Study plan

Name of study plan: Architektura a stavitelství

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Architecture and Building Sciences
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 2019/20 do 2022/23

Name of the block: Compulsory courses
Minimal number of credits of the block: 187
The role of the block: Z

Code of the group: BA20150100
Name of the group: Architektura a stavitelství, 1. 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
101M1A	**Mathematics 1A** *Ivana Pultarová, Jan Lamač, Michal Zdražil, Zdeněk Skalák, Milan Bořík, Michal Beneš, Petr Kučera, Monika Rencová, Martin Soukenka, ... **Zdeněk Skalák** Zdeněk Skalák (Gar.)*	Z,ZK	6	2P+2C	Z,L	z
123SHMA	**Building Materials** *Alena Vimmrová, Miloš Jerman, Eva Vejmelková **Alena Vimmrová** Alena Vimmrová (Gar.)*	Z,ZK	3	2P+1C	Z	z
124PSA1	**Buildings 1** *Petr Hájek, Jan Růžička, Magdaléna Novotná, Veronika Kačmaříková **Petr Hájek** Petr Hájek (Gar.)*	Z,ZK	5	2P+2C	Z	z
129AAKO	**Architectural composition studio** *Ladislav Podracký, Vojtěch Vodička, Nikola Puchelová, Klára Škodová, Petr Aster, Kamila Housová Mizerová, Richard Bartík, Libor Fránek, Helena Hexnerová, ... **Zuzana Pešková** Jaroslav Daďa (Gar.)*	KZ	4	3C	Z	z
129GPA	**Graphic Presentation of Architecture** *Nikola Puchelová, Petr Aster, Kamila Housová Mizerová, Helena Hexnerová, Vojtěch Dvořák, Jan Kašpar, Zuzana Pešková, Vít Jurica, Eva Antošová, ... **Zuzana Pešková** Zuzana Pešková (Gar.)*	KZ	5	5C	Z	z
129UNA	**Introduction to professional practise** *Václav Dvořák, Petra Novotná, Jaroslav Daďa, Radek Zykan, Petr Lédl, Luboš Knytl, Michal Šourek, Petr Šikola **Petr Šikola** Luboš Knytl (Gar.)*	ZK	5	4P	Z	z

Characteristics of the courses of this group of Study Plan: Code=BA20150100 Name=Architektura a stavitelství, 1. semestr

101M1A	Mathematics 1A	Z,ZK	6
https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/MT01/			
123SHMA	Building Materials	Z,ZK	3
Building materials - basic course. Clasification of the materials. Structure of materials. Main properties of materials. Application of materials in building constructions. Introduction to material testing.			
124PSA1	Buildings 1	Z,ZK	5
The concept of design of building structures with a comprehensive consideration of the functional requirements imposed on individual elements. Requirements for building structures, structural system, interaction of elements, spatial effect of the structural system. Vertical load-bearing structures (functions, requirements, principles of the structural design of walls, columns), floor structures (functions, requirements, principles of the structural design of vaults, wooden ceilings, reinforced concrete ceilings, ceramic concrete ceilings, steel and steel concrete ceilings). Expansion joints in load-bearing systems. Structural systems of single and multi-storey buildings, structural systems of long-span structures.			
129AAKO	Architectural composition studio	KZ	4
Students learn to apply knowledge acquired in the subject Introduction to Architecture Design to simple abstract tasks. Principles of Form and Space Composition. Idea and form of abstract surface and spatial composition. The physical model as a form of verification of compositional intentions.			

129GPA	Graphic Presentation of Architecture	KZ	5

The GPA course is divided into 2 parallel and complementary parts. One part is devoted to pictorial representation and consists of three lessons per week. Students will learn the basics of architectural drawing and methods of representation - drawing objects in orthogonal, isometric and perspective form, drawing offset figures, drawing greenery and basic geometric solids.The second part is devoted to mastering the basic tools of computer imaging and is subsidised for 2 hours. Students will learn how to make a vector sketch, create a simple 3D model of an object, use post-production to present the object, and assemble the resulting poster from the output of various computer programs. The course therefore has a total of 5 hours of direct teaching per week and is worth 5 credits, which means that a student should spend 125 hours on the course in one semester (75 hours on drawing + 50 hours on computer graphics), direct teaching takes 65 hours (39 hours on drawing + 26 hours on computer graphics), i.e. for self-study and independent work a student should have 60 hours (36 hours on drawing + 24 hours on computer graphics).

