### Study plan

## Name of study plan: Stavební inženýrství, specializace Inženýrství životního prostředí

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch: Program of study: Civil Engineering Type of study: Bachelor full-time

Required credits: 240 Elective courses credits: 0 Sum of credits in the plan: 240

Note on the plan: tento studijní plán platí od akademického roku 2020/21

Name of the block: Compulsory courses Minimal number of credits of the block: 117

The role of the block: Z

Code of the group: BJ20190100

Name of the group: Stavební inženýrství, varianta J, 1. semestr

Requirement credits in the group: In this group you have to gain at least 29 credits

Requirement courses in the group: In this group you have to complete at least 6 courses

Credits in the group: 29 Note on the group:

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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 <b>Jana Čápová</b> Iva Křivková (Gar.)	Z,ZK	5	2P+2C	Z,L	Z
101MA01	Mathematics 1 Iva Křivková, Iva Malechová, Michal Zdražil, Iva Slámová, Jana Čápová, Jozef Bobok, Michal Beneš, Zdeněk Skalák, Ondřej Zindulka, Aleš Nekvinda Aleš Nekvinda (Gar.)	Z.Z.N	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, Šimon Glanc, Marek Tyburec, Tomáš Koudelka, Aleš Palička, Karel Pohl, Tomáš Plachý, Matěj Lepš Michal Polák (Gar.)	Z,ZK	6	2P+2C	Z,L	Z
135GM01	Geomechanics 1 Kateřina Kovářová, Jan Jelínek, Svatoslav Chamra Kateřina Kovářová	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 project	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.							

building industry.			
101MA01	Mathematics 1	Z,ZK	6
https://mat.fsv.cvut.cz/b	ubenik/mat1detail.htm		
105SVAI	Social Sciences and Architecture	7 7K	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	chemistry - chemical bond, compounds, reactions, equilibrium. Chemistry of environment - water, atmosphere, pedosphere	. Chemistry of build	ing 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.

135GM01 Geomechanics 1

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, 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 Matějka, Josef Žák <b>Josef Žák</b> Josef Žák (Gar.)	Z	1	1P+1C	Z	Z
132SM02	Structural Mechanics 2 Jitka Němečková, 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	yuka/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

Z.ZK

Code of the group: BJ20190300

of real estates Laws and decrees for geodesy and build-up in Czech Republic

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, Zdeněk Skalák, Martin Soukenka, Monika Rencová, Jan Lamač, Jan Dudák, Michal Beneš Michal Beneš (Gar.)	Z,ZK	6	3P+2C	Z,L	Z
124PSI1	Building Structures 11 Petr Hájek, Ctislav Fiala, Jan Růžička, Martin Vonka, Eliška Kafková, Lenka Hanzalová, David Hes, Veronika Kačmaříková, 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 Doškář, Dagmar Jandeková, Tomáš Medřický, Michael Somr, Tomáš Janda <b>Milan</b> Jirásek Petr Kabele (Gar.)	Z,ZK	6	3P+2C	Z,L	Z
135GM2I	Geomechanics 2l Jan Salák, Jiří Košťál, Martin Vaníček, Ivan Vaníček Ivan Vaníček Jan Salák (Gar.)	Z,ZK	5	2P+1C	Z	Z
141HYA	Hydraulics Tomáš Picek, Václav Matoušek, Jana Votrubová, Michal Dohnal, Vojtěch Bareš, Jan Krupička, Martin Fencl Václav Matoušek Michal Dohnal (Gar.)	Z,ZK	5	2P+2C	Z,L	Z
142VIZP	Water and Environmental Engineering Martin Fencl, Eva Bílková, Michal Sněhota, Petr Nowak, Tomáš Dostál, Martin Dočkal, Martin Šanda, Pavel Fošumpaur, Bohumil Šťastný, Martin Horský Ladislav Satrapa (Gar.)		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

TOTIVIAUS	Mathematics 3	∠,∠r\	O				
https://mat.fsv.cvut.cz/vy	https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/						
124PSI1	Building Structures 1I	Z	4				
The concept of design of	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, intera	ction of elements, spatial effect of the structural system. Vertical load-bearing structures (functions, requirements, principles	of the structural d	lesign of walls,				
columns), floor structure	s (functions, requirements, principles of the structural design of vaults, wooden ceilings, reinforced concrete ceilings, ceramic	concrete ceilings	s, steel and steel				
concrete ceilings). Expa	nsion 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 the	ory of elasticity: stress and strain of straight beams subjected to bending and free torsion, ultimate plastic capacity of a men	nber in bending, c	ritical 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.

42VIZP 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 Kačmaříková, Tereza Pavlů <b>Jiří Pazderka</b> Jiří Pazderka (Gar.)	Z,ZK	4	2P+1C	L	Z
126EKMN	Economics and Management  Eduard Hromada, Martin Čásenský, Božena Kadeřábková, Petr Kalčev 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, Ondřej Bret František Pospíšil	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

**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.

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.

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).

Design of Supporting StructuresI - Steel 134NNKO

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: 92

The role of the block: P

Code of the group: BZ202005

Name of the group: Stavební inženýrství, specializace Inženýrství životního prostředí, 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
127VEIS	Public Infrastructure  Václav Jetel	Z,ZK	7	3P+2C	Z	Р
133BZKZ	Concrete and Masonry Structures  Michaela Frantová	Z,ZK	5	2P+2C	Z	Р
135ZSH	Foundations and Hydrogeology  Kateřina Kovářová	Z,ZK	7	4P+2C	Z	Р
141KMH	Climatology, Meteorology, Hydrology Michal Dohnal	Z,ZK	6	3P+2C	Z	Р
143PED	Soil Science Michal Sněhota	Z,ZK	5	2P+2C	Z	Р

Characteristics of the courses of this group of Study Plan: Code=BZ202005 Name=Stavební inženýrství, specializace Inženýrství životního prostředí, 5. semestr

127VEIS	Public Infrastructure	Z,ZK	7
The aim of the course is		•	
133BZKZ	Concrete and Masonry Structures	Z,ZK	5

The course lectures is focused on the design of one-way and two-way slabs, staircases, reinforcing walls, foundations, precast structures, halls and prestressed concrete. The course also covers masonry construction and an introduction to the design of civil engineering structures and bridges. The content of the practicum is the application of the knowledge and skills on the real structures.

