Study plan

Name of study plan: Stavební inženýrství, specializace Pozemní 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 do 2023/24

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 Čásenský, 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: 94
The role of the block: P

Code of the group: BC202005
Name of the group: Stavební inženýrství, specializace Pozemní 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**
124SF01	**Building Physics** *Jaroslav Vychytil, Jiří Nováček **Jiří Nováček** Zbyněk Svoboda (Gar.)*	Z,ZK	6	3P+2C	Z	P
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

Characteristics of the courses of this group of Study Plan: Code=BC202005 Name=Stavební inženýrství, specializace Pozemní stavby, 5.semestr

124SF01	Building Physics	Z,ZK	6

Thermal performance of buildings Basic course on building physics. The first part of the course (lectures 1, 2) introduces basic principles of heat, air and moisture transfer in buildings and building components as a necessary background for further studies. The second part of the course (lectures 3 to 6) provides an introduction into the design and construction of buildings and building components with respect to building physics related issues. Typical tasks of building design and construction process related with the topics of the course will be presented as well as methods for their solution. A short information on selected diagnostic used for assessment of thermal performance of buildings methods will be presented. Lighting technology deals with two main parts, sun exposure and daylighting. In the first part, the listener will learn which objects are subject to requirements and what are the options for verifying the time of insolation. This part also includes the connection of the results with possible boundary conditions. The second part deals with the assessment of daylight mainly in the interiors of buildings with regard to the gradation of sky brightness, shading conditions and the characteristics of the room and the lighting opening. In acoustics, the listener is first introduced to the concepts of sound and noise, sound perception, basic quantities, sound sources and corresponding limits. The propagation of sound in the free and diffuse field, the propagation of sound through an obstacle or in the ear canal is also discussed. When assessing or designing the interiors of buildings, knowledge regarding sound absorption structures and sound insulation properties of dividing structures will be applied.

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

Code of the group: BC202006
Name of the group: Stavební inženýrství, specializace Pozemní stavby, 6.semestr
Requirement credits in the group: In this group you have to gain at least 30 credits
Requirement courses in the group: In this group you have to complete at least 5 courses
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
124KK01	**Non-Load Bearing Construction** *Lenka Hanzalová, Hana Gattermayerová, Šárka Šilarová, Pavel Kopecký, Kateřina Mertenová* ***Šárka Šilarová*** *Šárka Šilarová (Gar.)*	Z,ZK	7	2P+3C	L	P
124P01C	**Structural design project 1** *Malila Noori, Lenka Hanzalová, Jiří Pazderka, Jiří Novák, Kateřina Mertenová, Martin Jiránek* ***Jiří Pazderka*** *Jiří Pazderka (Gar.)*	KZ	6	4C	L	P
125TZ01	**Building services systems 1** *Karel Kabele, Stanislav Frolík* ***Karel Kabele*** *Karel Kabele (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** *Lukáš Velebil, Petr Kuklík, Anna Kuklíková* ***Anna Kuklíková*** *Jakub Dolejš (Gar.)*	Z,ZK	5	3P+1C	L	P

Characteristics of the courses of this group of Study Plan: Code=BC202006 Name=Stavební inženýrství, specializace Pozemní stavby, 6.semestr

124KK01	Non-Load Bearing Construction	Z,ZK	7

In the first part, the subject deals with the complex design of indoor and high-rise buildings, especially the influence of marginal conditions on the choice of material and structural variants and with an emphasis on envelope structures. In the second, more extensive part, the principles of solutions for roofs, perimeter walls, opening fillings and internal completion structures for various types of buildings are clearly discussed.

124P01C	Structural design project 1	KZ	6

Converting an architectural study of a smaller or medium-sized building for housing, administration, education, culture or sports into a detailed design of a building structure based on static analysis, interaction of load-bearing and non-load-bearing elements and building physics. Focus on complex approach to practical design, analysis and optimalization of a building structures. Design of variants of the load-bearing system, preliminary static analysis (calculation of load-bearing elements - slabs, columns, walls, etc), calculation of foundations, design of structures on the building envelope with respect to thermal protection of buildings, building physics, fire protection of buildings and protection against water and soil moisture. Elaboration of detailed drawings including floor plans, sections and details.

125TZ01	Building services systems 1	Z,ZK	5

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

Code of the group: BC202007
Name of the group: Stavební inženýrství, specializace Pozemní stavby, 7.semestr
Requirement credits in the group: In this group you have to gain at least 22 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 22
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
122TSC	**Construction Technology C** *Rostislav Šulc, Mária Párová **Rostislav Šulc** Rostislav Šulc (Gar.)*	Z,ZK	6	4P+2C	Z	P
123MAI	**Materials Engineering** *Milena Pavlíková, Zbyšek Pavlík **Milena Pavlíková** Zbyšek Pavlík (Gar.)*	Z,ZK	5	2P+2C	Z	P
124PDRC	**Failures, Deteriorations, Renovations** *Tomáš Čejka, Jiří Witzany **Radek Zigler** Radek Zigler (Gar.)*	Z,ZK	3	2P+1C	Z	P
124PS3C	**Building Structures 3C** *Hana Gattermayerová, Vladimír Žďára **Vladimír Žďára** Vladimír Žďára (Gar.)*	Z,ZK	3	2P+1C	Z	P
100ODPR	**Industrial Training (3 weeks)** *Jan Růžička, Petr Hájek, Kateřina Sojková **Michal Jandera** Michal Jandera (Gar.)*	Z	0	6C	Z,L	P
125TZ02	**Building Services Systems 2** *Bohumír Garlík, Daniel Adamovský **Daniel Adamovský** Daniel Adamovský (Gar.)*	Z,ZK	5	2P+2C	Z	P

