Study plan

Name of study plan: Stavební inženýrství, specializace Materiálové inženýrství

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 2024/2025

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:

Note on the C	յւսսը.					
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 K ivková, Iva Malechová, Michal Zdražil, Iva Slámová, Hana Lakomá, Petra Vacková, Jana ápová, Jozef Bobok Jana ápová Iva K ivková (Gar.)	Z,ZK	5	2P+2C	Z,L	Z
101MA01	Mathematics 1 Iva K ivková, Iva Malechová, Michal Zdražil, Iva Slámová, Jana ápová, Jozef Bobok, Michal Beneš, Zden k Skalák, Ond ej Zindulka, Aleš Nekvinda Aleš Nekvinda (Gar.)		6	2P+3C	Z,L	Z
105SVAI	Social Sciences and Architecture Josef Záruba Pfeffermann, Bo ivoj Marek, Rudolf Pošva, Dana ímanová, Jana Hrbková Josef Záruba Pfeffermann Josef Záruba Pfeffermann (Gar.)	Z,ZK	5	4P+1C	L	Z
123CHE	Chemistry Jana Náb Iková, Martin Keppert, Milena Pavlíková Milena Pavlíková Milena Pavlíková (Gar.)	Z,ZK	4	3P+1C	L	Z
132SM01	Structural Mechanics 1 Michal Polák, Daniel Rypl, Mat j Lepš, Šimon Glanc, Marek Tyburec, Tomáš Koudelka, Aleš Pali ka, Karel Pohl, Tomáš Plachý, Mat j Lepš Michal Polák (Gar.)	Z,ZK	6	2P+2C	Z,L	Z
135GM01	Geomechanics 1 Kate ina Ková ová, Jan Jelínek, Svatoslav Chamra Kate ina Ková ová	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

10111001	Constructive Connecty	_,_,	1
Projections and projection	ve methods. Axonometry. Oblique projection. Orthogonal axonometry. Displaying prisms, cones, cylinders, pyramids, balls. S	imple problems in	axonometry.
Basics of lighting of solid	ds and groupes of solids. Perspective projection. Curves, parametrisation. Frenet's trihedron, torsion and curvature. Helical s	urfaces. Quadrics	. Surfaces in
building industry.			

building industry.			
101MA01	Mathematics 1	Z,ZK	6
https://mat.fsv.cvut.cz/b	ubenik/mat1detail.htm		
105SVAI	Social Sciences and Architecture	Z.ZK	5

The subject combines the teaching of several social sciences - economics and economic policy, political science and law - with an overview of the development of architecture. Within economics, students will become familiar with basic economic concepts, the essence of economic and social policy and the place of construction in the economic structure. The content of the lectures on law is an overview of the institutions of Roman law, an interpretation of the constitution, human rights and selected legal norms, especially the new construction law. The political science part outlines the development of political thought in antiquity and in the period from the Renaissance to the present. Lectures on the history of architecture and construction provide a comprehensive explanation of the history of architecture from antiquity to postmodernism and deconstruction.

123CHE	Chemistry	Z,ZK	4
Introduction to general of	hemistry - chemical bond, compounds, reactions, equilibrium, Chemistry of environment - water, atmosphere, pedosphere, 0	Chemistry of buildi	ng 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

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.

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

135GM01 Geomechanics 1

the regional geology of the Czech Republic.

Z.ZK

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

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, Jozef Bobok, Ivana Pultarová Ivana Pultarová (Gar.)	Z,ZK	6	2P+3C	L,Z	Z
102FYI	Physics Pavel Novák Pavel Novák (Gar.)	Z,ZK	4	3P+1C	L	Z
123SH01	Building Materials Alena Vimmrová, Miloš Jerman Alena Vimmrová Alena Vimmrová (Gar.)	Z,ZK	5	2P+2C	Z,L	Z
126BIM1	BIM Petr Mat jka, Josef Žák Josef Žák (Gar.)	Z	1	1P+1C	Z	Z
132SM02	Structural Mechanics 2 Jitka N me ková, Jan Sýkora Michal Polák Michal Polák (Gar.)	Z,ZK	6	2P+2C	L,Z	Z
154SG01	Land Surveying in Civil Engineering Rudolf Urban 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/v	ryuka/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**

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

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 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.