Foundations and Hydrogeology Principles of design of foundation structures according to Eurocode principles. Types of foundation structures. Building pits. Basic information on the hydrogeological environment and groundwater chemistry. Aggressive waters. Groundwater tapping. 141KMH Climatology, Meteorology, Hydrology Z,ZK The course focuses on the following thematic areas: General circulation of the atmosphere, climate factors and climate zones. Composition and structure of the atmosphere, water in the atmosphere. Air masses and fronts. Cloud development and precipitation. Hydrologic cycle and hydrologic balance. Interception, infiltration, evaporation. Runoff generation, rainfall-runoff relationships, flood routing, discharge measurement. Frequency analysis of extreme events. Hydrologic design. 143PED Z,ZK

Soil and the environment. Soil genesis, pedogenetic factors. Soil structure and texture. Physical and physiochemical soil properties. Physical, chemical and biological processes in soils. Soil classification. Soil survey and mapping. Soils of the world. Clay minerals, soil chemistry. Hydrostatic and hydrodynamic behaviour of soil water, capillarity. Determination of soil moisture. Flow of water in variably saturated porous media

Code of the group: BZ202006

Name of the group: Stavební inženýrství, specializace Inženýrství životního prostředí, 6. semestr

Requirement credits in the group: In this group you have to gain at least 25 credits

Requirement courses in the group: In this group you have to complete at least 5 courses

Credits in the group: 25

Note on the group:

135ZSH

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
134ODKV	Steel and Timber Structures Marta Kuříková, Anna Kuklíková Marta Kuříková (Gar.)	Z,ZK	5	2P+2C	Z,L	Р
141VTO	Water Courses Petr Sklenář	Z,ZK	5	3P+1C	L	Р
143GIPU	GIS and Land Consolidation  Miroslav Bauer	Z,ZK	7	4P+3C	L	Р
144VHOB	Urban water management  Jana Nábělková	Z,ZK	6	4P+2C	L	Р
141VYV1	Fieldwork Training (1 week)  Michal Dohnal	Z	2	2C	L	Р

#### Characteristics of the courses of this group of Study Plan: Code=BZ202006 Name=Stavební inženýrství, specializace Inženýrství životního prostředí, 6. semestr

134ODKV 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 te	rms of water engi	neering - load,
protection, utilization. Timber - loadings, material propertie, limit states methodology, design, connections, bracings, protection of structural timber, ti	mber bridges.	
141VTO Water Courses	Z,ZK	5
Students meet geomorphic fluvial processes taking place in river channels, expand their knowlege in the field of river hydraulics and river training te	chnology and gair	an idea of
administration, maintenance and management of rivers in the Czech Republic. In practical part students are requested to prepare a report on asses	ment of river reac	h of own choice
with aim to identify problems to be solved.		
143GIPU GIS and Land Consolidation	Z,ZK	7
Two parallel blocks of instruction - Land consolidation and basics of geomatics (GIS applied for KPÚ). Basics of land consolidation - history, course	and phases of the	KPÚ process,
principles of designing common facilities, legislation. Introduction to GIS and main components of common systems. Data structure and basics of im	age information p	rocessing from
geographically localized data. Basics of databases and work with vector and raster formats of geographic data. GIS in engineering practice and land	scape engineering	g. Preparation of
a digital terrain model, land use maps and other inputs and available databases in the Czech Republic. Processing of remote sensing data.		
144VHOB Urban water management	Z,ZK	6
Hydrochemistry: Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds	. Non-electrolytes.	Organic matter.
Self-purification. Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste w	aters. Water distri	bution system:
Water sources. Systems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewer	age networks. Sev	werage objects.
Combined sewer overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant	t. mechanical clea	ning. Biological
treatment. Removal of nitrogen and phosphorus. Sludge		
141VYV1 Fieldwork Training (1 week)	Z	2
Not applicable.	,	

Code of the group: BZ202007

Name of the group: Stavební inženýrství, specializace Inženýrství životního prostředí, 7. semestr

Requirement credits in the group: In this group you have to gain at least 19 credits

Requirement courses in the group: In this group you have to complete at least 4 courses

Credits in the group: 19

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
136DSZP	Transport Structures and Environment Lenka Lomoz, Jan Hradil Jan Hradil Jan Hradil (Gar.)	Z,ZK	6	3P+2C	Z	Р

1430DKO	Waste Management and Contamination Michal Sněhota, Martin Dočkal, Martin Šanda Martin Šanda Martin Dočkal (Gar.)	Z,ZK	6	3P+2C	Z	Р
143TOKT	Landscape Design and Protection Petr Kavka Martin Neumann Petr Kavka (Gar.)	Z,ZK	7	2P+2C	Z	Р
100ODPR	Industrial Training (3 weeks) Petr Hájek, Jan Růžička, Kateřina Sojková Michal Jandera Michal Jandera (Gar.)	Z	0	6C	Z,L	Р

# Characteristics of the courses of this group of Study Plan: Code=BZ202007 Name=Stavební inženýrství, specializace Inženýrství životního prostředí, 7. semestr

136DSZP Transport Structures and Environment Z,ZK 6
The course is designed as an introduction to the problems of the relationship between road and rail transport and the environment. In more detail, it is aimed at the issue of noise and

anti-noise measures from the point of view of a civil engineer in the field of rail transport. In the field of road transport, the subject is focused on traffic calming and control, solutions for urban and pedestrian zones, solutions for non-motorized traffic, including material, technological and design solutions.

143ODKO Waste Management and Contamination

Z,ZK

| 6

Principles of linear and circular economy with a focus on construction and municipal waste. Waste collection, utilization and disposal systems (municipal, construction waste). Landfill security, landfill gas, landfill technology and post-closure reclamation. Measurement of waste production, biowaste management-composting and anaerobic digestion. Radioactive waste in the Czech Republic. Remediation of pollution - remediation methods to decontaminate the territory.

143TOKT	Landscape Design and Protection	Z,ZK	7
100ODPR	Industrial Training (3 weeks)	Z	0

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

Code of the group: BZ202008

Name of the group: Stavební inženýrství, specializace Inženýrství životního prostředí, 8. semestr

Requirement credits in the group: In this group you have to gain at least 18 credits

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

Credits in the group: 18 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
122TSVZ	Technology of Construction Z Rostislav Sulc	Z,ZK	6	4P+2C	L	Р
126STMN	Construction Management Dana Měšťanová, Renáta Schneiderová Heralová, Zita Prostějovská, Jaroslava Tománková Martin Čásenský Zita Prostějovská (Gar.)	Z,ZK	6	3P+2C	Z,L	Р
143DEOK	Dendrology and Landscape Protection  Martin Dočkal	Z,ZK	6	3P+3C	L	Р

## Characteristics of the courses of this group of Study Plan: Code=BZ202008 Name=Stavební inženýrství, specializace Inženýrství životního prostředí, 8. semestr

122TSVZ	Technology of Construction Z	Z,ZK	6
126STMN	Construction Management	Z,ZK	6
Overview of coloeted a	anageta Mathada ta gunnart project management Logal standarda ČCN and ICO standarda. The acceptial apparts of Brojec	t Managament C	onetruction on a

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

The subject represents a synthesis of topics related to applied ecology and at the same time dendrology, focused on practical use in the creation and protection of the landscape as

143DEOK Dendrology and Landscape Protection

well as within urbanized units.