129UNA	Introduction to professional practise	ZK	5

The lectures are divided into two tracks. The first is devoted to architectural composition, the basics of understanding the use of compositional principles in architectural design and understanding their effects. It also deals with other key means of architecture, such as structure, color, and material. All the attributes illuminated are presented in their basic, pure form and are further demonstrated on existing buildings of historical, but especially contemporary architecture. The second section is devoted to the problems of the basic principles of space creation in terms of layout requirements, ergonomics, quality of space creation. It is an introduction to the later more specialized subjects of building science. All the principles are presented with examples of mainly contemporary architectural design.

Code of the group: BA20150200
Name of the group: Architektura a stavitelství, 2. semestr
Requirement credits in the group: In this group you have to gain at least 27 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 27
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
101KGA1	**Constructive Geometry A** *Michal Zdražil, Petra Vacková, Iva Slámová, Iva Malechová, Jozef Bobok, Hana Lakomá, Iva Křivková* ***Hana Lakomá*** *Iva Malechová (Gar.)*	Z,ZK	5	2P+2C	L,Z	z
101M2A	**Mathematics 2A** *Ivana Pultarová, Jan Lamač, Zdeněk Skalák, Milan Bořík, Michal Beneš, Monika Rencová, Martin Soukenka, Yuliya Namlyeyeva, Iva Slámová, ...* ***Petr Kučera*** *Petr Kučera (Gar.)*	Z,ZK	4	2P+2C	L,Z	z
124PSA2	**Buildings 2** *Magdaléna Novotná, Zuzana Rácová, Veronika Kačmaříková, Jiří Pazderka* ***Jiří Pazderka*** *Jiří Pazderka (Gar.)*	Z,ZK	5	2P+2C	L	z
129AKR	**Architectural drawing** *Kamila Housová Mizerová, Jan Kašpar, Zuzana Pešková, Eva Antošová, Radek Macke, Ivo Chvojka, Ctibor Havelka, Vratislav Ševčík, Dalibor Smutný, ...* ***Zuzana Pešková*** *Zuzana Pešková (Gar.)*	KZ	4	3C	L	z
129ATZ1	**Introductory design studio 1** *Ladislav Podracký, Vojtěch Vodička, Petr Aster, Martin Šnorbert, Richard Bartík, Helena Hexnerová, Hana Bořík ová, Jolana Zdobinská, Tomáš Čunderlík, ...* ***Jana Hořická*** *Jana Hořická (Gar.)*	KZ	4	4C	L	z
132SMA1	**Structural Mechanics 1A** *Jiří Němeček, Aleš Jíra, Kristian D'Amico, Petr Bočan, Tomáš Janda, Karel Pohl, Tomáš Plachý* ***Aleš Jíra*** *Aleš Jíra (Gar.)*	Z,ZK	5	2P+2C	L,Z	z

Characteristics of the courses of this group of Study Plan: Code=BA20150200 Name=Architektura a stavitelství, 2. semestr

101KGA1	Constructive Geometry A	Z,ZK	5

Projections and projective methods. Axonometry. Oblique projection. Orthogonal axonometry. Displaying prisms, cones, cylinders, pyramids, balls. Simple problems in axonometry. Basics of lighting of solids and groupes of solids. Perspective projection. Photogrammetry. Curves, parametrisation. Helical surfaces. Quadrics. Hyperbolic paraboloid, conoids and cylindroids. Next surfaces in building industry.

101M2A	Mathematics 2A	Z,ZK	4

https://mat.fsv.cvut.cz/vyuka/bakalari/eng/ls/MT02/

124PSA2	Buildings 2	Z,ZK	5

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.

129AKR	Architectural drawing	KZ	4

In architectural drawing courses, students learn to correctly perceive and "see" shapes and masses in their proportional relationships, spatial context, scale and visual perspective. Models are first assemblies of geometric solids, then supplemented with draperies and other objects. The listener learns to lay out and optimally place the drawing in the format and to use view, horizon and runs to build the final composition. Ongoing instruction aids in pencil progression while profiling personal handwriting. The goal is to develop spatial vision and gain skills in drawing and sketching, which is indispensable as a means of communication in architectural design. Consistent attention is paid to aspects of shape and mass in space, the expression of light and shadow, plasticity, structure and differentiation of materials.

129ATZ1	Introductory design studio 1	KZ	4

The Studio is the student's first experience of designing a specific building on a specific site. This course follows architectural composition course, which focuses on architectural design as an abstract composition of smaller parts in relation to a larger whole. The core of the course is the architectural design process applied to the design of a simple building. The main goal of the course in general is the mastery of architectural design techniques along with the further development of creativity initiated in architectural composition. The specific aim of the work is to design a small building - an operationally simple object in the context of specified conditions.