Characteristics of the courses of this group of Study Plan: Code=BC202007 Name=Stavební inženýrství, specializace Pozemní stavby, 7.semestr

122TSC	Construction Technology C	Z,ZK	6
123MAI	Materials Engineering	Z,ZK	5
The course provides information on the building materials characterization and principles of designing and developing new types of materials having directed properties for specific building applications and structures.			
124PDRC	Failures, Deteriorations, Renovations	Z,ZK	3
In the lecture series, students are introduced to issues related to the protection of (not only) historic and heritage-protected buildings. In particular, these are defects and failures of buildings, load effects and influences from the point of view of load history; non-force effects and influences, effects of forced deformation; durability and reliability; mechanical, physical, chemical degradation and corrosion processes; failures , reconstruction and rehabilitation of foundation structures, brick structures, concrete structures (reinforced concrete), prefabricated structures, wooden structures of buildings, protection of buildings against increased humidity and diagnostics of buildings.			
124PS3C	Building Structures 3C	Z,ZK	3
The subject deals with the complex design of load-bearing structures of roofing, indoor and multi-storey buildings and the structural-static effect of the perimeter roof shell. In the first part, the attention is focused on span structures of sloping roofs and hall buildings and on structural-static problems of multi-storey buildings. In the second part, students will learn about the design of prefabricated indoor and multi-storey structures.			
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.			
125TZ02	Building Services Systems 2	Z,ZK	5
This subject includes an introduction to ventilation and air conditioning in buildings and solutions for electric instalations and artificial lighting.			

Code of the group: BC202008
Name of the group: Stavební inženýrství, specializace Pozemní stavby, 8.semestr
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 2 courses
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
124PBZN	**Fire Protection and Healthy Buildings** *Veronika Kačmaříková, Zuzana Rácová, Martin Jiránek, Petr Hejtmánek, Marek Pokorný, Vladimír Mózer **Martin Jiránek** Martin Jiránek (Gar.)*	Z,ZK	6	3P+2C	L	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=BC202008 Name=Stavební inženýrství, specializace Pozemní stavby, 8.semestr

124PBZN	Fire Protection and Healthy Buildings	Z,ZK	6

Fire Safety Analysis of fire - course of fire, burning process, fire loading; legislation and European Standards; fire safety solutions - fire project, requirement for fire resistance of buildings, escape ways, distance separation, fire-fighting equipment; fire behaviour of the most used materials (wood, steel, concrete, plastics); protection of building materials against fire (brickwork, concreting, plasters and sprays, coatings, impregnates of wood, encasements, glued facings of mineral fibres); sandwiches from fire point of view; influence of claddings on the course fire; passive protection of building structures - fire walls, fire glazed structures, fire ceiling, draft stops and seals; repressive measures - electric fire signalling, stationary extinguishing devices, smoke extract, hydrant systems. Healthy Buildings Constituents of indoor microclimate, hazardous substances (VOCs, HFRs, heavy metals, moulds, microbes, aerosols, radionuclides, etc.), their sources and health effects. Influence of building structures and materials on quality of indoor microclimate. Design of buildings with respect to optimisation of indoor microclimate.

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: BC202007_2
Name of the group: Stavební inženýrství, specializace Pozemní stavby, povinně volitelné předměty
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 3 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
101YAST	**Applied Statistics** *Daniela Jarušková* ***Jana Nosková*** *Daniela Jarušková (Gar.)*	Z	2	1P+1C	Z	PV
102YMES	**Measurement in Civil Engineering** *Petra Tichá, Petr Semerák, Vítězslav Vydra* ***Petr Semerák*** *Petr Semerák (Gar.)*	Z	2	2C	Z	PV
122YBPP	**Construction Safety Code** *Pavel Svoboda, Václav Pospíchal, Tomáš Váchal* ***Tomáš Váchal*** *Václav Pospíchal (Gar.)*	Z	2	1P+1C	Z	PV
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
124YBM1	**Building Information Modeling (BIM) for Building Structures 1** *Petr Matějka, Renáta Hoďánková, Pavel Chour, Jiří Černý, Hana Kabrhelová, Karel Fazekas* ***Jan Růžička*** *Jan Růžička (Gar.)*	Z	4	1P+3C	Z	PV
124YKSD	**Complex Structural Detail** *Jiří Pazderka, Radek Zigler* ***Jiří Pazderka*** *Jiří Pazderka (Gar.)*	Z	2	1P+1C	Z	PV
124YNAK	**Numerical Analysis of Building Structures** *Vladimír Žďára* ***Vladimír Žďára*** *Vladimír Žďára (Gar.)*	Z	2	1P+1C	Z	PV
124YSPB	**Curtain Walls** *Lenka Hanzalová, Šárka Šilarová* ***Šárka Šilarová*** *Šárka Šilarová (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
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
132YPV1	**Programming in C++ for Engineering Calculations 1** *Tomáš Koudelka, Anna Kučerová, Stanislav Šulc* ***Anna Kučerová*** *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