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:

Page 6 out of 15

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

Characteristics of the courses of this group of Study Plan: Code=BTV\_POV Name=Povinná tělesná výchova

TV1	Physical Education	Z	0
TV2	Physical Education	Z	0

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 6

The role of the block: S

Code of the group: BZ202007\_2

Name of the group: Stavební inženýrství, specializace Inženýrství životního prostředí, povinně volitelné

předměty

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
141YHMM	Hydroecological monitoring and modeling Jana Votrubová, Michal Dohnal Michal Dohnal Michal Dohnal (Gar.)	Z,ZK	6	3P+2C	Z	S
143YPEO	Erosion Protection Tomáš Dostál Tomáš Dostál (Gar.)	Z,ZK	6	3P+2C	Z	S
127YPSK	Town and Regional Planning of Settlements and Landscape  Jiří Kupka, Daniel Stojan, Václav Jetel <b>Jiří Kupka</b> Jiří Kupka (Gar.)	Z,ZK	6	3P+2C	Z	S

#### Characteristics of the courses of this group of Study Plan: Code=BZ202007 2 Name=Stavební inženýrství, specializace Inženýrství životního prostředí, povinně volitelné předměty

4.44 \/	I hadro and principle required and recording	7 71/					
141YHMM	Hydroecological monitoring and modeling	Z,ZK	р				
General principles of meteorological measurement, data resources, and measurement design. Meteorological and climatic measurements. Hydrological measurements. Tracers in							
experimental hydrology	experimental hydrology. Remote sensing for hydrology and meteorology. Evapotranspiration measurements. Data analysis. Modeling in hydrology. Modeling in ecology and biology.						
Inverse modeling.							
143YPEO	Erosion Protection	Z,ZK	6				
Basic problems of soil 6	rosion process, its risks and negative effects. Basic principles of catchment management. Negative effects of soil erosion on	individual parts o	of landscape and				
society. Methods of soil	loss and sediment transport determination, design of soil erosion control measures. State tools and policies in soil conserva	tion.					
127YPSK	Town and Regional Planning of Settlements and Landscape	Z,ZK	6				
The course taught in the field of Environmental Engineering is an introduction to urbanism, urban design, spatial and regional planning as a basis for the preparation of a bachelor's							
thesis at the Den of Lirk	thesis at the Den of Lithan Design. Town and Regional Planning. It complements the semester projects with theory and a broader professional context and is a preparation for the part						

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

of the state bachelor's exam organized by the Dep. of Urban Design, Town and Regional Planning.

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, Alexandra Steinerová, Jarmila Fučíková, Lucie Simerová <b>Svatava Boboková Bartíková</b> 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 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 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, Alexandra Steinerová, Jarmila Fučíková, Lucie Simerová, Svatava Boboková Bartíková Sandra Giormani (Gar.)	Z,ZK	2	2C	Z,L	J
104YC2N	German 2 Svatava Boboková Bartíková Sandra Giormani Svatava Boboková Bartíková (Gar.)	Z,ZK	2	2C	Z,L	J

Characteristics of the courses of this group of Study Plan: Code=BF20190302\_J Name=Povinně volitelný jazyk, 3. semesti

104YC2A English 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 Z.ZK German 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:

Name of the block: Povinně volitelné předměty, doporučení S1

Minimal number of credits of the block: 22

The role of the block: S1

Code of the group: BZ202006\_1

Name of the group: Stavební inženýrství, specializace Inženýrství životního prostředí, projekt, 6. semestr

Requirement credits in the group: In this group you have to gain at least 5 credits

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

Credits in the group: 5 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
127PZ01	Project Design 1 Marek Janatka	KZ	5	4C	L	S1
141PZ01	Project Design 1 Michal Dohnal	KZ	5	4C	L	S1
142PZ01	Project Design 1 Martin Králík	KZ	5	4C	L	S1
143PZ01	Project Design 1 Václav David	KZ	5	4C	L	S1

Characteristics of the courses of this group of Study Plan: Code=BZ202006\_1 Name=Stavební inženýrství, specializace Inženýrství životního prostředí, projekt, 6. semestr

127PZ01	Project Design 1	KZ	5			
The project is tought in	The project is tought in cooperation with other departments. Preparation for bachelor thesis, collecting the information, preparation of data, state of art.					
141PZ01	Project Design 1	KZ	5			
The Project Design 1 at the Department of Hydraulics and Hydrology is focused on the modeling of the water component of the environment or the hydrological analysis of a selecte						
catchment.						
142PZ01	Project Design 1	KZ	5			
The project is tought in	cooperation with other departments. Preparation for bachelor thesis, collecting the information, preparation of data, state of a	ırt.				
143PZ01	Project Design 1	KZ	5			
Students will work on a study of the construction of a small water reservoir and on the revitalization of a small water courses under the reservoir. The study will include a textual,						
computational and drav	computational and drawing part.					

Code of the group: BZ202007\_1

Name of the group: Stavební inženýrství, specializace Inženýrství životního prostředí, projekt, 7. semestr Requirement credits in the group: In this group you have to gain at least 5 credits

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

Credits in the group: 5

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
101PZ02	Project Design 2 Jozef Bobok Jozef Bobok (Gar.)	KZ	5	4C	Z	S1
125PZ02	Project Design 2 Ilona Koubková Ilona Koubková (Gar.)	KZ	5	4C	Z	S1
127PZ02	Project Design 2 František Pospíšil, Simona Vondráčková, Václav Jetel František Pospíšil Václav Jetel (Gar.)	KZ	5	4C	Z	S1
133PZ02	Project Design 2  Jitka Vašková	KZ	5	4C	Z	S1
135PZ02	Project Design 2	KZ	5	4C	Z	S1
136PZ02	Project Design 2	KZ	5	4C	Z	S1
137PZ02	Project Design 2 Lenka Lomoz Lenka Lomoz (Gar.)	KZ	5	4C	Z	S1
141PZ02	Project Design 2 Michal Dohnal, Petr Sklenář Michal Dohnal Michal Dohnal (Gar.)	KZ	5	4C	Z	S1
142PZ02	Project Design 2 Martin Králík Martin Králík Martin Králík (Gar.)	KZ	5	4C	Z	S1
143PZ02	Project Design 2  Michal Sněhota, Tomáš Dostál, Martin Dočkal, Martin Šanda, Petr Kavka,  Miroslav Bauer, Martina Sobotková, Adam Vokurka, Pavla Schwarzová,  Miroslav Bauer Martin Dočkal (Gar.)	KZ	5	4C	Z	S1
144PZ02	Project Design 2 Karel Kříž Karel Kříž Karel Kříž (Gar.)	KZ	5	4C	Z	S1
154PZ02	Project Design 2 Martin Štroner Martin Štroner (Gar.)	KZ	5	4C	Z	S1
155PZ02	Project Design 2	KZ	5	4C	Z	S1
220PZ02	Project Design 2  Jiří Svoboda, Radek Vašíček Radek Vašíček (Gar.)	KZ	5	4C	Z	S1

Characteristics of the courses of this group of Study Plan: Code=BZ202007\_1 Name=Stavební inženýrství, specializace Inženýrství životního prostředí, projekt, 7. semestr

101PZ02	Project Design 2	KZ	5
Please, contact the gua	rantor of this subject.		