132SMA1	Structural Mechanics 1A	Z,ZK	5

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. 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.

Code of the group: BA20150300
Name of the group: Architektura a stavitelství, 3. semestr
Requirement credits in the group: In this group you have to gain at least 28 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 28
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
101M3A	**Mathematics 3A** *Ivana Pultarová, Jan Lamač, Zdeněk Skalák, Milan Bořík, Michal Beneš, Monika Rencová, Martin Soukenka, Iva Malechová, Jozef Bobok, ... **Jozef Bobok** Jozef Bobok (Gar.)*	Z,ZK	4	1P+2C	Z	z
124SFA	**Building Physics 1A** *Jaroslav Vychytil, Zbyněk Svoboda, Lenka Maierová, Pavel Kopecký **Jaroslav Vychytil** Jaroslav Vychytil (Gar.)*	Z,ZK	7	4P+3C	Z	z
125TBA1	**Building Services Systems 1** *Karel Kabele, Stanislav Frolík **Karel Kabele** Karel Kabele (Gar.)*	Z,ZK	4	2P+2C	Z	z
129ATZ2	**Introductory design studio 2** *Richard Bartík, Libor Fránek, Jana Hořická, Vojtěch Dvořák, Jan Kašpar, Petra Novotná, Jiří Trojan, Štěpán Lajda, Jiří Pošmourný, ... **Jana Hořická** Jana Hořická (Gar.)*	KZ	6	4C	Z	z
129NB01	**Architectural typology 1** *Tomáš Čunderlík, Jana Hořická, Petra Novotná, Pavel Filsak, Radek Zykan, Petr Lédl, Luboš Knytl **Luboš Knytl** Luboš Knytl (Gar.)*	Z,ZK	3	1P+2C	Z	z
132PRA	**Strength of Materials A** *Tomáš Plachý, Vít Šmilauer, Eva Novotná, Zdeněk Prošek **Vít Šmilauer** Vít Šmilauer (Gar.)*	Z,ZK	4	1P+2C	Z,L	z

Characteristics of the courses of this group of Study Plan: Code=BA20150300 Name=Architektura a stavitelství, 3. semestr

101M3A	Mathematics 3A	Z,ZK	4
https://mat.fsv.cvut.cz/vyuka/bakalari/M3A			
124SFA	Building Physics 1A	Z,ZK	7
Heat transfer, Fourier laws, thermal resistance, thermal transmittance, mean thermal transmittance, energy performance of buildings, energy need for heating, energy use, primary energy, diffusion and condensation of water vapor, internal surface temperature, risk of mould growth, thermal bridges and joints. Solar radiation and its importance. Determining the position of the Sun in the sky using numerical and graphical methods. Insolation. Meaning of terms, requirements. Daylighting. Criteria and limits. Lighting systems. The principle of determining the daylight factor by calculation and measurement. Parts of the daylight factor. Qualitative aspect of daylighting (uniformity, direction of light incidence, etc.). Concepts of sound and noise. Criteria and limits. Acoustic quantities, symbols and calculation. Sound propagation outdoors and indoors. Sound attenuation due to aperture. Direct and diffuse sound field. Reverberation time and reverberation radius. Sound absorbing structures. Structural acoustics. Sound insulation. Sound reduction index. Impact noise. Indirect transmission.			
125TBA1	Building Services Systems 1	Z,ZK	4
Basic course in building services systems - water supply, drainage, gas supply and heating systems.			
129ATZ2	Introductory design studio 2	KZ	6
The studio follows previous course of Introductory design studio 1. The main focus of the course is to extend the application of the architectural design process to include typological and ergonomic issues. The main aim of the general teaching is, along with the further development of creativity, the mastery of architectural design procedures, the acquisition of work habits and the layout of design work applied to small-scale assignments. The specific aim of the work is the design of a small building, typologically specified, with a housing element.			
129NB01	Architectural typology 1	Z,ZK	3
The topics are focused on the basic typology of buildings for housing, accommodation and public catering.			
132PRA	Strength of Materials A	Z,ZK	4
The subject deals with basic elastoplastic analysis of cross-sections and structures. Uniaxial stress - effect of temperature, statically indeterminate cases, truss deformation, stress distribution. Bending of a beam - simple and combined bending, combination with axial force, tension, core of the cross-section. Ideally elastoplastic material model for uniaxial tension, plastic limit state of cross-sections and structures. Beam stability, perfect and imperfect beam. Plane stress - stress transformation, principal stress, Mohr's circle, principal stress. Shear stress - bending shear. Torsion of circular, massive, thin-walled cross-sections.			