Land Surveying in Civil Engineering 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, Michal Zdražil, Jozef Bobok, Michal Beneš, Zden k Skalák, Martin Soukenka, Monika Rencová, Jan Lama, Jan Dudák, Michal Beneš Michal Beneš (Gar.)	Z,ZK	6	3P+2C	Z,L	Z
124PSI1	Building Structures 11 Petr Hájek, Ctislav Fiala, Jan R ži ka, Martin Vonka, Eliška Kafková, Lenka Hanzalová, David Hes, Veronika Ka ma íková, Zuzana Rácová Ctislav Fiala Petr Hájek (Gar.)	Z	4	2P+1C	Z	Z
132PRPE	Strength of Materials Tomáš Koudelka, Petr Kabele, Milan Jirásek, Eva Novotná, Martin Došká, Dagmar Jandeková, Tomáš Med ický, Michael Somr, Tomáš Janda Milan Jirásek Petr Kabele (Gar.)	Z,ZK	6	3P+2C	Z,L	Z
135GM2I	Geomechanics 2l Jan Salák, Ji í Koš ál, Martin Vaní ek, Ivan Vaní ek Ivan Vaní ek Jan Salák (Gar.)	Z,ZK	5	2P+1C	Z	Z
141HYA	Hydraulics Michal Dohnal, Aleš Havlík, Tomáš Picek, Václav Matoušek, Jana Votrubová, Anna Špa ková, Jakub Novotný, Vojt ch Bareš, Jan Krupi ka, Václav Matoušek Michal Dohnal (Gar.)	Z,ZK	5	2P+2C	Z,L	Z
142VIZP	Water and Environmental Engineering Aleš Havlík, Martin Fencl, Eva Bílková, Michal Sn hota, Petr Nowak, Tomáš Dostál, Martin Do kal, Martin Šanda, Pavel Fošumpaur, 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	7 7K	6
	l e e e e e e e e e e e e e e e e e e e	Z,ZK	0
https://mat.fsv.cvut.cz/v	yuka/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

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 21 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

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

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 2l Petr Hájek, Veronika Ka ma íková, Tereza Pavl Ji í Pazderka Ji í Pazderka (Gar.)	Z,ZK	4	2P+1C	L	Z
126EKMN	Economics and Management Eduard Hromada, Martin ásenský, Božena Kade ábková, Petr Kal ev Eduard Hromada Eduard Hromada (Gar.)	Z,ZK	7	4P+2C		Z
132SM3	Structural Mechanics 3 Eva Novotná, Michal Šejnoha, Barbora Hálková Petr Kabele Petr Kabele (Gar.)	Z,ZK	5	2P+2C	L,Z	Z
133NNKB	Fundamentals of Structural Design - Concrete Martin Tipka Martin Tipka Martin Tipka (Gar.)	Z,ZK	4	2P+1C	L,Z	Z
134NNKO	Design of Supporting StructuresI - Steel František Wald Michal Jandera Michal Jandera (Gar.)	Z,ZK	3	2P+1C	L	Z

136DSUZ	Transport Structures and Urban Planning Ludvík Vébr, František Pospíšil, Ond ej Bret František Pospíšil	Z,ZK	7	5P+1C	L,Z	Z
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Characteristics of the courses of this group of Study Plan: Code=BJ20190400 Name=Stavební inženýrství, varianta J, 4. semestr

Building Structures 2I

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**

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.

Structural Mechanics 3

Z,ZK

132SM3 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.

Fundamentals of Structural Design - Concrete

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

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

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: 98

The role of the block: P

Code of the group: BM20240500

Name of the group: Stavební inženýrství, specializace Materiálové inženýrství, 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 7 courses

Credits in the group: 30

Note on the group:

1010 011 1110	g. 5 a p .					
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
123CHEM	Chemistry in Civil Engineering Milena Pavlíková, Martina Záleská Milena Pavlíková Milena Pavlíková (Gar.)	Z,ZK	5	2P+2C	Z	Р
123SSVM	Structural Analysis of Building Materials Martin Keppert Martin Keppert (Gar.)	KZ	3	2P+1C	Z	Р
123ZAZK	Principles of Material Testing Alena Vimmrová Alena Vimmrová Alena Vimmrová (Gar.)	Z,ZK	5	2P+2C	Z	Р
124STAO	Building Acoustics and Daylighting Jaroslav Vychytil, Ji í Nová ek Ji í Nová ek Ji í Nová ek (Gar.)	Z	3	2P+1C	Z	Р
124STTT	Hygrothermal Performance of Buildings Ji í Novák, Jakub Diviš Ji í Novák Ji í Novák (Gar.)	ZK	3	1P+1C	Z	Р
132ANKC	Analysis of Structures Dagmar Jandeková, Petr Konvalinka, Aleš Jíra, Jan Zatloukal Petr Konvalinka Petr Konvalinka (Gar.)	Z,ZK	5	2P+2C	Z	Р
133BK01	Concrete and Masonry Structures 1 Martin Tinka, Petr Bilú, litka Vašková Petr Bilú, Petr Bilú (Gar.)	Z,ZK	6	3P+2C	Z	Р

Characteristics of the courses of this group of Study Plan: Code=BM20240500 Name=Stavební inženýrství, specializace Materiálové inženýrství, 5. semestr

Chemistry in Civil Engineering

This course combines 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.