	Project Design 2	KZ	5
25PZ02	Project Design 2 the field of building services systems. Students choose out of the topics on offer and work on the text, calculations and gra	1	-
rom environment project in		apriicai iorni oi ine pro	ljeci. Sludenis
27PZ02	Project Design 2	KZ	5
-	୍ୱା ୮୮୦)ect Design 2 which is taught in the form of individual consultations. Teaching is provided by Ing. arch. František Pospíšil, Ph.D. and Ing. ar		5
		KZ	5
33PZ02	Project Design 2	1	-
•	I on concrete and masonry structures and materials in relation with the impact on the environment, aspects of sustainable on the content of the work can be the elaboration of a research study comprising the processing of discoveries from the lite		
experiments, etc.	2. The content of the work can be the elaboration of a research study comprising the processing of discoveries from the life	rature, the execution	and analysis o
35PZ02	Project Design 2	KZ	5
36PZ02	Project Design 2	KZ	5
37PZ02	Project Design 2	KZ	5
	FTOJECT DESIGN 2  aplete noise study of the selected area, containing a significant share of rail traffic. Elaboration of a study including an asses	1	-
•	oposal for a solution to the given situation. Application of knowledge of the relevant legislation, methodological guidelines fo		
	e intended for determining the noise load.	n and dalidadan on the	
41PZ02	Project Design 2	KZ	5
-	ntensify the cooperation between the student and the department. During the project students use the acquired knowledge	1	_
	natural disciplines. It is supervised by the staff of the department, preferably directly by the supervisor of the bachelor thesis		٠.
	ogy, work is offered in the areas of watercourse revitalization, river hydraulics, small catchment hydrology, subsurface hydro		
nydraulics and mydro Ind hydraulic transpo		ology, urbanized calcri	ment hydrolog
42PZ02	Project Design 2	KZ	5
	Floject Design 2 d as a project before the thesis. Students will work with their thesis advisors on their thesis topic. The aim is to improve the	1 1	_
_	ope (variant solutions) for subsequent elaboration in the bachelor thesis. Depending on the interest and capacity, the studen		
	ent, which is expected to be continued in the bachelor thesis.	ni chooses a project i	opic irom tric
43PZ02	Project Design 2	KZ	5
	re-diploma (bachelor) thesis project. Students therefore will train independent work in direction of their final thesis. The aim		-
	final thesis, to show them how to properly work with data, how to practically process them, and how to conclude and discus		daeme for the
44PZ02	Project Design 2	KZ	5
	llection and processing for a given site, design of scenarios of foul water drainage and storm water drainage or infiltration. V		-
			•
ongitudinal profile.	Data collection, determination of the way of water supply. Design of feeding pipelines, water storage and main distribution t		
	Data collection, determination of the way of water supply. Design of feeding pipelines, water storage and main distribution p		situation and
54PZ02		KZ	
	Project Design 2  nent and computational preparation for solving the bachelor thesis according to the topic.	KZ	5
heoretical, measurer	Project Design 2 nent and computational preparation for solving the bachelor thesis according to the topic.	1	5
heoretical, measurer	Project Design 2	KZ KZ	
heoretical, measured 55PZ02 Processing of the proj	Project Design 2 nent and computational preparation for solving the bachelor thesis according to the topic.  Project Design 2 ect according to the assignment	KZ	5
Theoretical, measured 55PZ02 Processing of the prop 220PZ02	Project Design 2 nent and computational preparation for solving the bachelor thesis according to the topic.  Project Design 2	KZ KZ	5 5 5

Code of the group: BZ202008\_1

solution takes place after an individual agreement with the supervisor of particular topic.

Name of the group: Stavební inženýrství, specializace Inženýrství životního prostředí, 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	ρ:					
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
143BAPZ	Bachelor Thesis Michal Sněhota, Tomáš Dostál, Martin Dočkal, Martin Šanda, Petr Kavka, Martina Sobotková, Adam Vokurka, Pavla Schwarzová, Jana Valentová, Martin Šanda Tomáš Dostál (Gar.)	Z	12	10C	L,Z	S1
101BAPZ	Bachelor Thesis Jozef Bobok Jozef Bobok Jozef Bobok (Gar.)	Z	12	10C	L,Z	S1
127BAPZ	Bachelor Thesis Jiří Kupka	Z	12	10C	L,Z	S1
133BAPZ	Bachelor Thesis	Z	12	10C	L,Z	S1
135BAPZ	Bachelor Thesis  Jan Pruška	Z	12	10C	L,Z	S1
136BAPZ	Bachelor Thesis Michal Uhlík	Z	12	10C	L,Z	S1
137BAPZ	Bachelor Thesis Lenka Lomoz Lenka Lomoz (Gar.)	Z	12	10C	L,Z	S1
141BAPZ	Bachelor Thesis Michal Dohnal	Z	12	10C	L,Z	S1

142BAPZ	Bachelor Thesis Petr Nowak, Pavel Fošumpaur, Ladislav Satrapa, Martin Horský, Petra Nešvarová Chvojková, Jitka Kučerová, Tomáš Dally, Michal Toman, Miroslav Brouček, Miroslav Brouček	Z	12	10C	L,Z	S1
144BAPZ	Bachelor Thesis Iva Čiháková Bronislava Rohanová Jana Nábělková (Gar.)	Z	12	10C	L,Z	S1
154BAPZ	Bachelor Thesis Martin Štroner Martin Štroner (Gar.)	Z	12	10C	L,Z	S1
155BAPZ	Bachelor Thesis Jindřich Hodač	Z	12	10C	L,Z	S1
220BAPZ	Bachelor Thesis Radek Vašíček	Z	12	10C	L,Z	S1

Characteristics of the courses of this group of Study Plan: Code=BZ202008\_1 Name=Stavební inženýrství, specializace Inženýrství životního prostředí, bakalářská práce

