*** *Milena Pavlíková (Gar.)*	Z,ZK	4	3P+1C	L	z
132SM01	**Structural Mechanics 1** *Michal Polák, Daniel Rypl, Matěj Lepš, Jan Sýkora, Tomáš Koudelka, Aleš Palička, Karel Pohl, Tomáš Plachý, Martin Válek, ...* ***Matěj Lepš*** *Michal Polák (Gar.)*	Z,ZK	6	2P+2C	Z,L	z
135GM01	**Geomechanics 1** *Kateřina Kovářová, Jan Jelínek, Svatoslav Chamra, Richard Malát* ***Kateřina Kovářová*** *Kateřina Kovářová (Gar.)*	Z	3	2P+1C	L	z

Characteristics of the courses of this group of Study Plan: Code=BJ20190100 Name=Stavební inženýrství, varianta J, 1. semestr

101KG01	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.			
101MA01	Mathematics 1	Z,ZK	6
https://mat.fsv.cvut.cz/bubenik/mat1detail.htm			
105SVAI	Social Sciences and Architecture	Z,ZK	5
The subject combines the teaching of several social sciences: economics and economic policies, political science, political philosophy and law, with an overview of the development of architecture. In the section devoted to economics, the basic categories of the market economy, the foundations of economic policy and the basic concepts of international economics are explained. Theoretical interpretation is effectively combined with practical examples from economic reality. In the lectures devoted to law, a brief overview of the development of Roman law and its institutions is supplemented by a well-founded interpretation of the constitution, human rights and the labor code. Great attention is paid to selected provisions of the Civil Code and the Construction Act. In the political science lectures, the political development in ancient times is described in an engaging way, the theory of the state, political systems, democracy and totalitarianism are clarified. The series of lectures on the history of architecture and construction provides a comprehensive interpretation of the history of architecture from antiquity to postmodernism and deconstruction.			

123CHE	Chemistry	Z,ZK	4
Introduction to general chemistry - chemical bond, compounds, reactions, equilibrium. Chemistry of environment - water, atmosphere, pedosphere. Chemistry of building materials - inorganic binders, glass, ceramic, metals, natural polymers, wood, synthetic polymers on C and Si basis. Introduction to degradation of building materials and to analytical chemistry.			
132SM01	Structural Mechanics 1	Z,ZK	6
Concurrent forces, force systems acting on rigid bodies in space/plane, moment of a force about a point and line. Supports of a rigid body, reaction forces. Compound two-dimensional structures. Trusses. Reaction forces applying the principle of virtual work.			
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.			

Code of the group: BJ20190200
Name of the group: Stavební inženýrství, varianta J, 2. 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
101MA02	**Mathematics 2** *Iva Malechová, Iva Slámová, Hana Lakomá, Petra Vacková, Jana Čápová, Jozef Bobok, Michal Beneš, Ivana Pultarová, Ondřej Zindulka, ...* ***Ivana Pultarová*** *Ivana Pultarová (Gar.)*	Z,ZK	6	2P+3C	L,Z	z
102FYI	**Physics** *Pavel Novák, Tomáš Zbíral, Jiří Konfršt, Petr Pokorný, Jan Trejbal, Pavel Demo, Jiří Novák* ***Pavel Novák*** *Pavel Novák (Gar.)*	Z,ZK	4	3P+1C	L	z
123SH01	**Building Materials** *Alena Vimmrová, Eva Vejmelková, Miloš Jerman* ***Alena Vimmrová*** *Alena Vimmrová (Gar.)*	Z,ZK	5	2P+2C	Z,L	z
126BIM1	**BIM** *Petr Matějka, Josef Žák* ***Josef Žák*** *Josef Žák (Gar.)*	Z	1	1P+1C	Z	z
132SM02	**Structural Mechanics 2** *Michal Polák, Daniel Rypl, Matěj Lepš, Jan Sýkora, Tomáš Koudelka, Aleš Palička, Martin Válek, Jitka Němečková, Šimon Glanc, ...* ***Michal Polák*** *Michal Polák (Gar.)*	Z,ZK	6	2P+2C	L,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=BJ20190200 Name=Stavební inženýrství, varianta J, 2. semestr

101MA02	Mathematics 2	Z,ZK	6
https://mat.fsv.cvut.cz/vyuka/bakalari/eng/ls/MT02/			
102FYI	Physics	Z,ZK	4
This is a basic physics course for students of the study programmes Civil Engineering; Management and Economics in Construction. The course focuses on mechanics and basic thermodynamics. The following areas are covered in the course: Mechanics of material points (particles) and deformable bodies. Discrete and continuous model of matter. Kinematics and dynamics of a material point (particle). Mechanical force fields. Gravitational field. Mechanical vibrations. Material deformation. Elastic waves. Acoustics. Hydromechanics. Fundamentals of thermodynamics. Heat transfer.			
123SH01	Building Materials	Z,ZK	5
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.			
126BIM1	BIM	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.			
132SM02	Structural Mechanics 2	Z,ZK	6
Internal forces diagrams of simple statically determinate plane structures and compound two-dimensional structures. Multiaxially loaded cantilever. Definition of normal stress and prepositions of its distribution in a cross section. Equivalence of internal forces. Geometry of mass and areas, centre of gravity and moments of inertia.			
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: BJ20190300
Name of the group: Stavební inženýrství, varianta J, 3. 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
101MA03	**Mathematics 3** *Iva Malechová, Jozef Bobok, Michal Beneš, Ondřej Zindulka, Petr Kučera, Zdeněk Skalák, Martin Hála, Martin Soukenka, Petr Mayer, ...* ***Michal Beneš*** *Michal Beneš (Gar.)*	Z,ZK	6	3P+2C	Z,L	z
124PSI1	**Building Structures 1I** *Ctislav Fiala, Jan Růžička, Petr Hájek, Jaroslav Vychytil, Běla Stibůrková* ***Jan Růžička*** *Petr Hájek (Gar.)*	Z	4	2P+1C	Z	z
132PRPE	**Strength of Materials** *Petr Kabele, Michal Šejnoha, Milan Jirásek, Jan Vorel, Eva Novotná, Martin Doškář, Martin Horák, Martin Lebeda, Barbora Hálková, ...* ***Milan Jirásek*** *Petr Kabele (Gar.)*	Z,ZK	6	3P+2C	Z,L	z
135GM2I	**Geomechanics 2I** *Jan Salák, Jiří Košťál, Martin Vaníček, Ivan Vaníček* ***Ivan Vaníček*** *Jan Salák (Gar.)*	Z,ZK	5	2P+1C	Z	z
141HYA	**Hydraulics** *Michal Dohnal, Aleš Havlík, Tomáš Picek, Václav Matoušek, Petr Sklenář, Martin Fencl, Anna Špačková, Jakub Novotný, Vojtěch Bareš, ...* ***Václav Matoušek*** *Michal Dohnal (Gar.)*	Z,ZK	5	2P+2C	Z,L	z
142VIZP	**Water and Environmental Engineering** *Aleš Havlík, Martin Fencl, Michal Sněhota, Petr Nowak, Tomáš Dostál, Martin Dočkal, Martin Šanda, Pavel Fošumpaur, Bohumil Šťastný, ...* ***Martin Horský*** *Ladislav Satrapa (Gar.)*	Z,ZK	4	3P+1C	Z,L	z

Characteristics of the courses of this group of Study Plan: Code=BJ20190300 Name=Stavební inženýrství, varianta J, 3. semestr

101MA03	Mathematics 3	Z,ZK	6
https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/			
124PSI1	Building Structures 1I	Z	4
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.			
132PRPE	Strength of Materials	Z,ZK	6
Fundamentals of the theory of elasticity: stress and strain of straight beams subjected to bending and free torsion, ultimate plastic capacity of a member in bending, critical loads and buckling lengths of straight compression members. Basic assumptions, quantities, and equations describing the stress and strain state in 3D continuum, plates and walls.			
135GM2I	Geomechanics 2I	Z,ZK	5
Formation of soils, basic properties of soils, water in soil, strength and deformation properties of soils and their determination, improvement of soil properties, application tasks			
141HYA	Hydraulics	Z,ZK	5
A course deals with issues of hydrostatics and hydrodynamics with aiming at civil engineering applications. There are analysed tasks related to hydrostatic and hydrodynamic loading of structures, pipeline flow, open channel flow and groundwater flow.			
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: BJ20190400
Name of the group: Stavební inženýrství, varianta J, 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
124PSI2	**Building Structures 2I** *Ctislav Fiala, Petr Hájek, Malila Noori, Veronika Kačmaříková, Jaroslav Vychytil, Tereza Pavlů, Jiří Pazderka, Jiří Nováček* ***Jiří Pazderka*** *Jiří Pazderka (Gar.)*	Z,ZK	4	2P+1C	L	z
126EKMN	**Economics and Management** *Eduard Hromada, Martin Časenský, Božena Kadeřábková, Petr Kalčev, Pavlína Píchová, Pavlína Píchová* ***Eduard Hromada*** *Eduard Hromada (Gar.)*	Z,ZK	7	4P+2C		z
132SM3	**Structural Mechanics 3** *Tomáš Koudelka, Petr Kabele, Michal Šejnoha, Milan Jirásek, Jan Vorel, Eva Novotná, Martin Horák, Michal Šmejkal, Tomáš Krejčí, ...* ***Aleš Jíra*** *Petr Kabele (Gar.)*	Z,ZK	5	2P+2C	L,Z	z

133NNKB	**Fundamentals of Structural Design - Concrete** *Martin Tipka, Radek Štefan, Jitka Vašková* ***Martin Tipka*** *Martin Tipka (Gar.)*	Z,ZK	4	2P+1C	L,Z	Z
134NNKO	**Design of Supporting StructuresI - Steel** *František Wald, Michal Jandera, Martina Eliášová* ***Martina Eliášová*** *Martina Eliášová (Gar.)*	Z,ZK	3	2P+1C	L	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=BJ20190400 Name=Stavební inženýrství, varianta J, 4. semestr

124PSI2	Building Structures 2I	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.