Code of the group: BA20150400
Name of the group: Architektura a stavitelství, 4. semestr
Requirement credits in the group: In this group you have to gain at least 30 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
124PSA3	**Buildings A3** *Lenka Hanzalová, Vladimír Žďára **Vladimír Žďára** Vladimír Žďára (Gar.)*	Z,ZK	6	3P+2C	L	z
125TB2	**Building Services Systems 2** *Daniel Adamovský, Bohumír Garlík **Daniel Adamovský** Daniel Adamovský (Gar.)*	Z,ZK	4	2P+2C	L	z

129AT01	**Design studio 1** *Richard Bartík, Libor Fránek, Helena Hexnerová, Jolana Zdobinská, Jan Kašpar, Běla Menčlová, Ladislav Tichý, Petra Novotná, Pavel Filsak, ...* ***Petr Lédl*** *Petr Lédl (Gar.)*	KZ	6	6C	Z	z
129NB02	**Architectural typology 2** *Helena Hexnerová, Tomáš Čunderlík, Běla Menčlová, Petra Novotná, Pavel Filsak, Radek Zykan, Petr Lédl, Luboš Knytl, Eva Kosíková, ...* ***Ladislav Kalivoda*** *Luboš Knytl (Gar.)*	Z,ZK	5	2P+2C	L	z
132SMA2	**Structural Mechanics 2A** *Jiří Němeček, Aleš Jíra, Tomáš Janda, Eva Novotná, Barbora Hálková, Jiří Němeček, Dagmar Jandeková* ***Aleš Jíra*** *Jiří Němeček (Gar.)*	Z,ZK	4	1P+2C	Z,L	z
154SGEA	**Land Surveying** *Martin Tauchman, Tomáš Křemen, Karel Pavelka, Jiří Cajthaml, Tomáš Janata* ***Tomáš Křemen*** *Martin Štroner (Gar.)*	Z,ZK	5	2P+2C	L	z

Characteristics of the courses of this group of Study Plan: Code=BA20150400 Name=Architektura a stavitelství, 4. semestr

124PSA3	Buildings A3	Z,ZK	6

The subject has two parts. In the first part, the subject deals with the comprehensive design of supporting structures of roofing, indoor and multi-storey buildings and the structural-static effect of the perimeter and roof sheathing. The second part of the course deals with the design of packaging and dividing structures. The construction of flat and pitched roofs, the construction of external envelopes, the construction of opening fillings and light external envelopes, and the construction of partitions, views and floors are discussed."

125TB2	Building Services Systems 2	Z,ZK	4

This subject includes an introduction to ventilation and air conditioning in buildings and solutions for electric instalations and artificial lighting.

129AT01	Design studio 1	KZ	6

Studio creation is an application subject in which students apply the knowledge gained from a wide range of architectural disciplines with their own artistic opinion and creativity. The theme of the studio is the design of an apartment building of tangible size, with an emphasis on the idea, the concept of the solution, the relationship of the designed object to the surroundings, the object's own spatial structure, layout solution, structural feasibility. It is essential to find a modern artistic and aesthetic expression in the context of the place and the surrounding buildings. Understanding of basic spatial relationships in the design phase of the project using the elementary tools of architectural creation.

129NB02	Architectural typology 2	Z,ZK	5

The lectures are devoted to the issue of selected types of civil buildings, especially buildings for healthcare, education, and transport. The lectures focus on operational ties, operational circuits within structures, specific requirements from various points of view - from social to, for example, hygienic. They also note the urban context, technological requirements and construction specifics, typical for the respective range of buildings. The exercises follow the lectures.

132SMA2	Structural Mechanics 2A	Z,ZK	4

The subject deals with the basic elastic analysis of statically indeterminate structures. The first part introduces the energy of deformation, the principle of virtual forces, deformation on statically determined structures. Maxwell and Betti's theorem. Force method and its application to statically indeterminate lattice structures, continuous beams, frames, closed frames. Symmetrical structures with symmetrical and antisymmetric loading. Effect of temperature effects and prescribed displacements of supports. Structure compliance matrix. The second part of the subject discusses the principle of virtual displacements and the direct stiffness method. Bar stiffness matrix, non-force effects, static condensation, structure stiffness matrix and localization. Computer solutions of basic construction types. The third part of the course deals with the analysis of plates and simplified methods of solving cross-stressed plates.