143BAPZ	tředí, bakalářská práce		
143DALZ	Bachelor Thesis	Z	12
	nelor study usually is a continuation of study and pre-diploma seminar. Student selects the topic from offer given by selected	department. In close of	cooperation with
responsible superv	isor, student works on chosen topic.		
101BAPZ	Bachelor Thesis	Z	12
Please contact you	r teacher or guarantor of this subject.		
127BAPZ	Bachelor Thesis	Z	12
The first qualification	on thesis - an independent professional work of the student, of a larger scope - completing the bachelor's degree of study. The	ne defence of the bach	elor thesis is on
of the components	of the state final examination.		
133BAPZ	Bachelor Thesis	Z	12
A bachelor thesis is	s the qualification thesis of a bachelor's degree. It can take the form of a research study on the topic of concrete or masonry	structures and their re	lations on
environmental issu	es or a variant comparative analysis or parametric study or performing and analysing experiments, etc.		
135BAPZ	Bachelor Thesis	Z	12
The bachelor thesis	s concludes the bachelor studies. The student demonstrates that he/she can apply the knowledge acquired during the study c	on a specific project. Th	e bachelor thes
is related to selecte	ed subjects of the study plan. For students of Z.		
136BAPZ	Bachelor Thesis	Z	12
The assigned topic	of bachelor theses can be a project, traffic surveys, research of selected issues with application in practice for various technica	al solutions of road struc	ı ctures, laborator
tests to verify the fu	unctionality of various materials for pavements, etc. In terms of design, the most common topics of theses are, for example,	the design of a new co	nstruction or
•	selected section of a road (bypass, flyover), the design of a road network in a selected area of the city, the design of a new	•	
	esign of an airport, heliport, etc. In terms of pavement structures and road construction technologies, the most frequent topic		
	solutions for asphalt or concrete pavements, including the relevant composite materials or input components (binders, aggreg		p.o, copaco
		ates etc.) assessmen	t of the behavior
		ates, etc.), assessmen	t of the behaviou
	erial or type of structure by laboratory methods, or carrying out simulations, etc.		
137BAPZ	erial or type of structure by laboratory methods, or carrying out simulations, etc.  Bachelor Thesis	Z	12
137BAPZ A bachelor's thesis	erial or type of structure by laboratory methods, or carrying out simulations, etc.  Bachelor Thesis is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are:	Z work with professiona	12 I literature,
137BAPZ A bachelor's thesis processing of profe	Bachelor Thesis is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are: ssional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railway).	Z work with professiona ay line, study of new lir	12 I literature,
137BAPZ A bachelor's thesis processing of profe (processing an over	Prial or type of structure by laboratory methods, or carrying out simulations, etc.    Bachelor Thesis     is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are assional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railway rview of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified laboratory)	Z work with professiona ay line, study of new lir poratory tests).	12 I literature, nes), research
137BAPZ A bachelor's thesis processing of profe (processing an over 141BAPZ	erial or type of structure by laboratory methods, or carrying out simulations, etc.    Bachelor Thesis     is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are: ssional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railway rview of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified lab     Bachelor Thesis	Z work with professiona ay line, study of new lire poratory tests).	12 I literature, nes), research
137BAPZ A bachelor's thesis processing of profe (processing an over 141BAPZ Working on a bach	Bachelor Thesis is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are: ssional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railwarview of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified lab Bachelor Thesis elor thesis in the field of hydraulics, hydrology, water courses or flood protection design. The thesis has the character of a st	Z work with professiona ay line, study of new lir oratory tests).  Z udy, in the case of study	12 I literature, nes), research 12 dents who are
137BAPZ A bachelor's thesis processing of profe (processing an over 141BAPZ) Working on a bach expected to continuous	Bachelor Thesis is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are: issional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railwarview of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified laber and the field of hydraulics, hydrology, water courses or flood protection design. The thesis has the character of a state in the follow-up master's studies, it is assumed that the thesis includes, among other things, a detailed analysis of the pro-	Z work with professiona ay line, study of new lir boratory tests).  Z udy, in the case of stud blems for the follow-up	12 I literature, nes), research 12 dents who are p master's thesis
137BAPZ A bachelor's thesis processing of profe (processing an over 141BAPZ Working on a bach expected to continut 142BAPZ	erial or type of structure by laboratory methods, or carrying out simulations, etc.    Bachelor Thesis     is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are:   issional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railworkiew of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified laber     Bachelor Thesis     Bachelor thesis in the field of hydraulics, hydrology, water courses or flood protection design. The thesis has the character of a state in the follow-up master's studies, it is assumed that the thesis includes, among other things, a detailed analysis of the pro-	Z work with professiona ay line, study of new lir oratory tests).  Z udy, in the case of study	12 I literature, nes), research 12 dents who are
137BAPZ A bachelor's thesis processing of profe (processing an over 141BAPZ) Working on a bach expected to continute 142BAPZ The course include	erial or type of structure by laboratory methods, or carrying out simulations, etc.    Bachelor Thesis     is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are: ssional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railwarview of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified laber	work with professiona ay line, study of new lir poratory tests).  Z udy, in the case of study blems for the follow-up	12 I literature, nes), research 12 dents who are o master's thesis
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### List of courses of this pass:

Code	Name of the course	Completion	Credits			
100ODPR	Industrial Training (3 weeks)	Z	0			
Professional pra	Professional practice is an important part of academic education in undergraduate degree programmes. The student will gain a basic understanding of duties and professional					
respon	responsibilities. The professional practice evaluates the sum of all knowledge acquired through previous theoretical studies and is a proof of their acquisition.					
101BAPZ	Bachelor Thesis	Z	12			
	Please contact your teacher or guarantor of this subject.					
101KG01	Constructive Geometry	Z,ZK	5			
Projections and p	Projections and projective methods. Axonometry. Oblique projection. Orthogonal axonometry. Displaying prisms, cones, cylinders, pyramids, balls. Simple problems in axonometry.					
Basics of lighting	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
101PZ02	Project Design 2  Please, contact the guarantor of this subject.	KZ	5
102FYI	Physics	Z,ZK	4
This is a basic physic nermodynamics. The fo	cs course for students of the study programmes Civil Engineering; Management and Economics in Construction. The course focuses of following areas are covered in the course: Mechanics of material points (particles) and deformable bodies. Discrete and continuous m material point (particle). Mechanical force fields. Gravitational field. Mechanical vibrations. Material deformation. Elastic waves. Acous Fundamentals of thermodynamics. Heat transfer.	on mechanics odel of matter	and basic Kinemati
104YC2A	English 2	Z,ZK	2
the knowledge of lexis (i.e., ESP - technical	e: 104YC2A Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit and exam The aim of the compulsory Engs and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is a style) and communicative competence within the construction industry. The course also seeks to teach students to read technical lite ten discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a credit and a	on professiona erature and to	al languag be able to
104YC2N	Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 6 10)  German 2	Z.ZK	2
he compulsory course	e - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, use necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature Deutsch im Bauwesen	ınderstanding	profession
104YCA1	English 1 :104Y CA1 Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit The aim of the compulsory English course is	Z to enhance the	1 e knowlede
of lexis and gramma echnical style) and con	ar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on profession mmunicative competence within the construction industry. The course also seeks to teach students to read technical literature and to be o express themselves in writing on issues in their field of study. The end of course requirements are a credit. Literature: Horká Hana, Gic Petra, Nivenová Renata: Professional English for Civil Engineering (Units 1 - 5)	al language (i e able to produ	.e., ESP - ice essen
104YCN1	German 1	Z	1
· · ·	e - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, us necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature	_	-
,	·	e: A.Hanáková	i, J.Dress€
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105SVAI he subject combines to conomics, students wif the lectures on law is the political science p	Deutsch im Bauwesen  Social Sciences and Architecture  the teaching of several social sciences - economics and economic policy, political science and law - with an overview of the developm rill become familiar with basic economic concepts, the essence of economic and social policy and the place of construction in the economic son overview of the institutions of Roman law, an interpretation of the constitution, human rights and selected legal norms, especially part outlines the development of political thought in antiquity and in the period from the Renaissance to the present. Lectures on the horizon provide a comprehensive explanation of the history of architecture from antiquity to postmodernism and deconstruction	Z,ZK nent of archite omic structure. of the new consistory of archi	5 cture. With The conte struction la tecture an
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126STMN	Construction Management	Z,ZK	6
	ed concepts. Methods to support project management. Legal standards, ČSN and ISO standards. The essential aspects of Project M		
	bjectives, strategies, phases and surroundings of the construction project. Project manager role. Purchases and contracts in the project in t		
	Financial management and project evaluation. Feasibility study. Cost and resource management. Change procedures. The Act on Spanish the Augustian of Public Contracts, and the definition of towards the Augustian relationships the conductor of contracts the	•	•
_	Act on the Awarding of Public Contracts, and the definition of terms. Business obligation relationships, the conclusion of contracts, the substitution of contracts, the substitution of contracts and the obligations of participants. Securing the commitment - contractual penalty, guarants.		-
business condition	in construction - are contract for the conclusion of a future contract, purchase contract, contract for work, and content of the cor		iraci types
127BAPZ	Bachelor Thesis	Z	12
	porthesis - an independent professional work of the student, of a larger scope - completing the bachelor's degree of study. The defend		
The mot quamean	of the components of the state final examination.	o or the bachelor to	10313 13 0110
127PZ01	Project Design 1	KZ	5
	e project is tought in cooperation with other departments. Preparation for bachelor thesis, collecting the information, preparation of da		Ü
127PZ02	Project Design 2	KZ	5
	ject course, which is taught in the form of individual consultations. Teaching is provided by Ing. arch. František Pospíšil, Ph.D. and Ing		_
127VEIS	Public Infrastructure	Z,ZK	7
_	The aim of the course is to introduce students to the work of urban planners and spatial planners when designing public infrastructur		•
127YPSK	Town and Regional Planning of Settlements and Landscape	Z.ZK	6
	t in the field of Environmental Engineering is an introduction to urbanism, urban design, spatial and regional planning as a basis for the	. , .	-
_	f Urban Design, Town and Regional Planning. It complements the semester projects with theory and a broader professional context a		
	of the state bachelor's exam organized by the Dep. of Urban Design, Town and Regional Planning.		
132PRPE	Strength of Materials	Z,ZK	6
Fundamentals of the	he theory of elasticity: stress and strain of straight beams subjected to bending and free torsion, ultimate plastic capacity of a membe	r in bending, critica	al loads and
buckling leng	ths of straight compression members. Basic assumptions, quantities, and equations describing the stress and strain state in 3D cont	inuum, 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 force	s. Compound two-	dimensional
	structures. Trusses. Reaction forces applying the principle of virtual work.		
132SM02	Structural Mechanics 2	Z,ZK	6
Internal forces di	agrams of simple statically determinate plane structures and compound two-dimensional structures. Multiaxially loaded cantilever. De	efinition of normal s	tress and
	positions of its distribution in a cross section. Equivalence of internal forces. Geometry of mass and areas, centre of gravity and mom	ents of inertia.	
132SM3	Structural Mechanics 3	Z,ZK	5
Deformation and fo	rce method for the solution of reactions and internal forces on statically indeterminate beams, frames, and truss structures. Calculation	on of displacement	s of beams,
	frames, and truss structures using the principle of virtual works.		
133BAPZ	Bachelor Thesis	Z	12
A bachelor thes	is is the qualification thesis of a bachelor's degree. It can take the form of a research study on the topic of concrete or masonry struc		itions on
400071/7	environmental issues or a variant comparative analysis or parametric study or performing and analysing experiments, etc.		
133BZKZ	Concrete and Masonry Structures s is focused on the design of one-way and two-way slabs, staircases, reinforcing walls, foundations, precast structures, halls and pre	Z,ZK	5 The course
	rry construction and an introduction to the design of civil engineering structures and bridges. The content of the practicum is the app		
also covers maso	skills on the real structures.	ilcation of the know	neuge and
133NNKB	Fundamentals of Structural Design - Concrete	Z,ZK	4
	e subject are the basics of load-bearing concrete structures design and the design methodology according to valid standards, includi		
	perties of concrete, the production and testing of concrete, the properties of concrete reinforcement and its interaction with concrete		
	oncrete structures for basic types of loading (bending, shear, pressure) are the main part of this course. An introduction to serviceabi		
this course. Th	ne course follows the introductory subject of Civil Engineering program (Structural Mechanics, Elasticity and Strength, Building Mater	ials, Building Struc	tures).
133PZ02	Project Design 2	KZ	5
The subject is foc	used on concrete and masonry structures and materials in relation with the impact on the environment, aspects of sustainable const	ruction, energy cor	sumption,
renewable sources	s, etc. The content of the work can be the elaboration of a research study comprising the processing of discoveries from the literature,	, the execution and	analysis of
	experiments, etc.		
134NNKO	Design of Supporting StructuresI - Steel	Z,ZK	3
The basics of desig	ning steel, steel-concrete and wooden load-bearing structures according to applicable standards, including the determination of load	effects, design diffe	erences due
	to the specific properties of individual materials.		
134ODKV	Steel and Timber Structures	Z,ZK	. 5
·	pros and contras, material properties, fabrication, connections, industrial steel buildings, cables, high strength steel, buildings in term	•	•
·	n, utilization. Timber - loadings, material propertie, limit states methodology, design, connections, bracings, protection of structural tin	nber, timber bridge	
135BAPZ	Bachelor Thesis	<u> </u>	12
The bachelor thesis	s concludes the bachelor studies. The student demonstrates that he/she can apply the knowledge acquired during the study on a speci is related to selected subjects of the study plan. For students of Z.	inc project. The bac	rieior triesis
10ECM01	Geomechanics 1	Z	3
135GM01	Geomechanics i s on the understanding of basic geological laws and principles in relation to architecture, civil engineering and urban planning. Empha		
	ical processes, both endogenous and exogenous, on the rock environment and how the geological situation affects the design of struc		-
	ent. At the same time, attention is paid to the technical properties of rocks with regard to their practical applications. The course also i		
	the regional geology of the Czech Republic.		
135GM2I	Geomechanics 2I	Z,ZK	5
	ils, basic properties of soils, water in soil, strength and deformation properties of soils and their determination, improvement of soil p		
135PZ02	Project Design 2	KZ	5
135ZSH	Foundations and Hydrogeology	Z,ZK	7
	n of foundation structures according to Eurocode principles. Types of foundation structures. Building pits. Basic information on the hyc		=
	groundwater chemistry. Aggressive waters. Groundwater tapping.	- <del>-</del>	
136BAPZ	Bachelor Thesis	Z	12
	of bachelor theses can be a project, traffic surveys, research of selected issues with application in practice for various technical solution		
tests to verify the	functionality of various materials for pavements, etc. In terms of design, the most common topics of theses are, for example, the des	sign of a new const	ruction or