134YPDK	**Additional Timber and Metal Structures** *Jakub Dolejš **Jakub Dolejš** Jakub Dolejš (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
102POV1	**Fire and Explosion 1** *Petr Semerák **Petr Semerák** Petr Semerák (Gar.)*	Z	2	1P+1C	Z	PV
122YMKS	**Construction Quality Controlling** *Rostislav Šulc, Pavel Svoboda, Tomáš Váchal, Linda Veselá **Linda Veselá***	Z	2	1P+1C	L	PV
123YCHS	**Chemistry in Civil Engineering** *Milena Pavlíková, Martina Záleská **Milena Pavlíková** Milena Pavlíková (Gar.)*	Z	2	1P+1C	L	PV
123YNTP	**Numerical Analysis of Transport Processes** *Jiří Maděra, Václav Kočí **Jiří Maděra** Jiří Maděra (Gar.)*	Z	2	1P+1C	Z	PV
124YDRS	**Timber Buildings** *Jan Růžička, Jaroslav Vychytil, Kamil Staněk, Lukáš Velebil, Milan Peukert, Marek Pokorný **Jaroslav Vychytil** Jan Růžička (Gar.)*	Z	2	1P+1C	L	PV
124YLOP	**Lightweight Building Envelope** *Lenka Hanzalová, Šárka Šilarová **Šárka Šilarová** Šárka Šilarová (Gar.)*	Z	2	1P+1C	L	PV
124YPFS	**Precast concrete structures** *Radek Zigler, Jiří Witzany **Radek Zigler** Radek Zigler (Gar.)*	Z	2	1P+1C	L	PV
124YRHS	**Reconstruction of Historical Building Structures** *Radek Zigler, Tomáš Čejka, Jiří Witzany **Jiří Witzany** Jiří Witzany (Gar.)*	Z	2	1P+1C	L	PV
125YNST	**HVAC and services design** *Hana Kabrhelová **Hana Kabrhelová** Hana Kabrhelová (Gar.)*	Z	2	1P+1C	Z,L	PV
125YPMT	**Building services systems CAD, modelling and simulation** ***Stanislav Frolík** Stanislav Frolík (Gar.)*	Z	2	2C	Z,L	PV
126YVSF	**Small Business Management** *Jana Frková, Olga Heralová **Eduard Hromada** Eduard Hromada (Gar.)*	Z	2	1P+1C	Z,L	PV
132YPM1	**Computer Analysis of Structures 1** *Petr Fajman **Petr Fajman** 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
133YBKC	**Concrete and Masonry Structures 1** *Petr Bílý, Jakub Holan **Petr Bílý** Petr Bílý (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
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
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
135YPZU	**Underground structures in urban areas** *Jan Pruška **Jan Pruška** Jan Pruška (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

Characteristics of the courses of this group of Study Plan: Code=BC202007_2 Name=Stavební inženýrství, specializace Pozemní stavby, povinně volitelné předměty

101YAST	Applied Statistics	Z	2
Basic notions and terminology, random variable, descriptive and inferential statistics. Discrete and continuous random variables, normal distribution, log-normal distribution. Statistical methods, theory of estimation, hypotheses testing, simple linear regression.			
102YMES	Measurement in Civil Engineering	Z	2
As part of the course, students will learn about modern measuring methods in the construction industry. In practical laboratory tasks, groups will try to work with modern measuring devices and apparatus to determine elastic and deformation properties of building materials and structures, measurement and spectral analysis of sound, noise and vibrations, measurement of optical properties of materials, transmittance and reflectance of materials, determination of photometric and spectral characteristics of light sources, measurement of thermophysical parameters of building materials			
122YBPP	Construction Safety Code	Z	2
Healh and safety laws. Works in the trenches. Works at the height. Coordinator H&S when preparing and/or building constructions on a building site. Fire safety.			
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.			
124YBM1	Building Information Modeling (BIM) for Building Structures 1	Z	4
Building information model (BIM) - basic principles of creating a building information model in the field of civil engineering, specifics of BIM modeling. The subject uses the Autodesk Revit software base. Building information model in the life cycle of the building - information required during the design part, during construction and during use of the finished building.			
124YKSD	Complex Structural Detail	Z	2
The aim of the course is to extend the knowledge gained in previous courses - it is intended for students who have already reached advanced level of knowledge about structural problems in buildings. The content of the course is focused on the complex solution of construction details, following all legislative requirements and taking into account the maximum efficiency and durability of the chosen solution.			