123SSVM Structural Analysis of Building Materials Students are supposed to get knowledge about relationships between structure of materials (chemical composition, microstructure) and their properties (mechanical, thermal, durability etc.). The methods of materials characterization both chemical and physical will be explained. Particular important relations will be illustrated by help of examples from the range (and not only) of building materials. Part of the lectures will be devoted individual groups of materials and their specific characterization techniques and properties **Principles of Material Testing** Testing and quality management. Building materials requirements. Pronciples of laboratory works - sampling, marking, documentation. Safety in laboratories. Testing and evaluation of results. Statistical methods of evaluation. 124STAO **Building Acoustics and Daylighting** 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 building acoustics, students are first introduced to the concepts of sound and noise, sound perception, basic quantities, sound sources and corresponding limits. The next part of the course deals with sound propagation in free and diffuse fields and sound propagation around barrier. Particular attention is paid to the sound insulation properties of partition structures and sound absorbing structures. 124STTT Hygrothermal Performance of Buildings ZK 3 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. Concrete and Masonry Structures 1 133BK01 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. Code of the group: BM20200600 Name of the group: Stavební inženýrství, specializace Materiálové inženýrství, 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 6 courses Credits in the group: 30 Note on the group: Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Code Completion Credits Scope Semester Role members) Tutors, authors and guarantors (gar.) Construction Technology C 122TSC 6 4P+2C Ζ Z,ZK Р Rostislav Šulc, Mária Párová **Řostislav Šulc** Rostislav Šulc (Gar.) **Materials for Monument Protection** 2 2P 123MAOP ΚZ L Zbyšek Pavlík Structural design project 1 124P01C ΚZ 6 4C L Р Lenka Hanzalová, Martin Jiránek Ji í Pazderka Ji í Pazderka (Gar.) **Building services systems 1** 125TBU Z,ZK 4 2P+2C L Ilona Koubková Concrete and Masonry Structures 2 Z,ZK 7 L 133BK02 4P+2C Marek Foglar Steel and Timber Structures 1340DKM Z,ZK 5 2P+2C Z,L Anna Kuklíková, Marta Ku íková Marta Ku íková Anna Kuklíková (Gar.) Characteristics of the courses of this group of Study Plan: Code=BM20200600 Name=Stavební inženýrství, specializace Materiálové inženýrství, 6. semestr 122TSC Construction Technology C 7.7K 123MAOP Materials for Monument Protection ΚZ 2 Building monuments consist from rather complicated collection of different materials and functions. It is important to obtain the information about the historical building technologies and materials with respect to the monument protection principles. These information will be obtained during the course. Structural design project 1 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. 125TBU Z,ZK Building services systems 1 4 Basic course in building services systems - water supply, drainage, gas supply , heating and ventilation systems.

protection, utilization. Timber - loadings, material propertie, limit states methodology, design, connections, bracings, protection of structural timber, timber bridges.

Steel structures - pros and contras, material properties, fabrication, connections, industrial steel buildings, cables, high strength steel, buildings in terms of water engineering - load,

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

Z,ZK

133BK02

Concrete and Masonry Structures 2

Steel and Timber Structures

Code of the group: BM20200700

Name of the group: Stavební inženýrství, specializace Materiálové inženýrství, 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 5 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
123EPMA	Sustainable Building Materials Miloš Jerman Miloš Jerman Miloš Jerman (Gar.)	Z,ZK	4	2P+2C	Z	Р
123VPMA	Influence of Environment on Building Materials Ji í Mad ra, Václav Ko í Václav Ko í Václav Ko í (Gar.)	Z,ZK	7	2P+2C	Z	Р
12900P	Preservation and Restoration of Monuments Klára Kroftová, Mat j Bohá Klára Kroftová Klára Kroftová (Gar.)	Z,ZK	5	2P+2C	Z	Р
210DIMA	Diagnostics of materials Radoslav Sovják, Ji í Litoš, Michal Mára, Šárka Pešková, Petr Hála, Kristýna Carrera, Petr Konrád, P emysl Kheml Radoslav Sovják Petr Konvalinka (Gar.)	Z,ZK	6	2P+2C	Z	Р
100ODPR	Industrial Training (3 weeks) Petr Hájek, Jan R ži ka, Kate ina Sojková Michal Jandera Michal Jandera (Gar.)	Z	0	6C	Z,L	Р