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.

132SM3	Structural Mechanics 3	Z,ZK	5

Deformation and force method for the solution of reactions and internal forces on statically indeterminate beams, frames, and truss structures. Calculation of displacements of beams, frames, and truss structures using the principle of virtual works.

133NNKB	Fundamentals of Structural Design - Concrete	Z,ZK	4

The content of the subject are the basics of load-bearing concrete structures design 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 Civil Engineering program (Structural Mechanics, Elasticity and Strength, Building Materials, Building Structures).

134NNKO	Design of Supporting StructuresI - 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, design differences due to the specific properties of individual materials.

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.

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 89
The role of the block: P

Code of the group: BK202005
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, 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**
132ANKC	**Analysis of Structures** *Aleš Jíra, Dagmar Jandeková, Petr Konvalinka, Jan Zatloukal* ***Petr Konvalinka*** *Petr Konvalinka (Gar.)*	Z,ZK	5	2P+2C	Z	P
133BK01	**Concrete and Masonry Structures 1** *Martin Tipka, Jitka Vašková, Petr Bílý* ***Petr Bílý*** *Petr Bílý (Gar.)*	Z,ZK	6	3P+2C	Z	P
134OK01	**Steel Structures 1** *Michal Jandera* ***Michal Jandera*** *Michal Jandera (Gar.)*	Z,ZK	6	3P+2C	Z	P
135ZS01	**Foundations 1** *Jiří Barták, Jan Masopust* ***Jan Pruška*** *Jan Kos (Gar.)*	Z,ZK	7	3P+3C	Z	P
136SS01	**Road Structures 1** *Ludvík Vébr, Petr Mondschein, Michal Uhlík* ***Ludvík Vébr*** *Ludvík Vébr (Gar.)*	Z,ZK	6	3P+2C	Z	P

Characteristics of the courses of this group of Study Plan: Code=BK202005 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, 5.semestr

132ANKC	Analysis of Structures	Z,ZK	5
Analyses of statically determinate and statically/deformable indeterminate structures, concerning live loads solution, stresses in thin-wall beams, analysis of walls and plates, matrix formulation of deformation method, principles of FEM, models for a beam on elastic foundation and stability of structures.			
133BK01	Concrete and Masonry Structures 1	Z,ZK	6
The subject is focused on the design of concrete elements and constructions of multi-storey buildings - it follows on from the subject Fundamentals of Structural Design. The content of the course is the addition and generalization of procedures for verifying the load-bearing capacity of reinforced concrete structural elements for cases of bending, shear, a combination of biaxial bending and normal force, designing elements stressed by torsion, punching shear, assessment of slender compressed elements. Design procedures are discussed for individual types of structures, including the choice of suitable calculation models and calculation methods and reinforcement principles.			
134OK01	Steel Structures 1	Z,ZK	6
The course OK01 aims to expand the knowledge acquired in the subject NNK and concerning design of basic steel structures. In the theoretical part are delivered possibilities of global analysis of structures including classification from view of necessities of nonlinear analyses. Design of steel elements is widen for global analysis methods, advanced composite steel and concrete beams/columns and cold-formed thin-walled elements. The main part of the subject deals with complex design of multi-storey steel buildings and steel industrial halls. Final lectures concern large-span structures, uniqueness in design of tall buildings, including effects of seismicity.			
135ZS01	Foundations 1	Z,ZK	7
Introduction to the subject, literature, design principles, geotechnical categories Strength and deformation characteristics of foundation soils, slab foundations Limit states of flat foundations, calculation of bearing capacity and settlement of flat foundations Deep foundations - typology, pile foundations, drilled and driven pile technology Axial capacity of isolated piles, pile load tests Determination of bearing capacity of transversely loaded piles, pile group Micropiles, anchors, technology Conventional and jet grouting, underground walls Construction pits, technology of shoring of construction pits Principles for the design and assessment of shoring structures, earth pressure, water effect Calculation of shoring structures, pressure dependent methods Dewatering of construction pits Protection of foundation structures against the effects of aggressive environments			
136SS01	Road Structures 1	Z,ZK	6
Law about roads, protection zones, components and accessories, use, drivability and passability. Introduction to traffic engineering, movement of an individual vehicle - basic dynamic characteristics. Traffic flow and its characteristics, traffic intensity and its monitoring, communication capacity and traffic quality. Capacity of intersections, level of service, theory of time gaps, negative effects of traffic. Routing principles, area of interest, directional solution, directional curves - division, application, layout scheme. Height solution. Longitudinal, transverse and resultant slope. Tilting of the roadway - types, requirements, ascents and descents, tilting of the earth plain. Road objects. Technical and technical-economic assessment, multi-criteria assessment, earthwork, distribution of materials and materials. Roadway - design of rigid and non-rigid roadway construction, computational assessment and optimization of non-rigid roadway. Urban roads - differences between urban roads and roads, space requirements - pedestrians, cyclists, disabled people - barrier-free adaptations. Traffic surveys - breakdown, types, progress, prospective intensities, recalculation of intensities, special surveys. turntables, switches. Parking, traffic areas, contour curves, traffic area solutions including drainage. Traffic calming at urban roads - principle, methods, examples.			

Code of the group: BK202006
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, 6. 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 5 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
132DY01	**Dynamics of structures 1** *Karel Pohl, Tomáš Krejčí, Jiří Máca, Kristian D'Amico* ***Jiří Máca*** *Jiří Máca (Gar.)*	Z,ZK	5	2P+2C	L	P
133BK02	**Concrete and Masonry Structures 2** *Jitka Vašková, Iva Broukalová, Michal Drahorád, Marek Foglar* ***Marek Foglar*** *Marek Foglar (Gar.)*	Z,ZK	7	4P+2C	L	P
134DK01	**Timber Structures 1** *Petr Kuklík, Anna Kuklíková, Lukáš Velebil* ***Anna Kuklíková*** *Jakub Dolejš (Gar.)*	Z,ZK	5	3P+1C	L	P
136SS02	**Road construction 2** *Petr Mondschein* ***Petr Mondschein*** *Petr Mondschein (Gar.)*	Z,ZK	5	2P+2C	L	P
137ZE01	**Railway Structures 1** *Hana Krejčiříková, Leoš Horníček* ***Leoš Horníček*** *Martin Lidmila (Gar.)*	Z,ZK	7	4P+2C	L	P

Characteristics of the courses of this group of Study Plan: Code=BK202006 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, 6. semestr

132DY01	Dynamics of structures 1	Z,ZK	5
Principles of theory of vibration, dynamic loading. Free and forced vibration of single-degree-of-freedom systems. Damped vibration. Methods of dynamic analysis of muti-degreee-of-freeedom systems.			
133BK02	Concrete and Masonry Structures 2	Z,ZK	7
This course builds on the courses NNK and BK01 and widens the knowledge to the necessary minimum for the bachalor studium branches C and K. 1.-3.Masonry structures - subjected to compression, bending, shear, reinforced masonry, strenghtening of masonry structures 4.- 6. Design of concrete structures to serviceability limit states: stress limitation, crack development and crack width limitation, deflections, application on waterproof structures 7.-8.Introduction to pre-stressed concrete: design of pre-stressing, losses of pre-stressing, technology 9.-12. Pre-cast concrete structures 13. Bridges: nomenclature in bridges, cross-section arrangement, loading, construction methods, Introduction to engineering structures			
134DK01	Timber Structures 1	Z,ZK	5
Introduction and presentation of timber structures use in building industry. Wood and wood-based materials properties. Safety of timber structures design, ultimate limit states, valid standards. Cross section design of simple members. Connections of timber structures. Glued joints. Basic structural systems. Fire design. Protection of timber structures.			
136SS02	Road construction 2	Z,ZK	5
Design classification of roads and motorways, design speed, road horizontal alignment and level design, form of road and motorway cross sections, road earthwork - proportions, shapes and design, volume of earthworks, muss-haul diagram, road engineering structures, equipment of roads and motorways, crossroads and intersections. Urban roads, dissimilarities of urban road traffic and construction, function classes and marking of urban road types, traffic place and street place, principles of traffic calming on urban roads.			

137ZE01	Railway Structures 1	Z,ZK	7

Vehicle and track, track construction and geometry, track spatial disposition, research and projection, project documentation, tracing and pegging out of a railway track, railway construction, sub-ballast layers, earth solid and trackbed construction, defect and stability increment of substructure, requirements for soil bearing capacity and soil consolidation, substructure drainage, railway artificial structures.