reconstruction of a selected section of a road (bypass, flyover), the design of a road network in a selected area of the city, the design of a new construction or reconstruction of intersections, the design of an airport, heliport, etc. In terms of pavement structures and road construction technologies, the most frequent topics of work are, for example, comparison of different material solutions for asphalt or concrete pavements, including the relevant composite materials or input components (binders, aggregates, etc.), assessment of the behaviour of a particular material or type of structure by laboratory methods, or carrying out simulations, etc. 136DSUZ Transport Structures and Urban Planning Z,ZK 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. 136DSZP Transport Structures and Environment The course is designed as an introduction to the problems of the relationship between road and rail transport and the environment. In more detail, it is aimed at the issue of noise and anti-noise measures from the point of view of a civil engineer in the field of rail transport. In the field of road transport, the subject is focused on traffic calming and control, solutions for urban and pedestrian zones, solutions for non-motorized traffic, including material, technological and design solutions. 136PZ02 ΚZ Project Design 2 137BAPZ **Bachelor Thesis** Ζ 12 A bachelor's thesis is the first comprehensive work prepared by students during their university studies on a chosen topic. The basic tasks are: work with professional literature, processing of professional text, citation habits, etc. A bachelor's thesis usually takes the form of a design (reconstruction of a section of a railway line, study of new lines), research (processing an overview of the current state of solutions in a certain area) or laboratory (including the execution and evaluation of specified laboratory tests) 137PZ02 Project Design 2 Development of a complete noise study of the selected area, containing a significant share of rail traffic. Elaboration of a study including an assessment of the noise situation of the area and a possible proposal for a solution to the given situation. Application of knowledge of the relevant legislation, methodological guidelines for the calculation of traffic noise levels and prediction software intended for determining the noise load. **Bachelor Thesis** Working on a bachelor thesis in the field of hydraulics, hydrology, water courses or flood protection design. The thesis has the character of a study, in the case of students who are expected to continue in the follow-up master's studies, it is assumed that the thesis includes, among other things, a detailed analysis of the problems for the follow-up master's thesis 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. 141KMH Climatology, Meteorology, Hydrology The course focuses on the following thematic areas: General circulation of the atmosphere, climate factors and climate zones. Composition and structure of the atmosphere, water in the atmosphere. Air masses and fronts. Cloud development and precipitation. Hydrologic cycle and hydrologic balance. Interception, infiltration, evaporation. Runoff generation, rainfall-runoff relationships, flood routing, discharge measurement. Frequency analysis of extreme events. Hydrologic design. 141PZ01 Project Design 1 The Project Design 1 at the Department of Hydraulics and Hydrology is focused on the modeling of the water component of the environment or the hydrological analysis of a selected catchment. 141PZ02 Project Design 2 5 The project serves to intensify the cooperation between the student and the department. During the project students use the acquired knowledge from hydraulics, hydrology and other related technical and natural disciplines. It is supervised by the staff of the department, preferably directly by the supervisor of the bachelor thesis. In the case of the Department of Hydraulics and Hydrology, work is offered in the areas of watercourse revitalization, river hydraulics, small catchment hydrology, subsurface hydrology, urbanized catchment hydrology and hydraulic transport. 141VTO Water Courses Z,ZK 5 Students meet geomorphic fluvial processes taking place in river channels, expand their knowlege in the field of river hydraulics and river training technology and gain an idea of administration, maintenance and management of rivers in the Czech Republic. In practical part students are requested to prepare a report on assessment of river reach of own choice with aim to identify problems to be solved. Fieldwork Training (1 week) 141VYV1 2 7 Not applicable Z,ZK 141YHMM Hydroecological monitoring and modeling 6 General principles of meteorological measurement, data resources, and measurement design. Meteorological and climatic measurements. Hydrological measurements. Tracers in experimental hydrology. Remote sensing for hydrology and meteorology. Evapotranspiration measurements. Data analysis. Modeling in hydrology. Modeling in ecology and biology. Inverse modeling. 142BAPZ **Bachelor Thesis** Ζ 12 The course includes individual work of the student and consultations related to the work on the bachelor thesis 142PZ01 Project Design 1 ΚZ 5 The project is tought in cooperation with other departments. Preparation for bachelor thesis, collecting the information, preparation of data, state of art. 142PZ02 Project Design 2 ΚZ 5 The course is designed as a project before the thesis. Students will work with their thesis advisors on their thesis topic. The aim is to improve the level of the bachelor thesis and to allow for a broader scope (variant solutions) for subsequent elaboration in the bachelor thesis. Depending on the interest and capacity, the student chooses a project topic from the offer of each department, which is expected to be continued in the bachelor thesis. 142VIZP Z,ZK 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. Final thesis of bachelor study usually is a continuation of study and pre-diploma seminar. Student selects the topic from offer given by selected department. In close cooperation with responsible supervisor, student works on chosen topic.