Characteristics of the courses of this group of Study Plan: Code=BM20200700 Name=Stavební inženýrství, specializace Materiálové inženýrství, 7. semestr

123EPMA Sustainable Building Materials Z.ZK The aim of the course is to introduce students to low-energy and environmentally oriented construction. Introductory classes will focus on legislation and energy performance of buildings. The course also looks at specific materials with a low carbon footprint. The course will not explicitly focus only on biomaterials, from a sustainability perspective it is necessary to combine modern synthetic materials with purely eco-friendly ones. The aim of the course is for students to be able to appropriately combine modern materials with purely natural ones, to be able to minimise the negative environmental impact of the construction industry, and to be able to create a pleasant interior with a healthy microclimate. Last but not least, to assess materials in terms of their entire life cycle, i.e. production, maintenance and subsequent disposal or better recycling.

123VPMA Influence of Environment on Building Materials

The main objective of the subject is to introduce advanced techniques that are increasingly exploited for an assessment effects and impacts of building materials exposed to various environment. The successful passing the course is supposed to provide deeper knowledge and inside to the problem in a complex way which is necessary for understanding the mutual materials-environment interactions. The students should be then able to solve particular problems independently using the most recent (advanced) methods to reveal possible risks of materials damage when exposed to various effects of environment.

12900P	Preservation and Restoration of Monuments	Z,ZK	5
210DIMA	Diagnostics of materials	Z,ZK	6
Review of tools for expe	rimental investigation of material, thermal and moisture properties of basic building materials, destructive and nondestructive	e tests of material	parameters,
accredited tests			

n 100ODPR Industrial Training (3 weeks) Professional practice is an important part of academic education in undergraduate degree programmes. The student will gain a basic understanding of duties and professional

Code of the group: BM20200800

Name of the group: Stavební inženýrství, specializace Materiálové inženýrství, 8. semestr

responsibilities. The professional practice evaluates the sum of all knowledge acquired through previous theoretical studies and is a proof of their acquisition.

Requirement credits in the group: In this group you have to gain at least 16 credits

Requirement courses in the group: In this group you have to complete at least 3 courses

Credits in the group: 16

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
123TVSM	Production technology of building materials Eva Vejmelková	Z,ZK	5	2P+2C	L	Р
126STMN	Construction Management Dana M š anová, Renáta Schneiderová Heralová, Zita Prost jovská, Jaroslava Tománková Martin ásenský Zita Prost jovská (Gar.)	Z,ZK	6	3P+2C	Z,L	Р
210DIST	Diagnostics of Buildings Ji i Litoš	Z,ZK	5	2P+2C	L	Р

Characteristics of the courses of this group of Study Plan: Code=BM20200800 Name=Stavební inženýrství, specializace Materiálové inženýrství. 8. semestr

,,				_
123TVSM	Production technology of building materials	Z,ZK	5]

126STMN	Construction Management

,ZK

Overview of selected concepts. Methods to support project management. Legal standards, SN 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.

210DIST Diagnostics of Buildings

Z.ZK

5

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

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 4

The role of the block: PV

Code of the group: BM20200700_2

Name of the group: Stavební inženýrství, specializace Materiálové inženýrství, povinn volitelné p edm ty

Requirement credits in the group: In this group you have to gain at least 4 credits

Requirement courses in the group: In this group you have to complete at least 1 course

Credits in the group: 4 Note on the group:

efficiency and durability of the chosen solution.