124YNAK	Numerical Analysis of Building Structures	Z	2
The subject is focused on the practical modeling of various structural-static problems in particular. We will also focus on the problems of optimizing structures. The goal is to learn how to define a problem, convert it into a mathematical model, design a solution algorithm and write this algorithm in Excel or VBA. You'll learn how to use Excel effectively and write applications that you can use years from now. You will also definitely learn something about numerical modeling. I have been using Excel for work for 25 years and I would like to teach you how to use it effectively not only in building analysis models. Do not expect great science, but rather a practical approach to the problems you will encounter in practice.			
124YSPB	Curtain Walls	Z	2
Design principles for the design of roof coverings for sloping and steep roofs. The design of roof coverings in terms of requirements: building physical, waterproofing, operational, static, fire, acoustic, biological, chemical, lifetime and recycling. Principles of design of additional elements and details of roof coverings of flat, sloping and steep roofs based on the stated requirements and given boundary conditions.			
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.			
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.			
134YPDK	Additional Timber and Metal Structures	Z	2
Subject provides basic information regarding to design and application of supporting, working and industrial scaffolding systems. It is focused especialy on design rules in accordance with European codes and on modelling of structures.			
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.			
102POV1	Fire and Explosion 1	Z	2
Basic definitions of a fire, explosion and burning. Description, analysis and modeling of the forementioned processes. Temperature distribution field and its influence on the building constructions. Pressure distribution field and shock waves, their origination and propagation. Dynamic effects of the shock waves. Tension and stress in building constructions and materials caused by pressure waves and high temperatures. Fire extinguishing.			
122YMKS	Construction Quality Controlling	Z	2
The course is divided into two parts: quality control of the project documentation in terms of compliance with the implementing regulations and quality control of the works carried out. The scope of the subject is the quality control during the construction process with a focus on the quality of project documentation, monitoring of crucial parameters of construction and progress of works, management of changes during implementation. Construction quality assurance tools. Technical standards and regulations. Construction quality control. Material and product quality assurance. Listing of the most common errors at the level of project documentation and during the implementation of the construction delivery.			
123YCHS	Chemistry in Civil Engineering	Z	2
This course is designed for students interested in the natural sciences, combining theoretical and practical skills in building chemistry, without chemical formulas and equations. It touches on issues related to the composition, preparation, and use of basic building materials. It extends the knowledge acquired in Chemistry.			
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.			
124YDRS	Timber Buildings	Z	2
The aim is to present a complex overview on energy efficient timber structures. Basic theoretical and design principals are presented. The lectures are focused on following technologies of timber structures: (i) heavy timber skeleton systems, (ii) light timber structures based on 2x4. (iii) CLT, (iv) log house. All technologies of timber structures are presented in structural and building physics context of low energy and passive buildings.			
124YLOP	Lightweight Building Envelope	Z	2
The subject introduces the basics needed for the design of light outer skins, glazed roofs and skylights, it is focused on material characteristics and optimal selection of glazing units, their production and application. Students are introduced to the requirements for these constructions, the design principles and design principles of these constructions, including a concrete example of a design solution and a suitable material base Students are shown the possibilities of using glass in architecture, including realized constructions.			
124YPFS	Precast concrete structures	Z	2
Residential houses made of precast conrete panels, of which approx. 82 thousand were built in the period 1960-1995 do not meet the required extent of the current dynamically developing society and in many cases require the implementation of regeneration and modernization interventions enabling their full use. The course is focused on the current issues of renewal, reconstruction and modernization of precast houses, modernization of apartments in precast houses, on the issue of freeing parterres of precast houses for services, shops, offices, fitness centers, etc. Renovation, modernization, or regenerations require the removal of functionally inadequate completion structures, technical equipment, installations and, in some cases, even demanding interventions in supporting structures. As part of the construction of communication networks, modernization of urban development, etc., it is necessary in some cases to carry out partial or complete demolition of a precast panel building. As part of the regeneration of precast panel housing estates, an extension is also carried out, or completion of precast houses. The implementation of the mentioned plans requires a survey and diagnostics of supporting and peripheral structures, joints of parts and an evaluation of the structural-technical condition and an assessment of the residual life of precast panel structures and buildings.			

124YRHS	Reconstruction of Historical Building Structures	Z	2
In the period from the second half of the 19th century by 1960, more than 250 thousand of two- to five-story brick apartment (mainly rental) houses in traditional brick technology were constructed in the Czech Republic. Brick buildings from this period were built according to regulations, building codes and laws from the turn of the 19th and 20th centuries. Multi-storey brick tenement houses do not meet the current thermal, acoustic and other requirements, the requirements of a dynamically developing society to the required extent, and in many cases require regeneration and modernization interventions, including the replacement of non-compliant and out-of-date structures and equipment enabling their further use. The course is focused on the current issue of renewal, reconstruction and modernization of brick multi-storey rental apartment buildings, on historical structures and materials, the issue of degradation and aging of structures and materials of historic brick residential buildings, their residual life, failures and reconstruction of historical buildings and their parts. Furthermore, the course is focused on the issue of improving the well-being of the internal environment, the replacement of finishing structures, opening fillings, etc. as an integral part of the modernization of these buildings.			
125YNST	HVAC and services design	Z	2
Basic principles of the designing of sanitary systems, heating and ventilation. Design of the heat source, heat emitters, potable water demand, amount of ventilation air, design of air-handling unit and design of indoor systems.			
125YPMT	Building services systems CAD, modelling and simulation	Z	2
Introductory course in computer aided modelling and design of building services systems.			
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.			
132YPM1	Computer Analysis of Structures 1	Z	2
Static model of a structure. Computer codes RFEM-Dlubal, SCIA Engineer.			
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.			
133YBKC	Concrete and Masonry Structures 1	Z	2
Introduction to selected computer programs for structural modeling. Fundamentals of the finite element method. Basic types of elements for modeling of structures. Principles for choosing a suitable model. Practical procedures for the design and assessment of reinforced concrete structures using software tools. Principles and methods of interpretation and verification of results. Practical examples.			
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.			
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.			
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.			
135YPZU	Underground structures in urban areas	Z	2
Geotechnical investigation, basic conceptions of rock classification and properties evaluation, laboratory and field testing, elements of calculations in rock mechanics and underground construction, technology of underground constructions			
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.			