Code of the group: BK202007
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, 7. semestr
Requirement credits in the group: In this group you have to gain at least 20 credits
Requirement courses in the group: In this group you have to complete at least 5 courses
Credits in the group: 20
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
132PRPM	**Deformation and Failure of Materials** *Milan Jirásek, Petr Havlásek, Lenka Dohnalová* ***Milan Jirásek*** *Milan Jirásek (Gar.)*	Z,ZK	5	2P+2C	Z	P
133BM1K	**Concrete Bridges 1** *Michal Drahorád* ***Michal Drahorád*** *Michal Drahorád (Gar.)*	Z,ZK	6	3P+3C	Z	P
134OM1K	**Steel Bridges 1** *Pavel Ryjáček* ***Pavel Ryjáček*** *Pavel Ryjáček (Gar.)*	Z,ZK	4	3P+1C	Z	P
135PZMH	**Rock mechanics and underground structures** *Matouš Hilar, Alexandr Butovič* ***Matouš Hilar*** *Jan Pruška (Gar.)*	Z,ZK	5	3P+2C	Z	P
100ODPR	**Industrial Training (3 weeks)** *Jan Růžička, Petr Hájek, Kateřina Sojková* ***Michal Jandera*** *Michal Jandera (Gar.)*	Z	0	6C	Z,L	P

Characteristics of the courses of this group of Study Plan: Code=BK202007 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, 7. semestr

132PRPM	Deformation and Failure of Materials	Z,ZK	5

Viscoelasticity, models for concrete creep. Theory of plasticity, principles of limit and incremental analysis. Fracture mechanics. Damage mechanics.

133BM1K	Concrete Bridges 1	Z,ZK	6

The aim of the course is an introduction into principles of design of concrete ans masonry bridges. The course involves also corresponding problems from terminology, arrangement and loads on bridges up to design of various types of concrete bridge structures and technology of their construction.

134OM1K	Steel Bridges 1	Z,ZK	4

This course includes basic problems of design of steel and composite steel - concrete road and railway bridges

135PZMH	Rock mechanics and underground structures	Z,ZK	5

Geotechnical investigation, basic conceptions of rock classification and properties evaluation, laboratory and field testing, elements of calculations in rock mechanics and underground construction, tunnelling methods (NATM, drill and blast, tunnel boring machines, cut and cover structures), grouting, waterproofing

100ODPR	Industrial Training (3 weeks)	Z	0

Professional practice is an important part of academic education in undergraduate degree programmes. The student will gain a basic understanding of duties and professional responsibilities. The professional practice evaluates the sum of all knowledge acquired through previous theoretical studies and is a proof of their acquisition.

Code of the group: BK202008
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, 8. semestr
Requirement credits in the group: In this group you have to gain at least 10 credits
Requirement courses in the group: In this group you have to complete at least 2 courses
Credits in the group: 10
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
122TDOS	**Technology of Traffic Buildings** *Pavel Svoboda, Jaroslav Synek* ***Jaroslav Synek*** *Jaroslav Synek (Gar.)*	ZK	4	2P	Z	P
126STMN	**Construction Management** *Dana Měšťanová, Renáta Schneiderová Heralová, Václav Tatýrek, Jaroslava Tománková, Zita Prostějovská* ***Martin Čásenský*** *Zita Prostějovská (Gar.)*	Z,ZK	6	3P+2C	Z,L	P

Characteristics of the courses of this group of Study Plan: Code=BK202008 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, 8. semestr

122TDOS	Technology of Traffic Buildings	ZK	4

The subject deals with the issue of construction progress and mechanization of processes on engineering infrastructure construction sites. Students will become familiar with the issue of construction production preparation from the contractor's point of view, focused on the decisive processes of preparation and production management. Quality management principles. It introduces the principles of comprehensive management of preparatory and implementation processes, the organization of construction works and the use of work management principles. It illuminates the principles of construction processes and the use of construction machinery and mechanization for the realization of reinforced concrete monolithic constructions, earthworks, logistics for construction works and other necessary procedures. It deals with auxiliary constructions necessary for building construction, modern methods of controlling construction machines, digital procedures used for effective preparation and implementation.

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.

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 8
The role of the block: PV

Code of the group: BK202008_1
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, povinně volitelné
Requirement credits in the group: In this group you have to gain at least 8 credits
Requirement courses in the group: In this group you have to complete at least 4 courses
Credits in the group: 8
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
123YTVM	**Production technology of building materials** *Eva Vejmelková, Dana Koňáková, Vojtěch Pommer, Martin Böhm* ***Eva Vejmelková*** *Eva Vejmelková (Gar.)*	Z	2	1P+1C	Z	PV
132YMMO	**Modern Methods of Optimization** *Matěj Lepš, Jan Zeman* ***Matěj Lepš*** *Matěj Lepš (Gar.)*	Z	2	1P+1C	Z	PV
132YPM1	**Computer Analysis of Structures 1** *Petr Fajman* ***Petr Fajman*** *Petr Fajman (Gar.)*	Z	2	1P+1C	L	PV
132YPV1	**Programming in C++ for Engineering Calculations 1** *Tomáš Koudelka, Anna Kučerová, Stanislav Šulc* ***Tomáš Koudelka*** *Anna Kučerová (Gar.)*	Z	2	1P+1C	Z	PV
133YPRK	**Failures and Rehabilitation of Concrete Structures** *Jakub Žák, Petr Štemberk* ***Petr Štemberk*** *Petr Štemberk (Gar.)*	Z	2	1P+1C	Z	PV
133YTB	**Technology of Concrete II** *Josef Fládr* ***Josef Fládr*** *Josef Fládr (Gar.)*	Z	2	1P+1C	Z	PV
134YMOD	**Numerical Modeling of Steel and Timber Structures** *Karel Mikeš* ***Karel Mikeš*** *Karel Mikeš (Gar.)*	Z	2	1P+1C	Z	PV
134YPNK	**Fire Resistance of Steel and Timber Structures** *Zdeněk Sokol* ***Zdeněk Sokol*** *Zdeněk Sokol (Gar.)*	Z	2	1P+1C	Z	PV
135YVZK	**Computer analysis in foundation engineering** *Jan Salák, Alena Zemanová, Jan Ježek, Jan Pruška, Daniel Turanský, Jan Salášek* ***Daniel Jirásko*** *Daniel Jirásko (Gar.)*	Z	2	1P+1C	Z	PV
136YSKL	**Airports** *Petr Mondschein, Petr Pánek* ***Petr Pánek*** *Petr Mondschein (Gar.)*	Z	2	1P+1C	Z	PV
123YNTP	**Numerical Analysis of Transport Processes** *Jiří Maděra, Václav Kočí* ***Jiří Maděra*** *Jiří Maděra (Gar.)*	Z	2	1P+1C	Z	PV
126YVSF	**Small Business Management** *Jana Frková, Olga Heralová* ***Eduard Hromada*** *Eduard Hromada (Gar.)*	Z	2	1P+1C	Z,L	PV
132YNMI	**Numerical Methods in Engineering Practice** *Petr Kabele, Milan Jirásek, Jaroslav Kruis, Jan Zeman* ***Milan Jirásek*** *Milan Jirásek (Gar.)*	Z	2	1P+1C	Z	PV
132YDSK	**Diagnostics of Building Structures** *Michal Polák* ***Michal Polák*** *Michal Polák (Gar.)*	Z	2	1P+1C	L	PV
132YMCK	**Micromechanics of Cement-Based Composites** *Vít Šmilauer* ***Vít Šmilauer*** *Vít Šmilauer (Gar.)*	Z	2	1P+1C	L	PV
132YPM2	**Computer Analysis of Structures 2** *Jiří Máca, Petr Fajman* ***Jiří Máca*** *Petr Fajman (Gar.)*	Z	2	1P+1C	L	PV
132YSHK	**Statics and Reconstruction of Historical Structures** *Petr Fajman* ***Petr Fajman*** *Petr Fajman (Gar.)*	Z	2	1P+1C	L	PV
133YBKP	**Computer design of concrete structures** *Michal Drahorád* ***Michal Drahorád*** *Michal Drahorád (Gar.)*	Z	2	2C	Z,L	PV
133YBSV	**Concretes with Special Properties** *Michal Ševula* ***Michal Ševula*** *Michal Ševula (Gar.)*	Z	2	1P+1C	L	PV
133YMVB	**Concrete and Masonry Structures 1** *Tomáš Trtík, Petr Bílý, Josef Novák* ***Petr Bílý*** *Petr Bílý (Gar.)*	Z	2	1P+1C	L	PV
133YPNB	**Fire desgn og concrete and mnsory structures** *Radek Štefan, Martin Benýšek* ***Radek Štefan*** *Radek Štefan (Gar.)*	Z	2	1P+1C	L	PV
133YTBM	**Technology of Construction and Reconstructions of Bridge Structures** *Marek Foglar* ***Marek Foglar*** *Marek Foglar (Gar.)*	Z	2	1P+1C	L	PV