Note on the g	յւսաբ.					
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
123YSMA	Smart Building Materials Lukáš Fiala, Jan Fo t Lukáš Fiala Lukáš Fiala (Gar.)	Z	2	1P+1C	Z	PV
124YBM1	Building Information Modeling (BIM) for Building Structures 1 Petr Mat jka, Renáta Ho ánková, Pavel Chour, Hana Kabrhelová, Stanislav Frolík, Karel Fazekas Jan R ži ka Jan R ži ka (Gar.)	Z	4	1P+3C	Z	PV
124YKSD	Complex Structural Detail Radek Zigler Ji í Pazderka Ji í Pazderka (Gar.)	Z	2	1P+1C	Z	PV
132YNMI	Numerical Methods in Engineering Practice Petr Kabele, Jaroslav Kruis, Jan Zeman Milan Jirásek Milan Jirásek (Gar.)	Z	2	1P+1C	Z	PV
133YPRK	Failures and Rehabilitation of Concrete Structures Petr Štemberk, Jakub Žák Petr Štemberk Petr Štemberk (Gar.)	Z	2	1P+1C	Z	PV
134YNKS	Glass Structures Martina Eliášová Martina Eliášová (Gar.)	Z	2	1P+1C	L	PV
123YATP	Numerical Analysis of Transport Processes Ji í Mad ra	Z	2	1P+1C	L	PV
124YDRS	Timber Buildings Jaroslav Vychytil	Z	2	1P+1C	L	PV
124YRHS	Reconstruction of Historical Building Structures Ji í Witzany	Z	2	1P+1C	L	PV
133YMVB	Concrete and Masonry Structures 1 Petr Bílý	Z	2	1P+1C	L	PV
134YDUV	Timber and Sustainable Construction Anna Kuklíková	Z	2	1P+1C	L	PV
134YTSK	Thin-Walled and Composite Structures Michal Jandera	Z	2	1P+1C	L	PV

Characteristics of the courses of this group of Study Plan: Code=BM20200700_2 Name=Stavební inženýrství, specializace Materiálové inženýrství, povinn volitelné p edm tv

ilizellyrstvi, povili	ii voilleme p edin ty						
123YSMA	Smart Building Materials	Z	2				
The course content is a	The course content is an introduction to the study of sophisticated building materials (SMART materials) on the basis of cement-based materials and alkali-activated aluminosilicates						
with respect to the mat	with respect to the materials properties, optimization leading to achievement of desired sophisticated properties and usability in practice. The subject focuses mainly on new materials						
with a higher added val	ue and enables the students to get acquainted with the latest trends in the building industry. The subject also touches on the m	nulti-criteria evalua	ation of materials				
with respect to the prin	ciples of sustainable development.						
124YBM1	Building Information Modeling (BIM) for Building Structures 1	Z	4				
Building information mo	odel (BIM) - basic principles of creating a building information model in the field of civil engineering, specifics of BIM modeling	. The subject use	s 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.							

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 equ	uations, the finite
difference and finite element methods are explained from the viewpoints of an engineering scientist and a mathematician.		
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 means	ures. Methods of	strengthening
existing concrete structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of be	nding moment ar	nd shear, and
foundation structures are discussed. The course appropriately combines theoretical approaches with common practice.		
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 det	ailing 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 a		
properties of glass as structural material will be presented in comparison with other basic building materials, together with selected examples of glass		- 1
details and connecting technology, relevant technical regulations, specification and current methods applied in design will be described. Worked examples and current methods applied in design will be described.	nples will accomp	any the lectures
for better understanding, and design project will help to fix specific knowledge.		
123YATP 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 an		
Classification of mathematical models (diffusion-, convection- and mixed type). Computational models for solution of transport problems in porous space	•	
Introduction to structure and composition of computer codes WUFI and HEMOT, solution of simple transport problems (heat and moisture). Initial and	d boundary condi	tions 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		• •
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	ctures are preser	nted in structural
and building physics context of low energy and passive 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		
constructed in the Czech Republic. Brick buildings from this period were built according to regulations, building codes and laws from the turn of the 19		*
brick tenement houses do not meet the current thermal, acoustic and other requirements, the requirements of a dynamically developing society to the		
cases require regeneration and modernization interventions, including the replacement of non-compliant and out-of-date structures and equipment enais focused on the current issue of renewal, reconstruction and modernization of brick multi-storey rental apartment buildings, on historical structures and	-	
and aging of structures and materials of historic brick residential buildings, their residual life, failures and reconstruction of historical buildings and the		- 1
is focused on the issue of improving the well-being of the internal environment, the replacement of finishing structures, opening fillings, etc. as an internal environment, the replacement of finishing structures, opening fillings, etc. as an internal environment, the replacement of finishing structures, opening fillings, etc. as an internal environment, the replacement of finishing structures, opening fillings, etc. as an internal environment, the replacement of finishing structures, opening fillings, etc. as an internal environment, etc.	•	
these buildings.	sgrai part or the h	nodornization of
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. Intro		
reinforced concrete structures. Preparation of input data for numerical models. Design of structures using MATLAB. Presentation of selected program		
structures.	accigin	
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 design at the structural design and design at the structural design and design at the structural design at t	_	l
materials. Principles of strengthening and repairing of timber structures.		