154SGEA	Land Surveying	Z,ZK	5

Basic information on the Earth, angle and distance measurement, basics of geodetic calculation (traverse, intersection), determination of heights, basics of setting-out, maps for designing, basics of photogrammetry, basics of error theory and adjustment calculus, determination of areas and volumes, modern geodetic instruments and methods (electronic techeometers, GPS, laser scanners), basic geodetic rules.

Code of the group: BA20190500
Name of the group: Architektura a stavitelství, 5. semestr
Requirement credits in the group: In this group you have to gain at least 24 credits
Requirement courses in the group: In this group you have to complete at least 6 courses
Credits in the group: 24
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**
124PSA4	**Buildings A4** *Zuzana Rácová, Veronika Kačmaříková, Hana Najmanová, Pavla Ryparová, Daniela Šejnová Pitelková, Petr Hejtmánek, Martin Jiránek, Marek Pokorný, Malila Noori* ***Marek Pokorný*** *Martin Jiránek (Gar.)*	Z,ZK	5	2P+1C	Z	z
127UB01	**Urban Planing 1** *Vojtěch Kořalka, Ivan Kaplan, Václav Jetel* ***Václav Jetel*** *Ivan Kaplan (Gar.)*	Z,ZK	6	2P+2C	Z	z
129DA01	**History of Architecture 1** *Josef Záruba Pfeffermann* ***Josef Záruba Pfeffermann*** *Josef Záruba Pfeffermann (Gar.)*	ZK	3	2P	Z	z
129NB03	**Architectural typology 3** *Jan Růžička, Nikola Puchelová, Petra Novotná, Radek Zykan, Luboš Knytl, Eva Kosíková, Štěpánka Hájková, Tomáš Šenberger* ***Jana Hořická*** *Luboš Knytl (Gar.)*	Z	3	1P+2C	Z	z
133BZA1	**Concrete and Masonry Structures in Architecture 1** *Hana Hanzlová, Karel Šeps* ***Hana Hanzlová*** *Hana Hanzlová (Gar.)*	Z,ZK	5	2P+2C	Z	z
135GEA	**Geology** *Jan Jelínek, Svatoslav Chamra, Jan Schröfel, Richard Malát, Kateřina Kovářová* ***Kateřina Kovářová*** *Kateřina Kovářová (Gar.)*	Z,ZK	2	1P+1C	Z	z

Characteristics of the courses of this group of Study Plan: Code=BA20190500 Name=Architektura a stavitelství, 5. semestr

124PSA4	Buildings A4	Z,ZK	5

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

127UB01	Urban Planing 1	Z,ZK	6

The course introduces the student to individual functional systems in cities and their zones and prepares him/her for designing parts of settlements from the perspective of urban typology and urban design conditions. In particular, it focuses on the design conditions of residential zones and parcelling, traffic calming and segregation, public and commercial amenities, public green spaces, etc. It supplements the overview and conceptual principles with a number of examples from the Czech Republic and abroad. The exercise is intended to apply the knowledge to the design of an urban residential complex for the first time, first using a model example.

129DA01	History of Architecture 1	ZK	3

Subject DA1 is an introductory series of lectures on the history of architecture. It is intended to provide the student with a basic historical overview of the ancient and early medieval with overlaps into later epochs. It is subsidized by 2 hours per week. The basis of the lectures is to acquaint the student not only with the history of ancient architecture, but also with theoretical works of antiquity and with the morphology of classical orders and its use for architect's own creativity.

129NB03	Architectural typology 3	Z	3

The lectures are divided into 3 topics - sustainable architecture, buildings for industry and buildings for agriculture and the village. The first part is dedicated to buildings from the point of view of energy efficiency and sustainability, the second part is focused on topics related to agriculture and the specifics of the village, the last part focuses on the typology of industrial buildings, presented in a historical context (pre-industrial and industrial buildings) and with regard to their basic nature of production (single-purpose, multi-purpose and combined buildings). The lectures also cover the topic of industrial heritage, its identification, evaluation and methods of protection.

133BZA1	Concrete and Masonry Structures in Architecture 1	Z,ZK	5

Properties of concrete and reinforcement, interaction of concrete and reinforcement, behavior (static action) of concrete elements, ultimate limit states - bearing capacity of reinforced concrete cross-sections in bending, bearing capacity in shear, reinforcing principles for slabs and beams, elements under N+M, serviceability limit states. Masonry structures. Prestressed concrete.

135GEA	Geology	Z,ZK	2

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. Last but not least, the course includes a brief excursion into the degradation of building and decorative stone and the restoration and reconstruction of constructions made of it.