134YDUV	**Timber and Sustainable Construction** *Anna Kuklíková **Anna Kuklíková** Anna Kuklíková (Gar.)*	Z	2	1P+1C	L	PV
134YNKS	**Glass Structures** *Martina Eliášová **Martina Eliášová** Martina Eliášová (Gar.)*	Z	2	1P+1C	L	PV
134YOM2	**Steel Bridges 2** *Vojtěch Stančík **Vojtěch Stančík** Pavel Ryjáček (Gar.)*	Z	2	1P+1C	L	PV
134YTSK	**Thin-Walled and Composite Structures** *Michal Jandera **Michal Jandera** Michal Jandera (Gar.)*	Z	2	1P+1C	L	PV
135YING	**Engineering geology** *Svatoslav Chamra, Milan Aue **Kateřina Kovářová** Milan Aue (Gar.)*	Z	2	1P+1C	L	PV
135YVPZ	**Computer analysis in underground structures** *Jan Ježek, Matouš Hilar, Jan Pruška, Daniel Turanský **Jan Pruška** Jan Pruška (Gar.)*	Z	2	1P+1C	L	PV
136YBD1	**BIM for Transport Infrastructure and Building Structures** ***Petr Pánek***	Z	4	1P+3C		PV
136YMKO	**Urban Roads** *Michal Uhlík **Michal Uhlík** Michal Uhlík (Gar.)*	Z	2	1P+1C	L	PV
136YSSO	**Road Software** *Jakub Veselý, Jiří Černý **Jakub Veselý** Petr Pánek (Gar.)*	Z	2	1P+1C	L	PV
137YKZE	**Construction of Railway Structure** *Leoš Horníček, Petr Břešťovský **Lenka Lomoz** Leoš Horníček (Gar.)*	Z	2	1P+1C	L	PV
137YMKK	**City Rail Transport** *Hana Krejčiříková **Lenka Lomoz** Martin Lidmila (Gar.)*	Z	2	1P+1C	Z	PV
137YVTK	**High Speed Tracks** *Hana Krejčiříková **Lenka Lomoz** Hana Krejčiříková (Gar.)*	Z	2	1P+1C	L	PV

Characteristics of the courses of this group of Study Plan: Code=BK202008_1 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, povinně volitelné

123YTVM	Production technology of building materials	Z	2
Basic building materials, different types of the production technology, energy consumption of the production, storage and transport, safety at work.			
132YMMO	Modern Methods of Optimization	Z	2
The course is aimed at an overview of numerical optimization methods applicable not only in the Civil Engineering area. The emphasis is put more on the introduction of driving principles, however, practical applications in MATLAB environment are also conducted during exercises.			
132YPM1	Computer Analysis of Structures 1	Z	2
Static model of a structure. Computer codes RFEM-Dlubal, SCIA Engineer.			
132YPV1	Programming in C++ for Engineering Calculations 1	Z	2
Introduction to C++ programming, non-objective primer of the language, basic algorithms used in the engineering computing.			
133YPRK	Failures and Rehabilitation of Concrete Structures	Z	2
The course focuses on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measures. Methods of strengthening existing concrete structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of bending moment and shear, and foundation structures are discussed. The course appropriately combines theoretical approaches with common practice.			
133YTB	Technology of Concrete II	Z	2
Basic properties of the concrete components and their influence on the concrete properties are presented. Furthermore, destructive and non-destructive testing methods for concrete and reinforced concrete elements are introduced. The last chapters of the lectures are devoted to the real applications of concrete structures. The theoretical lectures are accompanied by exercises, where the students have the unique opportunity to try out the acquired knowledge in laboratory, including special tests.			
134YMOD	Numerical Modeling of Steel and Timber Structures	Z	2
Subject familiarize students with the basis of modelling od steel and timber structures. Students manage basis of simulation during the creation of static model of the structure as well as the global analysis and check with respect to European design codes.			
134YPNK	Fire Resistance of Steel and Timber Structures	Z	2
The class gives introduction to fire safety and fire resistance of steel, steel-concrete composite and timber structural elements.			
135YVZK	Computer analysis in foundation engineering	Z	2
Numerical methods in CAD/CAM in geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical software both in the field of conventional methods and in numerical modelling domain. Practical solutions of selected geotechnical problems.			
136YSKL	Airports	Z	2
History of aviation, supersonic air transport Division of aircraft, LPJ, LPH, Legislation selected terms and definitions from the field of airports Aircraft movement, take-off and landing, determination of runway length Aircraft parameters affecting airport design, Code marking, track system location and arrangement, Capacity issue of airports, flight areas, influence of air traffic on railways History of road construction Soils, road construction design based on subsoil quality Aggregate, non-bonded mixtures, assessment of the suitability of materials for use in non-bonded layers, laying technology Hydraulically cemented mixtures and aggregates Asphalt materials			
123YNTP	Numerical Analysis of Transport Processes	Z	2
Assessment of hygrothermal conditions in civil engineering problems. Basic description of porous space. Description of transport processes (heat and moisture) in porous materials. Classification of mathematical models (diffusion-, convection- and mixed type). Computational models for solution of transport problems in porous space basic description and application. Introduction to structure and composition of computer codes WUFI and HEMOT, solution of simple transport problems (heat and moisture). Initial and boundary conditions principles, significance and impact to analysis of transport problems.			
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.			
132YNMI	Numerical Methods in Engineering Practice	Z	2
The course is focused on basic numerical methods for solving large sets of algebraic equations and boundary or initial value problems. In the context of differential equations, the finite difference and finite element methods are explained from the viewpoints of an engineering scientist and a mathematician.			
132YDSK	Diagnostics of Building Structures	Z	2

132YMCK	Micromechanics of Cement-Based Composites	Z	2
Cement composites form the basis of today's civilization and construction industry; traditional concrete is now the most produced material in the world with an average consumption of over 1 m3 / person / year. The properties of these composites can be changed in a wide range according to needs - compressive strength up to 800 MPa, creep, shrinkage, resistance to environmental influences or the formation of cracks. The subject presents a multi-scale description of these cement composites, from the atomic level to the building structure level. It includes an overview of experimental methods used to identify properties, analytical and numerical methods for modeling hydration, heat transfer, elasticity, creep and strength across different levels of resolution. The subject is supplemented by a whole range of engineering applications on which these methods have been successfully used - designs and optimization of massive concrete structures (arches with cooling, foundation blocks, guide faces of dams), cement concrete highway covers with extended durability, sprayed concrete with replacement of Portland cement with calcium sulphide binders, innovative crack-resistant materials, alkali-activated fly ash. Most of the used numerical models have been implemented in the open-source software OOFEM, which you can freely use, for example, for your prediction of temperatures during hydration, stress and crack analysis including the influence of reinforcement and boundary conditions.		
132YPM2	Computer Analysis of Structures 2	Z	2
Limit state of frames. Stability analysis of structures. Second order theory. Beams and gridwork girders on elastic foundation. Plate and wall structures. Dynamic analysis of structures. Verification of results.			
132YSHK	Statics and Reconstruction of Historical Structures	Z	2
Short overview of historical vaults and roof trusses. Static behaviour and most frequent causes of failure. Methods of reconstruction, changes in foundation conditions included. Most frequent causes of failure of panel buildings. Visit to the historical part of Prague Castle.			
133YBKP	Computer design of concrete structures	Z	2
The subject is focused on practical application of computer aided design of structures in the field of concrete structures.			
133YBSV	Concretes with Special Properties	Z	2
High-strength concrete, fibre concrete, self-compacting concrete, shotcrete and fibreconcretes, lightweight concrete, heavyweight concrete; their properties and applications in practice. New findings in technology.			
133YMVB	Concrete and Masonry Structures 1	Z	2
The content of the subject will be selected problems from the following areas: Reinforcement of discontinuities of reinforced concrete structures. Introduction to nonlinear modeling of reinforced concrete structures. Preparation of input data for numerical models. Design of structures using MATLAB. Presentation of selected programs for the design of concrete structures.			
133YPNB	Fire desgn og concrete and mnsory structures	Z	2
The course is focused on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal analysis, loads, design principles, design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures.			
133YTBM	Technology of Construction and Reconstructions of Bridge Structures	Z	2
Technology of construction and reconstructions of concrete bridge structures - substructure and foundations, superstructures. Basis of design and detailing.			
134YDUV	Timber and Sustainable Construction	Z	2
Introduction to sustainable use of wood in construction with respect to previous courses. Theoretical methods of structural design and design of structures composed from different materials. Principles of strengthening and repairing of timber structures.			
134YNKS	Glass Structures	Z	2
The course is intending to introduce the students the field of structural applications of glass and to give them some specific skills for calculation and detailing of for basic glass structures: panes beams and fins, columns and walls, point-supported glass, as well as for glazing systems such as glass facades, canopies and roofs, stairs and floors. On this purpose the properties of glass as structural material will be presented in comparison with other basic building materials, together with selected examples of glass/glazing applications. Design details and connecting technology, relevant technical regulations, specification and current methods applied in design will be described. Worked examples will accompany the lectures for better understanding, and design project will help to fix specific knowledge.			
134YOM2	Steel Bridges 2	Z	2
The subject deals with the analysis, design and specifics of steel railway bridges.			
134YTSK	Thin-Walled and Composite Structures	Z	2
The course includes advanced analysis and structural design of slender sections and cold-formed sections. Advanced structural design of steel-concrete composite is also included.			
135YING	Engineering geology	Z	2
Engineering geological survey methods. Geological and engineering geological maps and profiles. Foundation soils in terms of engineering geology and hydrogeology. Aggressive waters. Rock mass - areas of discontinuities, their evaluation. Deposits of natural building materials. Landslides and slope protection. Engineering geological survey for different types of civil engineering structures. Challenges of urban geology. Engineering geology in environmental design and protection.			
135YVPZ	Computer analysis in underground structures	Z	2
Numerical methods in CAD/CAM in geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical software both in the field of conventional methods and in numerical modelling domain. Practical solutions of selected geotechnical problems.			
136YBD1	BIM for Transport Infrastructure and Building Structures	Z	4
Introduction to the issue of BIM - BIM in the LC project, BIM in the Czech Republic and in the world, Designing structures - Examples of the use of information models in engineering constructions, databases and facility management, Facility management - Modeling of load-bearing structures, design and placement of detail, level of detail, Specifics BIM in transport construction, BIM tools and technologies, Design and implementation in road structures, BIM for construction project management, legislation, BIM project management for construction production valuation.			
136YMKO	Urban Roads	Z	2
Specifics of urban roads, functions and transverse layout of urban roads, principles of at-grade intersections design, roundabouts, organization, traffic regulation and management, traffic calming, safety audit and inspection, traffic survey and documentation of selected elements of urban roads.			
136YSSO	Road Software	Z	2
Types of road design programs, Civil 3D development program, basic concepts. Sample creation of DTM, direction guide, height guide, template, corridor, cross sections. Civil 3D directional and elevation solutions, cross-section templates, corridor. Civil 3D traces of cross sections, cross sections. Cubature, mass, cogobody - geodetic coordination drawing. CivilTools. AUTOTurn towing curves. Vehicle Tracking towing curves. ASPE ESTICON- budget. PROCONOM CDE. Roadpac - directional and height solution example. ASPE ESTICON.			
137YKZE	Construction of Railway Structure	Z	2
The subject is focused on solving basic tasks in the design of railway structures in practice. The content of the subject follows on from the content of the basic subjects of construction of railway structures. In particular, it expands knowledge in the field of designing the geometrical parameters of the track taking into account vehicles using higher values of the lack of cant, calculating the spatial permeability of the track, designing new platform edges, drainage of the track and others.			
137YMKK	City Rail Transport	Z	2
Solution of the city urban transport especially principles of project and construction of tramway and underground track for complex city urban solution. Solution of integrate city transport, characteristics of single systems and transfer nodes, characteristic of suburban traffic and the principle solution.			
137YVTK	High Speed Tracks	Z	2
The concept of building the European high-speed rail network, the geometric position of the track and the construction of the railway top and bottom, examples of solutions for high-speed rail transport abroad and the construction concept at the Railway Administration			