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: 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

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			

Name of the block: Povinně volitelné předměty, doporučení S1
Minimal number of credits of the block: 18
The role of the block: S1

Code of the group: BC202007_1
Name of the group: Stavební inženýrství, specializace Pozemní stavby, projekt
Requirement credits in the group: In this group you have to gain at least 6 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 6
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
123P02C	**Structural design project 2C** *Eva Vejmelková, Vojtěch Pommer, Zbyšek Pavlík, Martin Böhm* ***Alena Vimmrová***	KZ	6	4C	Z	S1
124P02C	**Structural design project 2C** *Lenka Hanzalová, Jiří Pazderka, David Šulc, Tomáš Čejka, Eva Burgetová* ***Jiří Pazderka*** *Jiří Pazderka (Gar.)*	KZ	6	4C	Z	S1
125P02C	**Structural design project 2C** ***Stanislav Frolík*** *Stanislav Frolík (Gar.)*	KZ	6	4C	Z	S1
133P02C	**Structural design project 2C** ***Jitka Vašková***	KZ	6	4C	Z	S1
134P02C	**Structural design project 2C** ***Michal Jandera*** *Michal Jandera (Gar.)*	KZ	6	4C	Z	S1
135P02C	**Structural design project 2C** *Jan Salák, Jiří Pazderka, Jan Kos, Jan Pruška* ***Jan Pruška***	KZ	6	4C	Z	S1

Characteristics of the courses of this group of Study Plan: Code=BC202007_1 Name=Stavební inženýrství, specializace Pozemní stavby, projekt

123P02C	Structural design project 2C	KZ	6
In accordance with the project proposal.			
124P02C	Structural design project 2C	KZ	6
Converting an architectural study of medium-scale building into a detailed design of a building structure based on static analysis, interaction of load-bearing and non-load-bearing elements and building physics. Focus on complex approach to practical design, analysis and optimalization of a building structures. Design of variants of the load-bearing system, preliminary static analysis (calculation of load-bearing elements - slabs, columns, walls, etc), calculation of foundations, design of structures on the building envelope with respect to thermal protection of buildings, building physics, fire protection of buildings and protection against water and soil moisture. Elaboration of detailed drawings including floor plans, sections and details.			
125P02C	Structural design project 2C	KZ	6
Independent project in the field of building services systems. Students choose out of the topics on offer and work on the text, calculations and graphical form of the project.			
133P02C	Structural design project 2C	KZ	6
Elaboration of the structural part of the project documentation for the given structure (part of the structure). The design of the selected variant of the structure with regard to the requirements of other professions. Structural analysis and drawing documentation to the extent specified during consultations. The Department of Architectural Engineering (K124) and Geotechnics (K135) collaborate in teaching in the course.			
134P02C	Structural design project 2C	KZ	6
Design of steel / timber load bearing building structure according to external requirements in relation to interaction of load bearing and final completion structural elements. The project is assigned by the seminar leader.			
135P02C	Structural design project 2C	KZ	6
Design, static calculation and drawing documentation of the building substructure			

Code of the group: BC202008_1
Name of the group: Stavební inženýrství, specializace Pozemní 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
102BAPC	**Bachelor Thesis** *Václav Nežerka* ***Jiří Novák***	Z	12	10C	L,Z	S1
123BAPC	**Bachelor Thesis** *Milena Pavlíková, Martina Záleská, Alena Vimmrová, Eva Vejmelková, Zbyšek Pavlík* ***Jan Pruška*** *Jan Pruška (Gar.)*	Z	12	10C	L,Z	S1
124BAPC	**Bachelor Thesis** *Jan Růžička, Petr Hájek, Malila Noori, Lenka Hanzalová, Jaroslav Vychytil, Běla Stibůrková, Jiří Pazderka, Jiří Nováček, Kamil Staněk, ...* ***Jan Pruška*** *Jan Pruška (Gar.)*	Z	12	10C	L,Z	S1
125BAPC	**Bachelor Thesis** ***Stanislav Frolík*** *Stanislav Frolík (Gar.)*	Z	12	10C	L,Z	S1
132BAPC	**Bachelor Thesis** *Tomáš Koudelka, Aleš Jíra, Michal Šejnoha, Martin Doškář, Anna Kučerová* ***Aleš Jíra***	Z	12	10C	L,Z	S1
133BAPC	**Bachelor Thesis**	Z	12	10C	L,Z	S1
134BAPC	**Bachelor Thesis** *Jiří Mareš* ***Michal Jandera*** *Michal Jandera (Gar.)*	Z	12	10C	L,Z	S1
135BAPC	**Bachelor Thesis** ***Jan Salák***	Z	12	10C	L,Z	S1

Characteristics of the courses of this group of Study Plan: Code=BC202008_1 Name=Stavební inženýrství, specializace Pozemní stavby, bakalářská práce

102BAPC	Bachelor Thesis	Z	12
in accordance with the thesis proposal			
123BAPC	Bachelor Thesis	Z	12
In accordance with the thesis proposal			
124BAPC	Bachelor Thesis	Z	12
The topics of bachelor's theses are based on the needs of practice or the scientific research activities of the department, scope and difficulty correspond to the student's knowledge acquired during bachelor's studies. The supervisor of the bachelor's thesis can designate additional consultants to the student.			
125BAPC	Bachelor Thesis	Z	12
Bachelor Thesis is the result of the Bachelor degree study programme. It should prove student`s ability to work independently in the area of Building Services Systems. The thesis can cover theoretical aspects or to focus on practical application on an object within building services systems. Students consult the supervisor and specialists from other departments. The thesis is presented in front of the commission.			
132BAPC	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.			
133BAPC	Bachelor Thesis	Z	12
A bachelor thesis is the qualification thesis of a bachelor's degree. It can take the form of processing the structural part of the building design project or research study on the topic of designing and application of a structural element with a variant comparative analysis or parametric study or performing and analysing experiments, etc.			
134BAPC	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.			
135BAPC	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 C spec.			