Code of the group: BA20190600
Name of the group: Architektura a stavitelství, 6. semestr
Requirement credits in the group: In this group you have to gain at least 20 credits
Requirement courses in the group: In this group you have to complete at least 5 courses
Credits in the group: 20
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
127UR2B	**Urban Planning 2** *Václav Jetel, Simona Vondráčková, Karin Dvořáková, Jiří Kupka, Tereza Jančová, Zuzana Bouška, Tereza Kubištová* ***Jiří Kupka*** *Jiří Kupka (Gar.)*	Z,ZK	4	2P+1C	L	z
129DA02	**History of Architecture 2** *Josef Záruba Pfeffermann, Rudolf Pošva* ***Josef Záruba Pfeffermann*** *Josef Záruba Pfeffermann (Gar.)*	ZK	3	2P	Z	z
133BZA2	**Concrete and Masonry Structures in Architecture 2** *Hana Hanzlová, Karel Šeps* ***Hana Hanzlová*** *Hana Hanzlová (Gar.)*	Z,ZK	5	2P+2C	L	z
134DOA1	**Steel and Timber Structures in Architecture 1** *František Wald* ***František Wald*** *František Wald (Gar.)*	Z,ZK	4	2P+2C	L	z
135MZA	**Soil mechanics and foundation engineering** *Jan Záleský, Josef Jettmar, Jan Salák* ***Jan Záleský*** *Jan Záleský (Gar.)*	Z,ZK	4	2P+2C	L	z

Characteristics of the courses of this group of Study Plan: Code=BA20190600 Name=Architektura a stavitelství, 6. semestr

127UR2B	Urban Planning 2	Z,ZK	4

The course covers several basic thematic areas, especially an introduction to urban composition as a creative synthesis of all components of an urban work, expressed in the composition of spaces and materials, an introduction to rural urbanism, including landscape contexts and some contemporary problems of urbanism, and selected current issues of contemporary urbanism. The individual topics are interpreted in the necessary historical context, insofar as it is relevant to the current state of the subject. The exercises, among other things, test the knowledge from the lectures and apply the urban planning knowledge acquired so far (proposal based on the knowledge from Urbanism 1).

129DA02	History of Architecture 2	ZK	3

The course DA2 is the second series of lectures on history of architecture. It is intended to provide the student with a basic historical overview of the architecture of antiquity with overlaps into later eras. It is subsidized for 2 hours a week. The basis of the lectures is to acquaint the student not only with the history of medieval and early modern architecture, but also with the theoretical works of Renaissance architects.

133BZA2	Concrete and Masonry Structures in Architecture 2	Z,ZK	5

Design of concrete elements under stress combinations, bearing capacity of slender pressed elements, bearing capacity in punching and twisting. Analysis of the behavior of reinforced concrete elements and structures. Design process. Static action, choice and application of calculation models and methods, procedures of simplified methods and principles of reinforcement of individual types of structures - ceiling slabs, frames, walls, stairs, wall beams, basement and retaining walls, foundations. Precast structures.

134DOA1	Steel and Timber Structures in Architecture 1	Z,ZK	4

Students learn the steel elements supporting structures, manufacturing, designing of beams, columns, joints, and ocelobetonovými structures, basic fire design and corrosion protection. the multi-storey buildings and halls are introduced.

135MZA	Soil mechanics and foundation engineering	Z,ZK	4

Origin and composition of soil, basic properties, classification. Stresses in soil. Permeability, compressibility and strength of soils, Mohr's theory of failure. Principles of laboratory and field testing of soils. Soil pressures on structures, slope stability. Bearing capacity and deformation in flat and deep foundations. Foundation technology, construction pits. Principles of foundation soil improvement. Basic principles of monitoring in geotechnical engineering.