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: 1
The role of the block: S

Code of the group: BK202006_1
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, 6. semestr, výuka v terénu
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
136YSVT	**Field Work - Road Construction** *Petr Mondschein, Petr Pánek* ***Petr Pánek*** *Petr Mondschein (Gar.)*	KZ	1	2C	L	S
137YZVT	**Field training - Railway structures (1 week)** *Ondřej Bret, Michal Petýrek* ***Lenka Lomoz*** *Leoš Horníček (Gar.)*	KZ	1	2C	L	S

Characteristics of the courses of this group of Study Plan: Code=BK202006_1 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, 6. semestr, výuka v terénu

136YSVT	Field Work - Road Construction	KZ	1
Planimetric and hypsometric sight existing communication (polygonal traverse, sight cross section), design reconstruction, graphical part (situation, longitudinal profile, typical cross-section).Choice traffic- engineering inquiry.			
137YZVT	Field training - Railway structures (1 week)	KZ	1
The subject is focused on the practical acquisition of skills in the field of passporting of the railway line, basic geodetic work (polygon plan, alignment of cross-sections and longitudinal profile, laying out the transition curve) and the processing of related calculation and drawing documentation. Part of the teaching is the performance of a static and impact load test and the measurement of the parameters of the structural arrangement of the track in the curve and in the turnout. The education takes place in the form of a five-day course on a real railway track. Students work in teams.			

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** *Hana Horká, Petra Martincová, Petra Florianová, Sandra Giormani, Svatava Boboková Bartíková, Věra Čermáková, Karolína Synková, Alexandra Steinerová, Elena Dačeva, ...* ***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** *Hana Horká, Petra Martincová, Petra Florianová, Sandra Giormani, Svatava Boboková Bartíková, Věra Čermáková, Karolína Synková, Alexandra Steinerová, Elena Dačeva, ...* ***Svatava Boboková Bartíková*** *Sandra Giormani (Gar.)*	Z,ZK	2	2C		J
104YC2N	**German 2** *Svatava Boboková Bartíková* ***Sandra Giormani*** *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: 17
The role of the block: S1

Code of the group: BK20200700_1
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, projekty K, 7. semestr
Requirement credits in the group: In this group you have to gain 5 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 5
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
132YKPJ	**Project Design K** *Michal Polák, Matěj Lepš, Tomáš Koudelka, Tomáš Plachý, Pavel Tesárek, Aleš Jíra, Petr Kabele, Michal Šejnoha, Milan Jirásek, ...* ***Aleš Jíra*** *Jan Pruška (Gar.)*	KZ	5	4C	Z	S1
133YKPJ	**Project Design K** ***Lukáš Vráblík*** *Lukáš Vráblík (Gar.)*	KZ	5	4C	Z	S1
134YKPJ	**Project Design K** ***Jakub Dolejš***	KZ	5	4C	Z	S1

Characteristics of the courses of this group of Study Plan: Code=BK20200700_1 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, projekty K, 7. semestr

132YKPJ	Project Design K	KZ	5
Students develop individual projects under supervision of teachers from the Department of Mechanics. Project topics are presented at the department website. Students may propose own topics - in this case, suitability of the topic and feasibility of the project will be evaluated by the project supervisor.			
133YKPJ	Project Design K	KZ	5
The content of the subject is the basic conceptual design of an engineering structure (bridge, underground structure, chimney, cooling tower, atypical building structure). The effort is to focus the student's work on the conceptual design of the loadbearing structure, variant solutions, including their preliminary analysis and subsequent selection of the final variant. The output of the design project is also a brief research study of literature dealing with the given studied issue. The tuition is in the form of consultations with the leading teacher.			
134YKPJ	Project Design K	KZ	5
Design of a steel or timber structure by a team of three students. In the first phase each student prepares alternative solution, followed by a choice of the optimum design by the all team. In the second phase the team deals jointly with: final layout, static calculation, drawing documentation of selected details and technical report. In the end the team prepares powerpoint presentation of the all progress of work.			

Code of the group: BK202008_2
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, 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
101BAPK	**Bachelor Thesis** *Jozef Bobok* ***Jozef Bobok*** *Jozef Bobok (Gar.)*	Z	12	10C	L,Z	S1
132BAPK	**Bachelor Thesis** *Michal Polák, Matěj Lepš, Aleš Jíra, Michal Šejnoha, Milan Jirásek, Jan Vorel, Martin Doškář, Martin Horák, Petr Havlásek, ...* ***Jan Pruška*** *Jan Pruška (Gar.)*	Z	12	10C	L,Z	S1
133BAPK	**Bachelor Thesis** ***Lukáš Vráblík***	Z	12	10C	L,Z	S1
134BAPK	**Bachelor Thesis** *Jakub Dolejš* ***Jakub Dolejš*** *Jakub Dolejš (Gar.)*	Z	12	10C	L,Z	S1
135BAPK	**Bachelor Thesis** ***Jan Pruška***	Z	12	10C	L,Z	S1
136BAPK	**Bachelor Thesis** ***Michal Uhlík*** *Ludvík Vébr (Gar.)*	Z	12	10C	L,Z	S1
137BAPK	**Bachelor Thesis** *Ondřej Bret, Vít Lojda, Michal Petýrek* ***Lenka Lomoz*** *Leoš Horníček (Gar.)*	Z	12	10C	L,Z	S1
210BAPK	**Bachelor Thesis** *Jan Zatloukal, Jiří Litoš, Jindřich Fornůsek, Pavel Reiterman, Radoslav Sovják* ***Jiří Litoš*** *Jiří Litoš (Gar.)*	Z	12	10C	L,Z	S1
220BAPK	**Bachelor Thesis** *Jiří Svoboda, Radek Vašíček* ***Radek Vašíček*** *Radek Vašíček (Gar.)*	Z	12	10C	L,Z	S1

Characteristics of the courses of this group of Study Plan: Code=BK202008_2 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, bakalářská práce

101BAPK	Bachelor Thesis	Z	12
Please contact your teacher or guarantor of this subject.			
132BAPK	Bachelor Thesis	Z	12
The assignment of the final thesis is always individual based on the agreement of the teacher and the student. The vast majority of assignments are connected with the scientific and research activities of the respective employee. The output of the solution may be a brief research study of the given problem, experimental activity, programming and others according to the respective assignment.			
133BAPK	Bachelor Thesis	Z	12
A bachelor thesis is the qualification thesis of a bachelor's degree. The assignment can be a structural design of bridge or engineering structure with a focus on chosen details, technology etc. or a research study of partial issue with a variant comparative analysis or a parametric study or performing and analysing experiments, etc.			
134BAPK	Bachelor Thesis	Z	12
In this course, student formulates a bachelor's thesis that is necessary to reach the bachelor's degree. This course is focused on steel or timber structural design.			

135BAPK	Bachelor Thesis	Z	12
The bachelor thesis concludes the bachelor studies. The student demonstrates that he/she can apply the knowledge acquired during the study on a specific project. The bachelor thesis is related to selected subjects of the study plan. For students of K.			
136BAPK	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.			
137BAPK	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: work with professional literature, processing of professional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railway line, study of new lines), research (processing an overview of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified laboratory tests).			
210BAPK	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.			
220BAPK	Bachelor Thesis	Z	12
Bachelor thesis elaboration with possible use of geotechnical laboratory and underground facility Josef.			