Name of the block: Povinná t lesná výchova, sportovní kurzy

Thin-Walled and Composite Structures

Minimal number of credits of the block: 0

The role of the block: PT

134YTSK

Code of the group: BTV_POV

Name of the group: Povinná t lesná 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

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.

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

	ΓV1	Physical Education	Z	0
Г	ΓV2	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: Povinn 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, V ra ermáková, Alexandra Steinerová, Jarmila Fu íková, Lucie Simerová 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=Povinn 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: Povinn 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, V ra ermáková, Alexandra Steinerová, Jarmila Fu íková, Lucie Simerová, Svatava Boboková Bartíková Sandra Giormani (Gar.)	Z,ZK	2	2C		J
104YC2N	German 2 Svatava Boboková Bartíková Sandra Giormani Svatava Boboková Bartíková	Z,ZK	2	2C		J

Characteristics of the courses of this group of Study Plan: Code=BF20190302_J Name=Povinn 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: Povinn volitelné p edm ty, doporu ení S1

Minimal number of credits of the block: 18

The role of the block: S1

Code of the group: BM20200700 1

Name of the group: Stavební inženýrství, specializace Materiálové inženýrství, 7. semestr, 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
123P02M	Project 2M Alena Vimmrová, Zbyšek Pavlík, Jan Fo t, Eva Vejmelková, Lenka Scheinherrová, Martin Böhm Zbyšek Pavlík Zbyšek Pavlík (Gar.)	KZ	6	4C	Z	S1
210P02M	Project 2M Petr Konrád, Pavel Reiterman Pavel Reiterman Petr Konrád (Gar.)	KZ	6	4C	Z	S1

Characteristics of the courses of this group of Study Plan: Code=BM20200700_1 Name=Stavební inženýrství, specializace Materiálové inženýrství, 7. semestr, projekt

123P02M	Project 2M	KZ	6
In accordance with the			
210P02M	Project 2M	KZ	6

Code of the group: BM20200800_1

Name of the group: Stavební inženýrství, specializace Materiálové inženýrství, bakalá ská 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
123BAPM	Bachelor Project Jan Pruška Jan Pruška (Gar.)	Z	12	10C	L,Z	S1
210BAPM	Bachelor Project	Z	12	10C	L.Z	S1

Characteristics of the courses of this group of Study Plan: Code=BM20200800_1 Name=Stavební inženýrství, specializace Materiálové inženýrství, bakalá ská práce

123BAPM	Bachelor Project	Z	12		
In accordance with the	In accordance with the thesis proposal				
210BAPM	Bachelor Project	Z	12		

List of courses of this pass:

Code	Name of the course	Completion	Credits	
100ODPR	Industrial Training (3 weeks)	Z	0	
Professional pra	ctice is an important part of academic education in undergraduate degree programmes. The student will gain a basic understanding	of duties and prof	essional	
respons	sibilities. The professional practice evaluates the sum of all knowledge acquired through previous theoretical studies and is a proof o	f their acquisition.		
101KG01	Constructive Geometry	Z,ZK	5	
Projections and pr	ojective methods. Axonometry. Oblique projection. Orthogonal axonometry. Displaying prisms, cones, cylinders, pyramids, balls. Sim	ple problems in ax	conometry.	
Basics of lighting	of solids and groupes of solids. Perspective projection. Curves, parametrisation. Frenet's trihedron, torsion and curvature. Helical su	faces. Quadrics. S	urfaces in	
	building industry.			
101MA01	Mathematics 1	Z,ZK	6	
·	https://mat.fsv.cvut.cz/bubenik/mat1detail.htm		,	
101MA02	Mathematics 2	Z,ZK	6	
· ·	https://mat.fsv.cvut.cz/vyuka/bakalari/eng/ls/MT02/		1	
101MA03	Mathematics 3	Z,ZK	6	
·	https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/		1	
102FYI	Physics	Z,ZK	4	
This is a basic phy	sics course for students of the study programmes Civil Engineering; Management and Economics in Construction. The course focu	ses on mechanics	and basic	
thermodynamics. Th	e following areas are covered in the course: Mechanics of material points (particles) and deformable bodies. Discrete and continuou	is model of matter.	. Kinematics	
and dynamics of	f a material point (particle). Mechanical force fields. Gravitational field. Mechanical vibrations. Material deformation. Elastic waves. A	coustics. Hydrome	chanics.	
Fundamentals of thermodynamics. Heat transfer.				
104YC2A	English 2	Z,ZK	2	
English 2 Course co	ode: 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 ar Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata: Professional English for Civil Engineering (Units 6 10		Literature:
104YC2N	German 2	Z,ZK	2
· · ·	urse - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction indust the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Litera Deutsch im Bauwesen		
104YCA1	English 1	Z	1
English 1 Course o	bde: 104Y CA1 Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit The aim of the compulsory English cours	e is to enhance the	knowledge
of lexis and gran	nmar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on profes:	sional language (i.	e., ESP -
echnical style) and	communicative competence within the construction industry. The course also seeks to teach students to read technical literature and t	to be able to produ	ce essential
	nd to express themselves in writing on issues in their field of study. The end of course requirements are a credit. Literature: Horká Hana, Petra, Nivenová Renata: Professional English for Civil Engineering (Units 1 - 5)	, Giormani Sandra,	Martincová
104YCN1	German 1	Z	1
The compulsory co	urse - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction indust	ry, understanding	orofessional
texts, and learning	the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literative course requirement is a credit.	ature: A.Hanáková	, J.Dressel:
	Deutsch im Bauwesen		
105SVAI	Social Sciences and Architecture	Z,ZK	5
The subject combine	nes the teaching of several social sciences - economics and economic policy, political science and law - with an overview of the devel	opment of archited	ture. Within
economics, studen	ts will become familiar with basic economic concepts, the essence of economic and social policy and the place of construction in the ec	conomic structure.	The content
	aw is an overview of the institutions of Roman law, an interpretation of the constitution, human rights and selected legal norms, espec		
The political scien	ce part outlines the development of political thought in antiquity and in the period from the Renaissance to the present. Lectures on the	he history of archit	ecture and
	construction provide a comprehensive explanation of the history of architecture from antiquity to postmodernism and deconstru	,	
122TSC	Construction Technology C	Z,ZK	6
	6,7	Z	
123BAPM	Bachelor Project		12
	In accordance with the thesis proposal		
123CHE	Chemistry	Z,ZK	4
U	neral chemistry - chemical bond, compounds, reactions, equilibrium. Chemistry of environment - water, atmosphere, pedosphere. Che	, ,	
inorganic binders,	glass, ceramic, metals, natural polymers, wood, synthetic polymers on C and Si basis. Introduction to degradation of building materia	ls and to analytica	l chemistry.
123CHEM	Chemistry in Civil Engineering	Z,ZK	5
This course combi	nes theoretical and practical skills in building chemistry, without chemical formulas and equations. It touches on issues related to the	composition, prepa	aration, and
	use of basic building materials. It extends the knowledge acquired in Chemistry.		
123EPMA	Sustainable Building Materials	Z,ZK	4
	se is to introduce students to low-energy and environmentally oriented construction. Introductory classes will focus on legislation and en		of buildings.
	looks at specific materials with a low carbon footprint. The course will not explicitly focus only on biomaterials, from a sustainability per		_
combine modern s	on thetic materials with purely eco-friendly ones. The aim of the course is for students to be able to appropriately combine modern mate	erials with purely n	atural ones,
to be able to mini	mise the negative environmental impact of the construction industry, and to be able to create a pleasant interior with a healthy microc	climate. Last but no	t least, to
	assess materials in terms of their entire life cycle, i.e. production, maintenance and subsequent disposal or better recycling	1.	
123MAOP	Materials for Monument Protection	KZ	2
	nts consist from rather complicated collection of different materials and functions. It is important to obtain the information about the his		
Zananig mename	and materials with respect to the monument protection principles. These information will be obtained during the course.	otorioai bananig to	oo.og.oo
123P02M	Project 2M	KZ	6
1237 02101	In accordance with the project proposal.	NΔ	O
40001104		7 71/	
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. Intro	duction to
	material testing.		
123SSVM	Structural Analysis of Building Materials	KZ	3
	sed to get knowledge about relationships between structure of materials (chemical composition, microstructure) and their properties (r		-
	of materials characterization both chemical and physical will be explained. Particular important relations will be illustrated by help of o		range (and
	y) of building materials. Part of the lectures will be devoted individual groups of materials and their specific characterization technique	es and properties.	
123TVSM	Production technology of building materials	Z,ZK	5
123VPMA	Influence of Environment on Building Materials	Z,ZK	7
The main objetcive	e of the subject is to introduce advanced techniques that are increasingly exploited for an assessment effects and impacts of building		to various
environment. The s	uccessful passing the course is supposed to provide deeper knowledge and inside to the problem in a complex way which is necessar	y for understanding	the mutual
	ent interactions. The students should be then able to solve particular problems independently using the most recent (advanced) meth	-	-
	materials damage when exposed to various effects of environment.		
123YATP	Numerical Analysis of Transport Processes	Z	2
	grothermal conditions in civil engineering problems. Basic description of porous space. Description of transport processes (heat and r		
	thematical models (diffusion-, convection- and mixed type). Computational models for solution of transport problems in porous space based in the space of the spa		
	cture and composition of computer codes WUFI and HEMOT, solution of simple transport problems (heat and moisture). Initial and be		
	significance and impact to analysis of transport problems.		, pe,
123YSMA	Smart Building Materials	Z	2
	t is an introduction to the study of sophisticated building materials (SMART materials) on the basis of cement-based materials and all		
	materials properties, optimization leading to achievement of desired sophisticated properties and usability in practice. The subject foc		
•	rnaterials properties, optimization reading to achievement of desired sophisticated properties and disability in practice. The subject local value and enables the students to get acquainted with the latest trends in the building industry. The subject also touches on the multi-	=	
	with respect to the principles of sustainable development.	orandation	
123ZAZK	Principles of Material Testing	Z,ZK	5
	· ·		
resuring and quality	y management. Building materials requirements. Pronciples of laboratory works - sampling, marking, documentation. Safety in labora of results. Statistical methods of evaluation.	wies. iesung and	evaiuatiOH
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124P01C	Structural design project 1	KZ	6
_	itectural study of a smaller or medium-sized building for housing, administration, education, culture or sports into a detailed design of	_	
	raction of load-bearing and non-load-bearing elements and building physics. Focus on complex approach to practical design, analysis a	-	_
structures. Design (of variants of the load-bearing system, preliminary static analysis (calculation of load-bearing elements - slabs, columns, walls, etc), cal	culation of foundati	ıons, aesign