Code of the group: BA20150700
Name of the group: Architektura a stavitelství, 7. 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 8 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
122TS1A	**Technology of Construction** *Pavel Neumann, Tomáš Váchal, Václav Pospíchal, Rostislav Šulc, Michal Kovářík* ***Tomáš Váchal*** *Václav Pospíchal (Gar.)*	Z,ZK	4	2P+1C	Z	z
126MMA2	**Economics and Management** *Dana Měšťanová, Václav Tatýrek* ***Václav Tatýrek*** *Václav Tatýrek (Gar.)*	Z,ZK	5	2P+2C	L	z
126SPSK	*Dana Měšťanová* ***Dana Měšťanová*** *Dana Měšťanová (Gar.)*	Z	2	2P	Z	z
129ATV4	**Design studio (Constructional Design)** *Jan Růžička, Pavel Filsak, Štěpán Lajda, Ctislav Fiala, Lenka Maierová, Karel Kabele, Stanislav Frolík, Vojtěch Mazanec, Martin Stark, ...* ***Jan Růžička*** *Jan Růžička (Gar.)*	KZ	9	6C	Z,L	z
129DA03	**History of Architecture 3** *Josef Záruba Pfeffermann, Lenka Popelová, Petr Urlich, Radomíra Sedláková* ***Josef Záruba Pfeffermann*** *Josef Záruba Pfeffermann (Gar.)*	ZK	4	2P	Z	z
134ODA2	**Steel and Timber Structures in Architecture 2** *Jakub Dolejš* ***Jakub Dolejš*** *Jakub Dolejš (Gar.)*	Z,ZK	4	2P+1C	Z	z
136DSA	**Road and Rail Construction** *Michal Uhlík, Michal Weber* ***Michal Uhlík*** *Michal Uhlík (Gar.)*	Z	2	1P+1C	Z	z
100ODPR	**Industrial Training (3 weeks)** *Petr Hájek, Jan Růžička, Kateřina Sojková* ***Michal Jandera*** *Michal Jandera (Gar.)*	Z	0	6C	Z,L	z

Characteristics of the courses of this group of Study Plan: Code=BA20150700 Name=Architektura a stavitelství, 7. semestr

122TS1A	Technology of Construction	Z,ZK	4

The subject deals with basic technologies and technological procedures, as well as supplier documentation and the realization of building structures

126MMA2	Economics and Management	Z,ZK	5

Construction, civil engineering and construction work. Life cycle of building and project. Construction projects and documentation. Participants on construction projects. Determining the cost of construction. Total construction costs. Scheduling and network analysis. Valuation of works and budgeting. Costing and bid price. Production calculation. Calculation methods. Public revenues and tax system. Awarding construction contracts. Public business competition. Contract - clauses additions. Construction business. Organizational structure and management of construction firm. Supply Management. Marketing of construction firm. Making management structures. Controlling. Site manager, foreman, technical supervision, cost and author. Control days. Construction diary. Executed work and supplies quality. Production invoice and final calculation. Changes and additions to the budget. Building handover and acceptance. Investment effectiveness, Construction project evaluation. Marketing. Building changes prior completion, building handover and acceptance, handover documentation. Decision processes. Invested energy. BOM. Audit, Documentation rules. Insolvency, RIPRAN, LEED, BREEAM. Documentation rules, Insolvency law.

126SPSK		Z	2

Territorial planning and construction code law. Public procurement law. Definition of terms. Commercial contractual relationships. Main contract types in construction - contract of the conclusion of a future contract, purchase contract, contract for work, Contents of the contract.

129ATV4	Design studio (Constructional Design)	KZ	9

The subject of the Design studio 4 is an architectural development of selected studies from ATV 1 (residential buildings), ATV2 (small public building) or ATV3 (large public building), a detailed structural, materials and technology design of the whole building or its part, including structural and architectural details. Preliminary structural analysis and building service systems concept are part of the students outcomes. Despite of architectural concept special attention is focused on building energy concept, complex building quality including sustainable building and quality of internal microclimate.

129DA03	History of Architecture 3	ZK	4

The subject deals with architecture from classicism to postmodernism. Each development stage is presented in a wider social context with an emphasis on understanding the theoretical basis of the given concepts. Emphasis is placed on understanding the main formal features of individual styles and directions, typological and structural development, the application of which is expected in future architectural practice. The subject also touches on the development of urbanism.

134ODA2	Steel and Timber Structures in Architecture 2	Z,ZK	4

The course introduces students to the static and structural design of timber structures in civil engineering. Material properties, the design rules according to European standards and principles of good structural design are presented within the course.

136DSA	Road and Rail Construction	Z	2

Introduction to road construction, legislation and regulations, design elements of the route, function of communication depending on its meaning, width layout design - extravillan vs. Intravillage. Urban engineering and the specifics of urban roads, new construction vs. reconstruction, width arrangement of urban roads, parking, public mass transport and its preferences (rail and non-rail), intersections, bus stations. Pedestrian traffic, pedestrian crossings, residential and pedestrian zones, zones 30, adaptations for the blind and disabled, bicycle traffic, earth figure, road objects, drainage, safety equipment on roads. Roadway (and sidewalk) - construction, distribution, application, layer materials, design according to TP 170, implementation. Project documentation - attachments, negative effects of transport.

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.