Name of the block: Povinně volitelné předměty, doporučení S2
Minimal number of credits of the block: 5
The role of the block: S2

Code of the group: BK20200700_2
Name of the group: Stavební inženýrství, specializace Konstrukce a dopravní stavby, projekty D, 7. semestr
Requirement credits in the group: In this group you have to gain 5 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 5
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
135YDPJ	**Project Design D** *Jan Salák, Alena Zemanová, Jiří Barták, Jan Kos, Jan Pruška* ***Jan Pruška*** *Jan Pruška (Gar.)*	KZ	5	4C	Z	S2
136YDPJ	**Project Design D** *Jaromíra Ježková, Petr Mondschein* ***Petr Mondschein*** *Petr Mondschein (Gar.)*	KZ	5	4C	Z	S2
137YDPJ	**Project Design D** *Michal Petýrek, Jiří Pospíšil, Leoš Horníček* ***Lenka Lomoz*** *Leoš Horníček (Gar.)*	KZ	5	4C	Z	S2
220YDPJ	**Project Design D** *Markéta Kučerová, Jiří Svoboda, Radek Vašíček* ***Radek Vašíček*** *Radek Vašíček (Gar.)*	KZ	5	4C	Z	S2

Characteristics of the courses of this group of Study Plan: Code=BK20200700_2 Name=Stavební inženýrství, specializace Konstrukce a dopravní stavby, projekty D, 7. semestr

135YDPJ	Project Design D	KZ	5
The project assignment is always individual based on the agreement of the teacher and the student. The vast majority of assignments are linked to the professional focus of the respective employee. The output of the solution may be a brief research study of the given problem, experimental work, solution of a selected geotechnical problem, programming and others according to the respective assignment.			
136YDPJ	Project Design D	KZ	5
The design of three-leg grade intersection based on the capacity assessment, the evaluation of the additional lanes requirement of the grade intersection and its designing. Technological tasks in the field of soils, asphalt mixtures and quality control.			
137YDPJ	Project Design D	KZ	5
The project includes variants of the route, a detailed final variant, longitudinal section, cross sections and a technical report including the design of the sleeper bed. The project also includes an economic assessment of the proposed variant.			
220YDPJ	Project Design D	KZ	5
Solution of practical topic from the field of experimental geotechnics - familiarization with testing procedures in the laboratory and in the field (Underground Laboratory Josef - http://ceg.fsv.cvut.cz). Literature review, preparation and execution of tests, evaluation. Topics are linked to CEG research projects. Suitable as a preparation for bachelor thesis. The solution takes place after an individual agreement with the supervisor of particular topic.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
100ODPR	Industrial Training (3 weeks)	Z	0
	Professional practice is an important part of academic education in undergraduate degree programmes. The student will gain a basic understanding of duties and professional responsibilities. The professional practice evaluates the sum of all knowledge acquired through previous theoretical studies and is a proof of their acquisition.		
101BAPK	Bachelor Thesis	Z	12
	Please contact your teacher or guarantor of this subject.		
101KG01	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.		
101MA01	Mathematics 1	Z,ZK	6
	https://mat.fsv.cvut.cz/bubenik/mat1detail.htm		
101MA02	Mathematics 2	Z,ZK	6
	https://mat.fsv.cvut.cz/vyuka/bakalari/eng/ls/MT02/		
101MA03	Mathematics 3	Z,ZK	6
	https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/		
102FYI	Physics	Z,ZK	4
	This is a basic physics course for students of the study programmes Civil Engineering; Management and Economics in Construction. The course focuses on mechanics and basic thermodynamics. The following areas are covered in the course: Mechanics of material points (particles) and deformable bodies. Discrete and continuous model of matter. Kinematics and dynamics of a material point (particle). Mechanical force fields. Gravitational field. Mechanical vibrations. Material deformation. Elastic waves. Acoustics. Hydromechanics. Fundamentals of thermodynamics. Heat transfer.		
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		
105SVAI	Social Sciences and Architecture	Z,ZK	5
	The subject combines the teaching of several social sciences: economics and economic policies, political science, political philosophy and law, with an overview of the development of architecture. In the section devoted to economics, the basic categories of the market economy, the foundations of economic policy and the basic concepts of international economics are explained. Theoretical interpretation is effectively combined with practical examples from economic reality. In the lectures devoted to law, a brief overview of the development of Roman law and its institutions is supplemented by a well-founded interpretation of the constitution, human rights and the labor code. Great attention is paid to selected provisions of the Civil Code and the Construction Act. In the political science lectures, the political development in ancient times is described in an engaging way, the theory of the state, political systems, democracy and totalitarianism are clarified. The series of lectures on the history of architecture and construction provides a comprehensive interpretation of the history of architecture from antiquity to postmodernism and deconstruction.		
122TDOS	Technology of Traffic Buildings	ZK	4
	The subject deals with the issue of construction progress and mechanization of processes on engineering infrastructure construction sites. Students will become familiar with the issue of construction production preparation from the contractor's point of view, focused on the decisive processes of preparation and production management. Quality management principles. It introduces the principles of comprehensive management of preparatory and implementation processes, the organization of construction works and the use of work management principles. It illuminates the principles of construction processes and the use of construction machinery and mechanization for the realization of reinforced concrete monolithic constructions, earthworks, logistics for construction works and other necessary procedures. It deals with auxiliary constructions necessary for building construction, modern methods of controlling construction machines, digital procedures used for effective preparation and implementation.		
123CHE	Chemistry	Z,ZK	4
	Introduction to general chemistry - chemical bond, compounds, reactions, equilibrium. Chemistry of environment - water, atmosphere, pedosphere. Chemistry of building materials - inorganic binders, glass, ceramic, metals, natural polymers, wood, synthetic polymers on C and Si basis. Introduction to degradation of building materials and to analytical chemistry.		
123SH01	Building Materials	Z,ZK	5
	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.		
123YNTP	Numerical Analysis of Transport Processes	Z	2
	Assessment of hygrothermal conditions in civil engineering problems. Basic description of porous space. Description of transport processes (heat and moisture) in porous materials. Classification of mathematical models (diffusion-, convection- and mixed type). Computational models for solution of transport problems in porous space basic description and application.		

	Introduction to structure and composition of computer codes WUFI and HEMOT, solution of simple transport problems (heat and moisture). Initial and boundary conditions principles, significance and impact to analysis of transport problems.		
123YTVM	Production technology of building materials	Z	2
	Basic building materials, different types of the production technology, energy consumption of the production, storage and transport, safety at work.		
124PSI1	Building Structures 1I	Z	4
	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.		
124PSI2	Building Structures 2I	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.		
126BIM1	BIM	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.		
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.		
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.		
132ANKC	Analysis of Structures	Z,ZK	5
	Analyses of statically determinate and statically/deformable indeterminate structures, concerning live loads solution, stresses in thin-wall beams, analysis of walls and plates, matrix formulation of deformation method, principles of FEM, models for a beam on elastic foundation and stability of structures.		
132BAPK	Bachelor Thesis	Z	12
	The assignment of the final thesis is always individual based on the agreement of the teacher and the student. The vast majority of assignments are connected with the scientific and research activities of the respective employee. The output of the solution may be a brief research study of the given problem, experimental activity, programming and others according to the respective assignment.		
132DY01	Dynamics of structures 1	Z,ZK	5
	Principles of theory of vibration, dynamic loading. Free and forced vibration of single-degree-of-freedom systems. Damped vibration. Methods of dynamic analysis of muti-degreee-of-freeedom systems.		
132PRPE	Strength of Materials	Z,ZK	6
	Fundamentals of the theory of elasticity: stress and strain of straight beams subjected to bending and free torsion, ultimate plastic capacity of a member in bending, critical loads and buckling lengths of straight compression members. Basic assumptions, quantities, and equations describing the stress and strain state in 3D continuum, plates and walls.		
132PRPM	Deformation and Failure of Materials	Z,ZK	5
	Viscoelasticity, models for concrete creep. Theory of plasticity, principles of limit and incremental analysis. Fracture mechanics. Damage mechanics.		
132SM01	Structural Mechanics 1	Z,ZK	6
	Concurrent forces, force systems acting on rigid bodies in space/plane, moment of a force about a point and line. Supports of a rigid body, reaction forces. Compound two-dimensional structures. Trusses. Reaction forces applying the principle of virtual work.		
132SM02	Structural Mechanics 2	Z,ZK	6
	Internal forces diagrams of simple statically determinate plane structures and compound two-dimensional structures. Multiaxially loaded cantilever. Definition of normal stress and prepositions of its distribution in a cross section. Equivalence of internal forces. Geometry of mass and areas, centre of gravity and moments of inertia.		
132SM3	Structural Mechanics 3	Z,ZK	5
	Deformation and force method for the solution of reactions and internal forces on statically indeterminate beams, frames, and truss structures. Calculation of displacements of beams, frames, and truss structures using the principle of virtual works.		
132YDSK	Diagnostics of Building Structures	Z	2
132YKPJ	Project Design K	KZ	5
	Students develop individual projects under supervision of teachers from the Department of Mechanics. Project topics are presented at the department website. Students may propose own topics - in this case, suitability of the topic and feasibility of the project will be evaluated by the project supervisor.		
132YMCK	Micromechanics of Cement-Based Composites	Z	2
	Cement composites form the basis of today's civilization and construction industry; traditional concrete is now the most produced material in the world with an average consumption of over 1 m3 / person / year. The properties of these composites can be changed in a wide range according to needs - compressive strength up to 800 MPa, creep, shrinkage, resistance to environmental influences or the formation of cracks. The subject presents a multi-scale description of these cement composites, from the atomic level to the building structure level. It includes an overview of experimental methods used to identify properties, analytical and numerical methods for modeling hydration, heat transfer, elasticity, creep and strength across different levels of resolution. The subject is supplemented by a whole range of engineering applications on which these methods have been successfully used - designs and optimization of massive concrete structures (arches with cooling, foundation blocks, guide faces of dams), cement concrete highway covers with extended durability, sprayed concrete with replacement		