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. 124PSI1 **Building Structures 1I** 7 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** 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. **Building Acoustics and Daylighting** 124STAO 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 building acoustics, students are first introduced to the concepts of sound and noise, sound perception, basic quantities, sound sources and corresponding limits. The next part of the course deals with sound propagation in free and diffuse fields and sound propagation around barrier. Particular attention is paid to the sound insulation properties of partition structures and sound absorbing structures. 124STTT Hygrothermal Performance of Buildings ΖK 3 124YBM1 Building Information Modeling (BIM) for Building Structures 1 4 7 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 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 7 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. 124YRHS Reconstruction of Historical Building Structures 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. 125TBU Z,ZK 4 Building services systems 1 Basic course in building services systems - water supply, drainage, gas supply , heating and ventilation systems. 126BIM1 BIM 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. 126FKMN **Economics and Management** 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, SN 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. 12900P Preservation and Restoration of Monuments Z.ZK 5 Analysis of Structures 132ANKC 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 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. Structural Mechanics 1 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.
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.
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. 13. 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 78.Introduction to pre-stressed concrete: design of pre-stressing, losses of pre-stressing,
technology 912. 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).
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. 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.
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. 1340DKM Steel and Timber Structures Z,ZK 5
134ODKM Steel and Timber Structures Z,ZK 5 Steel structures - pros and contras, material properties, fabrication, connections, industrial steel buildings, cables, high strength steel, buildings in terms of water engineering - load,
protection, utilization. Timber - loadings, material propertie, limit states methodology, design, connections, bracings, protection of structural timber, timber bridges.
134YDUV Timber and Sustainable Construction Z 2
Introduction to sustainable use of wood in construction with respect to previous courses. Theoretical methods of structural design and design of structures composed from different
materials. Principles of strengthening and repairing of timber structures.
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. 135GM01
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
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

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

210BAPM	Bachelor Project	Z	12
210DIMA	Diagnostics of materials	Z,ZK	6
Review of tools for experimental investigation of material, thermal and moisture properties of basic building materials, destructive and nondestructive tests of material parameters			
accredited tests.			

210DIST Diagnostics of Buildings Z,ZK 5

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

210P02M	Project 2M	KZ	6
TV1	Physical Education	Z	0
TV2	Physical Education	Z	0

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2025-11-05, time 20:28.