143GIPU Two parallel block	Dendrology and Landscape Protection sents a synthesis of topics related to applied ecology and at the same time dendrology, focused on practical use in the creation and purely well as within urbanized units.	Z,ZK protection of the la	6
143GIPU Two parallel block	well as within urbanized units.	orotection of the la	ndooono oo
Two parallel block principles of design			nuscape as
Two parallel block principles of design		7.714	
principles of design	GIS and Land Consolidation	Z,ZK	7
	s of instruction - Land consolidation and basics of geomatics (GIS applied for KPÚ). Basics of land consolidation - history, course and pring common facilities, legislation. Introduction to GIS and main components of common systems. Data structure and basics of imag	-	
geographically loc	alized data. Basics of databases and work with vector and raster formats of geographic data. GIS in engineering practice and landsca	•	٠ ا
	a digital terrain model, land use maps and other inputs and available databases in the Czech Republic. Processing of remote sens		cparation of
1430DKO	Waste Management and Contamination	Z.ZK	6
	r and circular economy with a focus on construction and municipal waste. Waste collection, utilization and disposal systems (municipal	,	-
	gas, landfill technology and post-closure reclamation. Measurement of waste production, biowaste management-composting and ana		
oodaniy, ianami s	waste in the Czech Republic. Remediation of pollution - remediation methods to decontaminate the territory.	o.oz.o a.goo.o	
143PED	Soil Science	Z,ZK	5
	ironment. Soil genesis, pedogenetic factors. Soil structure and texture. Physical and physiochemical soil properties. Physical, chemica		
	cation. Soil survey and mapping. Soils of the world. Clay minerals, soil chemistry. Hydrostatic and hydrodynamic behaviour of soil water		
	soil moisture. Flow of water in variably saturated porous media.	, ,	
143PZ01	Project Design 1	KZ	5
	ork on a study of the construction of a small water reservoir and on the revitalization of a small water courses under the reservoir. The	1	
	computational and drawing part.	,	,
143PZ02	Project Design 2	KZ	5
	act pre-diploma (bachelor) thesis project. Students therefore will train independent work in direction of their final thesis. The aim there	1	
•	ndependent work on final thesis, to show them how to properly work with data, how to practically process them, and how to conclude		
143TOKT	Landscape Design and Protection	Z,ZK	7
143YPEO	Erosion Protection	Z,ZK	6
	soil erosion process, its risks and negative effects. Basic principles of catchment management. Negative effects of soil erosion on inc	1 '	
	eiety. Methods of soil loss and sediment transport determination, design of soil erosion control measures. State tools and policies in so		.accape a.ia
144BAPZ	Bachelor Thesis	Z	12
1440/11/2	Bachelor Thesis concerning sewerage, waste water treatment, water suply, networks and balnology.	_	1 12
144PZ02	Project Design 2	KZ	5
-	ata collection and processing for a given site, design of scenarios of foul water drainage and storm water drainage or infiltration. WATI		
	site. Data collection, determination of the way of water supply. Design of feeding pipelines, water storage and main distribution pipeli		
cappi, craigiron	longitudinal profile.		
144VHOB	Urban water management	7 7K	
144VHOB Hydrochemistry: C	Urban water management Themical composition of water. Dissolved and particular matters, Metals, halogens, Nitrogen, sulphur and phosphorous compounds. No	Z,ZK	6
Hydrochemistry: C	Urban water management Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. No Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste waters.	on-electrolytes. Org	6 ganic matter.
Hydrochemistry: C Self-purification.	themical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. No	on-electrolytes. Org ers. Water distribut	6 ganic matter. ion system:
Hydrochemistry: C Self-purification. E Water sources. Sy	themical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. No Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water	on-electrolytes. Orgers. Water distribute networks. Sewer	6 ganic matter. ion system: age objects.
Hydrochemistry: C Self-purification. E Water sources. Sy	chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. No Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage	on-electrolytes. Orgers. Water distribute networks. Sewer	6 ganic matter. ion system: age objects.
Hydrochemistry: C Self-purification. E Water sources. Sy	Themical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Not Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. n	on-electrolytes. Orgers. Water distribute networks. Sewer	6 ganic matter. ion system: age objects.
Hydrochemistry: C Self-purification. E Water sources. Sy Combined sewer of	chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge	on-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin	6 ganic matter. ion system: age objects. g. Biological
Hydrochemistry: C Self-purification. E Water sources. Sy Combined sewer of	Themical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. natreatment. Removal of nitrogen and phosphorus. Sludge  Bachelor Thesis	on-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin	6 ganic matter. ion system: age objects. g. Biological
Hydrochemistry: C Self-purification. E Water sources. Sy Combined sewer of	Themical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. natreatment. Removal of nitrogen and phosphorus. Sludge  Bachelor Thesis  Final thesis, prepared according to the assignment.	on-electrolytes. Orgers. Water distribute networks. Seweranechanical cleanin	6 ganic matter. ion system: age objects. g. Biological
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note a cutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge  Bachelor Thesis Final thesis, prepared according to the assignment.  Project Design 2 Theoretical, measurement and computational preparation for solving the bachelor thesis according to the topic.	on-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin	6 ganic matter. ion system: age objects. g. Biological
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02 154SG01	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. nature treatment. Removal of nitrogen and phosphorus. Sludge  Bachelor Thesis  Final thesis, prepared according to the assignment.  Project Design 2	on-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin	6 ganic matter. ion system: age objects. g. Biological
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02 154SG01 The shape and s	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge  Bachelor Thesis Final thesis, prepared according to the assignment.  Project Design 2 Theoretical, measurement and computational preparation for solving the bachelor thesis according to the topic.  Land Surveying in Civil Engineering	on-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin	6 ganic matter. ion system: age objects. g. Biological 12 5
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02 154SG01 The shape and s build-up Angle ar	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note a cutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge  Bachelor Thesis Final thesis, prepared according to the assignment.  Project Design 2  Theoretical, measurement and computational preparation for solving the bachelor thesis according to the topic.  Land Surveying in Civil Engineering size of the Earth, substitutive surfaces, cartographic projections Horizontal and vertical control, coordinate calculations Quality control	ph-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin  Z  KZ  Z,ZK , deviations and to r scanning Themat	6 ganic matter. ion system: age objects. g. Biological 12 5 6 lerations in ic mapping
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02 154SG01 The shape and s build-up Angle ar	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge  Bachelor Thesis Final thesis, prepared according to the assignment.  Project Design 2  Theoretical, measurement and computational preparation for solving the bachelor thesis according to the topic.  Land Surveying in Civil Engineering size of the Earth, substitutive surfaces, cartographic projections Horizontal and vertical control, coordinate calculations Quality control and distance measurements Heighting measurements Other geodetic methods in build-up (GNSS, DPZ,) Photogrammetry and laser	ph-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin  Z  KZ  Z,ZK , deviations and to r scanning Themat	6 ganic matter. ion system: age objects. g. Biological 12 5 6 lerations in ic mapping
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02 154SG01 The shape and s build-up Angle ar	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge    Bachelor Thesis	ph-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin  Z  KZ  Z,ZK , deviations and to r scanning Themat	6 ganic matter. ion system: age objects. g. Biological 12 5 6 lerations in ic mapping
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02 154SG01 The shape and s build-up Angle ar and present state	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge    Bachelor Thesis	on-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin  Z  KZ  Z,ZK , deviations and to r scanning Themat and spatial plannin	6 ganic matter. ion system: age objects. g. Biological 12 5 6 lerations in ic mapping g Cadastre
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02 154SG01 The shape and s build-up Angle ar and present state	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge    Bachelor Thesis	on-electrolytes. Orgers. Water distribute networks. Sewernechanical cleanin  Z  KZ  Z,ZK , deviations and to r scanning Themat and spatial plannin	6 ganic matter. ion system: age objects. g. Biological 12 5 6 lerations in ic mapping g Cadastre
Hydrochemistry: C Self-purification. B Water sources. Sy Combined sewer of 154BAPZ 154PZ02 154SG01 The shape and s build-up Angle ar and present state	Chemical composition of water. Dissolved and particular matters. Metals, halogens. Nitrogen, sulphur and phosphorous compounds. Note Eutrophication. Hydrobiology: Types of natural waters. Ecology of aquatic organisms. Hydrobiology of surface, drinking and waste water stems of water purification. Water distribution system Sewer system: Wastewater. Shapes and sizes of the sewers. Types of sewerage overflows. Environmental protection Waste water treatment plant: domestic wastewater treatment plant. Wastewater treatment plant. In treatment. Removal of nitrogen and phosphorus. Sludge    Bachelor Thesis	on-electrolytes. Orgers. Water distribute networks. Seweranechanical cleaning Z  KZ  Z,ZK , deviations and to r scanning Thematand spatial planning Z	6 ganic matter. ion system: age objects. g. Biological  12  5  6 lerations in ic mapping g Cadastre  12
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