	of Portland cement with calcium sulphide binders, innovative crack-resistant materials, alkali-activated fly ash. Most of the used numerical models have been implemented in the open-source software OOFEM, which you can freely use, for example, for your prediction of temperatures during hydration, stress and crack analysis including the influence of reinforcement and boundary conditions.		
132YMMO	Modern Methods of Optimization	Z	2
	The course is aimed at an overview of numerical optimization methods applicable not only in the Civil Engineering area. The emphasis is put more on the introduction of driving principles, however, practical applications in MATLAB environment are also conducted during exercises.		
132YNMI	Numerical Methods in Engineering Practice	Z	2
	The course is focused on basic numerical methods for solving large sets of algebraic equations and boundary or initial value problems. In the context of differential equations, the finite difference and finite element methods are explained from the viewpoints of an engineering scientist and a mathematician.		
132YPM1	Computer Analysis of Structures 1	Z	2
	Static model of a structure. Computer codes RFEM-Dlubal, SCIA Engineer.		
132YPM2	Computer Analysis of Structures 2	Z	2
	Limit state of frames. Stability analysis of structures. Second order theory. Beams and gridwork girders on elastic foundation. Plate and wall structures. Dynamic analysis of structures. Verification of results.		
132YPV1	Programming in C++ for Engineering Calculations 1	Z	2
	Introduction to C++ programming, non-objective primer of the language, basic algorithms used in the engineering computing.		
132YSHK	Statics and Reconstruction of Historical Structures	Z	2
	Short overview of historical vaults and roof trusses. Static behaviour and most frequent causes of failure. Methods of reconstruction, changes in foundation conditions included. Most frequent causes of failure of panel buildings. Visit to the historical part of Prague Castle.		
133BAPK	Bachelor Thesis	Z	12
	A bachelor thesis is the qualification thesis of a bachelor's degree. The assignment can be a structural design of bridge or engineering structure with a focus on chosen details, technology etc. or a research study of partial issue with a variant comparative analysis or a parametric study or performing and analysing experiments, etc.		
133BK01	Concrete and Masonry Structures 1	Z,ZK	6
	The subject is focused on the design of concrete elements and constructions of multi-storey buildings - it follows on from the subject Fundamentals of Structural Design. The content of the course is the addition and generalization of procedures for verifying the load-bearing capacity of reinforced concrete structural elements for cases of bending, shear, a combination of biaxial bending and normal force, designing elements stressed by torsion, punching shear, assessment of slender compressed elements. Design procedures are discussed for individual types of structures, including the choice of suitable calculation models and calculation methods and reinforcement principles.		
133BK02	Concrete and Masonry Structures 2	Z,ZK	7
	This course builds on the courses NNK and BK01 and widens the knowledge to the necessary minimum for the bachalor studium branches C and K. 1.-3.Masonry structures - subjected to compression, bending, shear, reinforced masonry, strenghtening of masonry structures 4.- 6. Design of concrete structures to serviceability limit states: stress limitation, crack development and crack width limitation, deflections, application on waterproof structures 7.-8.Introduction to pre-stressed concrete: design of pre-stressing, losses of pre-stressing, technology 9.-12. Pre-cast concrete structures 13. Bridges: nomenclature in bridges, cross-section arrangement, loading, construction methods, Introduction to engineering structures		
133BM1K	Concrete Bridges 1	Z,ZK	6
	The aim of the course is an introduction into principles of design of concrete ans masonry bridges. The course involves also corresponding problems from terminology, arrangement and loads on bridges up to design of various types of concrete bridge structures and technology of their construction.		
133NNKB	Fundamentals of Structural Design - Concrete	Z,ZK	4
	The content of the subject are the basics of load-bearing concrete structures design 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 Civil Engineering program (Structural Mechanics, Elasticity and Strength, Building Materials, Building Structures).		
133YBKP	Computer design of concrete structures	Z	2
	The subject is focused on practical application of computer aided design of structures in the field of concrete structures.		
133YBSV	Concretes with Special Properties	Z	2
	High-strength concrete, fibre concrete, self-compacting concrete, shotcrete and fibreconcretes, lightweight concrete, heavyweight concrete; their properties and applications in practice. New findings in technology.		
133YKPJ	Project Design K	KZ	5
	The content of the subject is the basic conceptual design of an engineering structure (bridge, underground structure, chimney, cooling tower, atypical building structure). The effort is to focus the student's work on the conceptual design of the loadbearing structure, variant solutions, including their preliminary analysis and subsequent selection of the final variant. The output of the design project is also a brief research study of literature dealing with the given studied issue. The tuition is in the form of consultations with the leading teacher.		
133YMVB	Concrete and Masonry Structures 1	Z	2
	The content of the subject will be selected problems from the following areas: Reinforcement of discontinuities of reinforced concrete structures. Introduction to nonlinear modeling of reinforced concrete structures. Preparation of input data for numerical models. Design of structures using MATLAB. Presentation of selected programs for the design of concrete structures.		
133YPNB	Fire desgn og concrete and mnsory structures	Z	2
	The course is focused on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal analysis, loads, design principles, design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures.		
133YPRK	Failures and Rehabilitation of Concrete Structures	Z	2
	The course focuses on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measures. Methods of strengthening existing concrete structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of bending moment and shear, and foundation structures are discussed. The course appropriately combines theoretical approaches with common practice.		
133YTB	Technology of Concrete II	Z	2
	Basic properties of the concrete components and their influence on the concrete properties are presented. Furthermore, destructive and non-destructive testing methods for concrete and reinforced concrete elements are introduced. The last chapters of the lectures are devoted to the real applications of concrete structures. The theoretical lectures are accompanied by exercises, where the students have the unique opportunity to try out the acquired knowledge in laboratory, including special tests.		
133YTBM	Technology of Construction and Reconstructions of Bridge Structures	Z	2
	Technology of construction and reconstructions of concrete bridge structures - substructure and foundations, superstructures. Basis of design and detailing.		
134BAPK	Bachelor Thesis	Z	12
	In this course, student formulates a bachelor's thesis that is necessary to reach the bachelor's degree. This course is focused on steel or timber structural design.		
134DK01	Timber Structures 1	Z,ZK	5
	Introduction and presentation of timber structures use in building industry. Wood and wood-based materials properties. Safety of timber structures design, ultimate limit states, valid standards. Cross section design of simple members. Connections of timber structures. Glued joints. Basic structural systems. Fire design. Protection of timber structures.		