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.			
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 https://mat.fsv.cvut.cz/bubenik/mat1detail.htm	Z,ZK	6
101MA02	Mathematics 2 https://mat.fsv.cvut.cz/vyuka/bakalari/eng/ls/MT02/	Z,ZK	6
101MA03	Mathematics 3 https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/	Z,ZK	6

101YAST	Applied Statistics	Z	2
Basic notions and terminology, random variable, descriptive and inferential statistics. Discrete and continuous random variables, normal distribution, log-normal distribution. Statistical methods, theory of estimation, hypotheses testing, simple linear regression.			
102BAPC	Bachelor Thesis	Z	12
in accordance with the thesis proposal			
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.			
102POV1	Fire and Explosion 1	Z	2
Basic definitions of a fire, explosion and burning. Description, analysis and modeling of the forementioned processes. Temperature distribution field and its influence on the building constructions. Pressure distribution field and shock waves, their origination and propagation. Dynamic effects of the shock waves. Tension and stress in building constructions and materials caused by pressure waves and high temperatures. Fire extinguishing.			
102YMES	Measurement in Civil Engineering	Z	2
As part of the course, students will learn about modern measuring methods in the construction industry. In practical laboratory tasks, groups will try to work with modern measuring devices and apparatus to determine elastic and deformation properties of building materials and structures, measurement and spectral analysis of sound, noise and vibrations, measurement of optical properties of materials, transmittance and reflectance of materials, determination of photometric and spectral characteristics of light sources, measurement of thermophysical parameters of building materials			
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.			
122TSC	Construction Technology C	Z,ZK	6
122YBPP	Construction Safety Code	Z	2
Healh and safety laws. Works in the trenches. Works at the height. Coordinator H&S when preparing and/or building constructions on a building site. Fire safety.			
122YMKS	Construction Quality Controlling	Z	2
The course is divided into two parts: quality control of the project documentation in terms of compliance with the implementing regulations and quality control of the works carried out. The scope of the subject is the quality control during the construction process with a focus on the quality of project documentation, monitoring of crucial parameters of construction and progress of works, management of changes during implementation. Construction quality assurance tools. Technical standards and regulations. Construction quality control. Material and product quality assurance. Listing of the most common errors at the level of project documentation and during the implementation of the construction delivery.			
123BAPC	Bachelor Thesis	Z	12
In accordance with the thesis proposal			
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.			
123MAI	Materials Engineering	Z,ZK	5
The course provides information on the building materials characterization and principles of designing and developing new types of materials having directed properties for specific building applications and structures.			
123P02C	Structural design project 2C	KZ	6
In accordance with the project proposal.			
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.			
123YCHS	Chemistry in Civil Engineering	Z	2
This course is designed for students interested in the natural sciences, combining theoretical and practical skills in building chemistry, without chemical formulas and equations. It touches on issues related to the composition, preparation, and use of basic building materials. It extends the knowledge acquired in Chemistry.			