134NNKO	Design of Supporting StructuresI - 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, design differences due to the specific properties of individual materials.			
134OK01	Steel Structures 1	Z,ZK	6
The course OK01 aims to expand the knowledge acquired in the subject NNK and concerning design of basic steel structures. In the theoretical part are delivered possibilities of global analysis of structures including classification from view of necessities of nonlinear analyses. Design of steel elements is widen for global analysis methods, advanced composite steel and concrete beams/columns and cold-formed thin-walled elements. The main part of the subject deals with complex design of multi-storey steel buildings and steel industrial halls. Final lectures concern large-span structures, uniqueness in design of tall buildings, including effects of seismicity.			
134OM1K	Steel Bridges 1	Z,ZK	4
This course includes basic problems of design of steel and composite steel - concrete road and railway bridges			
134YDUV	Timber and Sustainable Construction	Z	2
Introduction to sustainable use of wood in construction with respect to previous courses. Theoretical methods of structural design and design of structures composed from different materials. Principles of strengthening and repairing of timber structures.			
134YKPJ	Project Design K	KZ	5
Design of a steel or timber structure by a team of three students. In the first phase each student prepares alternative solution, followed by a choice of the optimum design by the all team. In the second phase the team deals jointly with: final layout, static calculation, drawing documentation of selected details and technical report. In the end the team prepares powerpoint presentation of the all progress of work.			
134YMOD	Numerical Modeling of Steel and Timber Structures	Z	2
Subject familiarize students with the basis of modelling od steel and timber structures. Students manage basis of simulation during the creation of static model of the structure as well as the global analysis and check with respect to European design codes.			
134YNKS	Glass Structures	Z	2
The course is intending to introduce the students the field of structural applications of glass and to give them some specific skills for calculation and detailing of for basic glass structures: panes beams and fins, columns and walls, point-supported glass, as well as for glazing systems such as glass facades, canopies and roofs, stairs and floors. On this purpose the properties of glass as structural material will be presented in comparison with other basic building materials, together with selected examples of glass/glazing applications. Design details and connecting technology, relevant technical regulations, specification and current methods applied in design will be described. Worked examples will accompany the lectures for better understanding, and design project will help to fix specific knowledge.			
134YOM2	Steel Bridges 2	Z	2
The subject deals with the analysis, design and specifics of steel railway bridges.			
134YPNK	Fire Resistance of Steel and Timber Structures	Z	2
The class gives introduction to fire safety and fire resistance of steel, steel-concrete composite and timber structural elements.			
134YTSK	Thin-Walled and Composite Structures	Z	2
The course includes advanced analysis and structural design of slender sections and cold-formed sections. Advanced structural design of steel-concrete composite is also included.			
135BAPK	Bachelor Thesis	Z	12
The bachelor thesis concludes the bachelor studies. The student demonstrates that he/she can apply the knowledge acquired during the study on a specific project. The bachelor thesis is related to selected subjects of the study plan. For students of K.			
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.			
135GM2I	Geomechanics 2I	Z,ZK	5
Formation of soils, basic properties of soils, water in soil, strength and deformation properties of soils and their determination, improvement of soil properties, application tasks			
135PZMH	Rock mechanics and underground structures	Z,ZK	5
Geotechnical investigation, basic conceptions of rock classification and properties evaluation, laboratory and field testing, elements of calculations in rock mechanics and underground construction, tunnelling methods (NATM, drill and blast, tunnel boring machines, cut and cover structures), grouting, waterproofing			
135YDPJ	Project Design D	KZ	5
The project assignment is always individual based on the agreement of the teacher and the student. The vast majority of assignments are linked to the professional focus of the respective employee. The output of the solution may be a brief research study of the given problem, experimental work, solution of a selected geotechnical problem, programming and others according to the respective assignment.			
135YING	Engineering geology	Z	2
Engineering geological survey methods. Geological and engineering geological maps and profiles. Foundation soils in terms of engineering geology and hydrogeology. Aggressive waters. Rock mass - areas of discontinuities, their evaluation. Deposits of natural building materials. Landslides and slope protection. Engineering geological survey for different types of civil engineering structures. Challenges of urban geology. Engineering geology in environmental design and protection.			
135YVPZ	Computer analysis in underground structures	Z	2
Numerical methods in CAD/CAM in geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical software both in the field of conventional methods and in numerical modelling domain. Practical solutions of selected geotechnical problems.			
135YVZK	Computer analysis in foundation engineering	Z	2
Numerical methods in CAD/CAM in geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical software both in the field of conventional methods and in numerical modelling domain. Practical solutions of selected geotechnical problems.			
135ZS01	Foundations 1	Z,ZK	7
Introduction to the subject, literature, design principles, geotechnical categories Strength and deformation characteristics of foundation soils, slab foundations Limit states of flat foundations, calculation of bearing capacity and settlement of flat foundations Deep foundations - typology, pile foundations, drilled and driven pile technology Axial capacity of isolated piles, pile load tests Determination of bearing capacity of transversely loaded piles, pile group Micropiles, anchors, technology Conventional and jet grouting, underground walls Construction pits, technology of shoring of construction pits Principles for the design and assessment of shoring structures, earth pressure, water effect Calculation of shoring structures, pressure dependent methods Dewatering of construction pits Protection of foundation structures against the effects of aggressive environments			
136BAPK	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.		
136SS01	Road Structures 1	Z,ZK	6
	Law about roads, protection zones, components and accessories, use, drivability and passability. Introduction to traffic engineering, movement of an individual vehicle - basic dynamic characteristics. Traffic flow and its characteristics, traffic intensity and its monitoring, communication capacity and traffic quality. Capacity of intersections, level of service, theory of time gaps, negative effects of traffic. Routing principles, area of interest, directional solution, directional curves - division, application, layout scheme. Height solution. Longitudinal, transverse and resultant slope. Tilting of the roadway - types, requirements, ascents and descents, tilting of the earth plain. Road objects. Technical and technical-economic assessment, multi-criteria assessment, earthwork, distribution of materials and materials. Roadway - design of rigid and non-rigid roadway construction, computational assessment and optimization of non-rigid roadway. Urban roads - differences between urban roads and roads, space requirements - pedestrians, cyclists, disabled people - barrier-free adaptations. Traffic surveys - breakdown, types, progress, prospective intensities, recalculation of intensities, special surveys. turntables, switches. Parking, traffic areas, contour curves, traffic area solutions including drainage. Traffic calming at urban roads - principle, methods, examples.		
136SS02	Road construction 2	Z,ZK	5
	Design classification of roads and motorways, design speed, road horizontal alignment and level design, form of road and motorway cross sections, road earthwork - proportions, shapes and design, volume of earthworks, muss-haul diagram, road engineering structures, equipment of roads and motorways, crossroads and intersections. Urban roads, dissimilarities of urban road traffic and construction, function classes and marking of urban road types, traffic place and street place, principles of traffic calming on urban roads.		
136YBD1	BIM for Transport Infrastructure and Building Structures	Z	4
	Introduction to the issue of BIM - BIM in the LC project, BIM in the Czech Republic and in the world, Designing structures - Examples of the use of information models in engineering constructions, databases and facility management, Facility management - Modeling of load-bearing structures, design and placement of detail, level of detail, Specifics BIM in transport construction, BIM tools and technologies, Design and implementation in road structures, BIM for construction project management, legislation, BIM project management for construction production valuation.		
136YDPJ	Project Design D	KZ	5
	The design of three-leg grade intersection based on the capacity assessment, the evaluation of the additional lanes requirement of the grade intersection and its designing. Technological tasks in the field of soils, asphalt mixtures and quality control.		
136YMKO	Urban Roads	Z	2
	Specifics of urban roads, functions and transverse layout of urban roads, principles of at-grade intersections design, roundabouts, organization, traffic regulation and management, traffic calming, safety audit and inspection, traffic survey and documentation of selected elements of urban roads.		
136YSKL	Airports	Z	2
	History of aviation, supersonic air transport Division of aircraft, LPJ, LPH, Legislation selected terms and definitions from the field of airports Aircraft movement, take-off and landing, determination of runway length Aircraft parameters affecting airport design, Code marking, track system location and arrangement, Capacity issue of airports, flight areas, influence of air traffic on railways History of road construction Soils, road construction design based on subsoil quality Aggregate, non-bonded mixtures, assessment of the suitability of materials for use in non-bonded layers, laying technology Hydraulically cemented mixtures and aggregates Asphalt materials		
136YSSO	Road Software	Z	2
	Types of road design programs, Civil 3D development program, basic concepts. Sample creation of DTM, direction guide, height guide, template, corridor, cross sections. Civil 3D directional and elevation solutions, cross-section templates, corridor. Civil 3D traces of cross sections, cross sections. Cubature, mass, cogobody - geodetic coordination drawing. CivilTools. AUTOTurn towing curves. Vehicle Tracking towing curves. ASPE ESTICON- budget. PROCONOM CDE. Roadpac - directional and height solution example. ASPE ESTICON.		
136YSVT	Field Work - Road Construction	KZ	1
	Planimetric and hypsometric sight existing communication (polygonal traverse, sight cross section), design reconstruction, graphical part (situation, longitudinal profile, typical cross-section).Choice traffic- engineering inquiry.		
137BAPK	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: work with professional literature, processing of professional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railway line, study of new lines), research (processing an overview of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified laboratory tests).		
137YDPJ	Project Design D	KZ	5
	The project includes variants of the route, a detailed final variant, longitudinal section, cross sections and a technical report including the design of the sleeper bed. The project also includes an economic assessment of the proposed variant.		
137YKZE	Construction of Railway Structure	Z	2
	The subject is focused on solving basic tasks in the design of railway structures in practice. The content of the subject follows on from the content of the basic subjects of construction of railway structures. In particular, it expands knowledge in the field of designing the geometrical parameters of the track taking into account vehicles using higher values of the lack of cant, calculating the spatial permeability of the track, designing new platform edges, drainage of the track and others.		
137YMKK	City Rail Transport	Z	2
	Solution of the city urban transport especially principles of project and construction of tramway and underground track for complex city urban solution. Solution of integrate city transport, characteristics of single systems and transfer nodes, characteristic of suburban traffic and the principle solution.		
137YVTK	High Speed Tracks	Z	2
	The concept of building the European high-speed rail network, the geometric position of the track and the construction of the railway top and bottom, examples of solutions for high-speed rail transport abroad and the construction concept at the Railway Administration		
137YZVT	Field training - Railway structures (1 week)	KZ	1
	The subject is focused on the practical acquisition of skills in the field of passporting of the railway line, basic geodetic work (polygon plan, alignment of cross-sections and longitudinal profile, laying out the transition curve) and the processing of related calculation and drawing documentation. Part of the teaching is the performance of a static and impact load test and the measurement of the parameters of the structural arrangement of the track in the curve and in the turnout. The education takes place in the form of a five-day course on a real railway track. Students work in teams.		

137ZE01	Railway Structures 1	Z,ZK	7
Vehicle and track, track construction and geometry, track spatial disposition, research and projection, project documentation, tracing and pegging out of a railway track, railway construction, sub-ballast layers, earth solid and trackbed construction, defect and stability increment of substructure, requirements for soil bearing capacity and soil consolidation, substructure drainage, railway artificial structures.			
141HYA	Hydraulics	Z,ZK	5
A course deals with issues of hydrostatics and hydrodynamics with aiming at civil engineering applications. There are analysed tasks related to hydrostatic and hydrodynamic loading of structures, pipeline flow, open channel flow and groundwater flow.			
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.			
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			
210BAPK	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.			
220BAPK	Bachelor Thesis	Z	12
Bachelor thesis elaboration with possible use of geotechnical laboratory and underground facility Josef.			
220YDPJ	Project Design D	KZ	5
Solution of practical topic from the field of experimental geotechnics - familiarization with testing procedures in the laboratory and in the field (Underground Laboratory Josef - http://ceg.fsv.cvut.cz). Literature review, preparation and execution of tests, evaluation. Topics are linked to CEG research projects. Suitable as a preparation for bachelor thesis. The solution takes place after an individual agreement with the supervisor of particular topic.			
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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