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.			
124BAPC	Bachelor Thesis	Z	12
The topics of bachelor's theses are based on the needs of practice or the scientific research activities of the department, scope and difficulty correspond to the student's knowledge acquired during bachelor's studies. The supervisor of the bachelor's thesis can designate additional consultants to the student.			
124KK01	Non-Load Bearing Construction	Z,ZK	7
In the first part, the subject deals with the complex design of indoor and high-rise buildings, especially the influence of marginal conditions on the choice of material and structural variants and with an emphasis on envelope structures. In the second, more extensive part, the principles of solutions for roofs, perimeter walls, opening fillings and internal completion structures for various types of buildings are clearly discussed.			
124P01C	Structural design project 1	KZ	6
Converting an architectural study of a smaller or medium-sized building for housing, administration, education, culture or sports into a detailed design of a building structure based on static analysis, interaction of load-bearing and non-load-bearing elements and building physics. Focus on complex approach to practical design, analysis and optimalization of a building structures. Design of variants of the load-bearing system, preliminary static analysis (calculation of load-bearing elements - slabs, columns, walls, etc), calculation of foundations, design of structures on the building envelope with respect to thermal protection of buildings, building physics, fire protection of buildings and protection against water and soil moisture. Elaboration of detailed drawings including floor plans, sections and details.			
124P02C	Structural design project 2C	KZ	6
Converting an architectural study of medium-scale building into a detailed design of a building structure based on static analysis, interaction of load-bearing and non-load-bearing elements and building physics. Focus on complex approach to practical design, analysis and optimalization of a building structures. Design of variants of the load-bearing system, preliminary static analysis (calculation of load-bearing elements - slabs, columns, walls, etc), calculation of foundations, design of structures on the building envelope with respect to thermal protection of buildings, building physics, fire protection of buildings and protection against water and soil moisture. Elaboration of detailed drawings including floor plans, sections and details.			
124PBZN	Fire Protection and Healthy Buildings	Z,ZK	6
Fire Safety Analysis of fire - course of fire, burning process, fire loading; legislation and European Standards; fire safety solutions - fire project, requirement for fire resistance of buildings, escape ways, distance separation, fire-fighting equipment; fire behaviour of the most used materials (wood, steel, concrete, plastics); protection of building materials against fire (brickwork, concreting, plasters and sprays, coatings, impregnates of wood, encasements, glued facings of mineral fibres); sandwiches from fire point of view; influence of claddings on the course fire; passive protection of building structures - fire walls, fire glazed structures, fire ceiling, draft stops and seals; repressive measures - electric fire signalling, stationary extinguishing devices, smoke extract, hydrant systems. Healthy Buildings Constituents of indoor microclimate, hazardous substances (VOCs, HFRs, heavy metals, moulds, microbes, aerosols, radionuclides, etc.), their sources and health effects. Influence of building structures and materials on quality of indoor microclimate. Design of buildings with respect to optimisation of indoor microclimate.			
124PDRC	Failures, Deteriorations, Renovations	Z,ZK	3
In the lecture series, students are introduced to issues related to the protection of (not only) historic and heritage-protected buildings. In particular, these are defects and failures of buildings, load effects and influences from the point of view of load history; non-force effects and influences, effects of forced deformation; durability and reliability; mechanical, physical, chemical degradation and corrosion processes; failures , reconstruction and rehabilitation of foundation structures, brick structures, concrete structures (reinforced concrete), prefabricated structures, wooden structures of buildings, protection of buildings against increased humidity and diagnostics of buildings.			
124PS3C	Building Structures 3C	Z,ZK	3
The subject deals with the complex design of load-bearing structures of roofing, indoor and multi-storey buildings and the structural-static effect of the perimeter roof shell. In the first part, the attention is focused on span structures of sloping roofs and hall buildings and on structural-static problems of multi-storey buildings. In the second part, students will learn about the design of prefabricated indoor and multi-storey structures.			
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.			
124SF01	Building Physics	Z,ZK	6
Thermal performance of buildings Basic course on building physics. The first part of the course (lectures 1, 2) introduces basic principles of heat, air and moisture transfer in buildings and building components as a necessary background for further studies. The second part of the course (lectures 3 to 6) provides an introduction into the design and construction of buildings and building components with respect to building physics related issues. Typical tasks of building design and construction process related with the topics of the course will be presented as well as methods for their solution. A short information on selected diagnostic used for assessment of thermal performance of buildings methods will be presented. Lighting technology deals with two main parts, sun exposure and daylighting. In the first part, the listener will learn which objects are subject to requirements and what are the options for verifying the time of insolation. This part also includes the connection of the results with possible boundary conditions. The second part deals with the assessment of daylight mainly in the interiors of buildings with regard to the gradation of sky brightness, shading conditions and the characteristics of the room and the lighting opening. In acoustics, the listener is first introduced to the concepts of sound and noise, sound perception, basic quantities, sound sources and corresponding limits. The propagation of sound in the free and diffuse field, the propagation of sound through an obstacle or in the ear canal is also discussed. When assessing or designing the interiors of buildings, knowledge regarding sound absorption structures and sound insulation properties of dividing structures will be applied.			
124YBM1	Building Information Modeling (BIM) for Building Structures 1	Z	4
Building information model (BIM) - basic principles of creating a building information model in the field of civil engineering, specifics of BIM modeling. The subject uses the Autodesk Revit software base. Building information model in the life cycle of the building - information required during the design part, during construction and during use of the finished building.			
124YDRS	Timber Buildings	Z	2
The aim is to present a complex overview on energy efficient timber structures. Basic theoretical and design principals are presented. The lectures are focused on following technologies of timber structures: (i) heavy timber skeleton systems, (ii) light timber structures based on 2x4. (iii) CLT, (iv) log house. All technologies of timber structures are presented in structural and building physics context of low energy and passive buildings.			

124YKSD	Complex Structural Detail	Z	2
The aim of the course is to extend the knowledge gained in previous courses - it is intended for students who have already reached advanced level of knowledge about structural problems in buildings. The content of the course is focused on the complex solution of construction details, following all legislative requirements and taking into account the maximum efficiency and durability of the chosen solution.			
124YLOP	Lightweight Building Envelope	Z	2
The subject introduces the basics needed for the design of light outer skins, glazed roofs and skylights, it is focused on material characteristics and optimal selection of glazing units, their production and application. Students are introduced to the requirements for these constructions, the design principles and design principles of these constructions, including a concrete example of a design solution and a suitable material base Students are shown the possibilities of using glass in architecture, including realized constructions.			
124YNAK	Numerical Analysis of Building Structures	Z	2
The subject is focused on the practical modeling of various structural-static problems in particular. We will also focus on the problems of optimizing structures. The goal is to learn how to define a problem, convert it into a mathematical model, design a solution algorithm and write this algorithm in Excel or VBA. You'll learn how to use Excel effectively and write applications that you can use years from now. You will also definitely learn something about numerical modeling. I have been using Excel for work for 25 years and I would like to teach you how to use it effectively not only in building analysis models. Do not expect great science, but rather a practical approach to the problems you will encounter in practice.			
124YPFS	Precast concrete structures	Z	2
Residential houses made of precast conrete panels, of which approx. 82 thousand were built in the period 1960-1995 do not meet the required extent of the current dynamically developing society and in many cases require the implementation of regeneration and modernization interventions enabling their full use. The course is focused on the current issues of renewal, reconstruction and modernization of precast houses, modernization of apartments in precast houses, on the issue of freeing parterres of precast houses for services, shops, offices, fitness centers, etc. Renovation, modernization, or regenerations require the removal of functionally inadequate completion structures, technical equipment, installations and, in some cases, even demanding interventions in supporting structures. As part of the construction of communication networks, modernization of urban development, etc., it is necessary in some cases to carry out partial or complete demolition of a precast panel building. As part of the regeneration of precast panel housing estates, an extension is also carried out, or completion of precast houses. The implementation of the mentioned plans requires a survey and diagnostics of supporting and peripheral structures, joints of parts and an evaluation of the structural-technical condition and an assessment of the residual life of precast panel structures and buildings.			
124YRHS	Reconstruction of Historical Building Structures	Z	2
In the period from the second half of the 19th century by 1960, more than 250 thousand of two- to five-story brick apartment (mainly rental) houses in traditional brick technology were constructed in the Czech Republic. Brick buildings from this period were built according to regulations, building codes and laws from the turn of the 19th and 20th centuries. Multi-storey brick tenement houses do not meet the current thermal, acoustic and other requirements, the requirements of a dynamically developing society to the required extent, and in many cases require regeneration and modernization interventions, including the replacement of non-compliant and out-of-date structures and equipment enabling their further use. The course is focused on the current issue of renewal, reconstruction and modernization of brick multi-storey rental apartment buildings, on historical structures and materials, the issue of degradation and aging of structures and materials of historic brick residential buildings, their residual life, failures and reconstruction of historical buildings and their parts. Furthermore, the course is focused on the issue of improving the well-being of the internal environment, the replacement of finishing structures, opening fillings, etc. as an integral part of the modernization of these buildings.			
124YSPB	Curtain Walls	Z	2
Design principles for the design of roof coverings for sloping and steep roofs. The design of roof coverings in terms of requirements: building physical, waterproofing, operational, static, fire, acoustic, biological, chemical, lifetime and recycling. Principles of design of additional elements and details of roof coverings of flat, sloping and steep roofs based on the stated requirements and given boundary conditions.			
125BAPC	Bachelor Thesis	Z	12
Bachelor Thesis is the result of the Bachelor degree study programme. It should prove student`s ability to work independently in the area of Building Services Systems. The thesis can cover theoretical aspects or to focus on practical application on an object within building services systems. Students consult the supervisor and specialists from other departments. The thesis is presented in front of the commission.			
125P02C	Structural design project 2C	KZ	6
Independent project in the field of building services systems. Students choose out of the topics on offer and work on the text, calculations and graphical form of the project.			
125TZ01	Building services systems 1	Z,ZK	5
Basic course in building services systems - water supply, drainage, gas supply and heating systems.			
125TZ02	Building Services Systems 2	Z,ZK	5
This subject includes an introduction to ventilation and air conditioning in buildings and solutions for electric instalations and artificial lighting.			
125YNST	HVAC and services design	Z	2
Basic principles of the designing of sanitary systems, heating and ventilation. Design of the heat source, heat emitters, potable water demand, amount of ventilation air, design of air-handling unit and design of indoor systems.			
125YPMT	Building services systems CAD, modelling and simulation	Z	2
Introductory course in computer aided modelling and design of building services 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.		
132BAPC	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.		
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.		
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.		
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.		
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.		
133BAPC	Bachelor Thesis	Z	12
	A bachelor thesis is the qualification thesis of a bachelor's degree. It can take the form of processing the structural part of the building design project or research study on the topic of designing and application of a structural element with a variant comparative analysis or parametric study or performing and analysing experiments, etc.		
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		
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).		
133P02C	Structural design project 2C	KZ	6
	Elaboration of the structural part of the project documentation for the given structure (part of the structure). The design of the selected variant of the structure with regard to the requirements of other professions. Structural analysis and drawing documentation to the extent specified during consultations. The Department of Architectural Engineering (K124) and Geotechnics (K135) collaborate in teaching in the course.		
133YBKC	Concrete and Masonry Structures 1	Z	2
	Introduction to selected computer programs for structural modeling. Fundamentals of the finite element method. Basic types of elements for modeling of structures. Principles for choosing a suitable model. Practical procedures for the design and assessment of reinforced concrete structures using software tools. Principles and methods of interpretation and verification of results. Practical examples.		
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.		

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.			
134BAPC	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.			
134P02C	Structural design project 2C	KZ	6
Design of steel / timber load bearing building structure according to external requirements in relation to interaction of load bearing and final completion structural elements. The project is assigned by the seminar leader.			
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.			
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.			
134YPDK	Additional Timber and Metal Structures	Z	2
Subject provides basic information regarding to design and application of supporting, working and industrial scaffolding systems. It is focused especialy on design rules in accordance with European codes and on modelling of structures.			
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.			
135BAPC	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 C spec.			
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			
135P02C	Structural design project 2C	KZ	6
Design, static calculation and drawing documentation of the building substructure			
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.			
135YPZU	Underground structures in urban areas	Z	2
Geotechnical investigation, basic conceptions of rock classification and properties evaluation, laboratory and field testing, elements of calculations in rock mechanics and underground construction, technology of underground constructions			
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			

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.			
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			
TV1	Physical Education	Z	0
TV2	Physical Education	Z	0

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