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 6
The role of the block: PV

Code of the group: BA20180800_2
Name of the group: Architektura a stavitelství, povinně volitelné předměty, 8. semestr
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 3 courses
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
105YSAS	**Sociology and Psychology** *Jitka Cirklová, Monika Dobiášová* ***Jitka Cirklová*** *Jitka Cirklová (Gar.)*	Z	2	1P+1C		PV
123YSHA	**Bulding Materials in Architecture** *Alena Vimmrová, Klára Kobetičová, Martin Böhm, Dana Němcová* ***Alena Vimmrová*** *Alena Vimmrová (Gar.)*	Z	2	1P+1C	L	PV
124YDRS	**Timber Buildings** *Jan Růžička, Jaroslav Vychytil, Marek Pokorný, Milan Peukert, Kamil Staněk, Lukáš Velebil* ***Jaroslav Vychytil*** *Jan Růžička (Gar.)*	Z	2	1P+1C	L	PV
124YKSD	**Complex Structural Detail** *Jiří Pazderka, Radek Zigler* ***Jiří Pazderka*** *Jiří Pazderka (Gar.)*	Z	2	1P+1C	Z	PV
125YNST	**HVAC and services design** *Hana Kabrhelová* ***Hana Kabrhelová*** *Hana Kabrhelová (Gar.)*	Z	2	1P+1C	Z,L	PV
125YPMT	**Building services systems CAD, modelling and simulation** ***Stanislav Frolík*** *Stanislav Frolík (Gar.)*	Z	2	2C	Z,L	PV
126YVSF	**Small Business Management** *Jana Frková, Olga Heralová* ***Eduard Hromada*** *Eduard Hromada (Gar.)*	Z	2	1P+1C	Z,L	PV
127YSUP	**Landscape Planning (seminar)** *Vojtěch Kořalka, Dušana Korvasová, František Brynda* ***František Pospíšil*** *František Pospíšil (Gar.)*	Z	2	2C	L	PV
127YUR3	**Urban Planning 3** *Václav Jetel, František Pospíšil, Petr Durdík* ***František Pospíšil*** *Petr Durdík (Gar.)*	Z	2	2P	L	PV
129YDA4	**History of Architecture 4** *Josef Záruba Pfeffermann* ***Josef Záruba Pfeffermann*** *Josef Záruba Pfeffermann (Gar.)*	Z	2	2C	L	PV
129YOPA	**Heritage preservation** *Klára Kroftová* ***Klára Kroftová*** *Klára Kroftová (Gar.)*	Z	2	2P	L	PV
129YPSA	**Psychology of Architecture** *Lukáš Kolibár, Karel Smejkal, Iva Beňová* ***Karel Smejkal*** *Karel Smejkal (Gar.)*	Z	2	1P+1C	L	PV
132YKPA	**Statics for Architecture** ***Aleš Jíra***	Z	2	1P+1C	Z,L	PV
133YBKC	**Concrete and Masonry Structures 1** *Petr Bílý, Jakub Holan* ***Petr Bílý*** *Petr Bílý (Gar.)*	Z	2	2C	Z,L	PV
134YNKS	**Glass Structures** *Martina Eliášová* ***Martina Eliášová*** *Martina Eliášová (Gar.)*	Z	2	1P+1C	L	PV
135YKA	**Stones in architecture** *Svatoslav Chamra, Kateřina Kovářová* ***Kateřina Kovářová*** *Kateřina Kovářová (Gar.)*	Z	2	1P+1C	L	PV

Characteristics of the courses of this group of Study Plan: Code=BA20180800_2 Name=Architektura a stavitelství, povinně volitelné předměty, 8. semestr

105YSAS	Sociology and Psychology	Z	2
The subject is conceived as a synthesis of selected chapters from psychology and sociology. He deals with the psychology of work and organization, managerial psychology, social psychology and the use of psychology in corporate communication. In the part of sociology, attention is focused on the sociology of the city and the region, the sociology of housing and selected themes from sociology of the company.			
123YSHA	Bulding Materials in Architecture	Z	2
Deeper knowledge of building materials from the point of view of their architectural properties. New structural materials, composite materials, smart materials. Materials for exterior and interior surfaces. Choice of suitable material. Laboratory tests of some material properties - durability, frost resistance, water absorption, hardness.			
124YDRS	Timber Buildings	Z	2
The aim is to present a complex overview on energy efficient timber structures. Basic theoretical and design principals are presented. The lectures are focused on following technologies of timber structures: (i) heavy timber skeleton systems, (ii) light timber structures based on 2x4. (iii) CLT, (iv) log house. All technologies of timber structures are presented in structural and building physics context of low energy and passive buildings.			
124YKSD	Complex Structural Detail	Z	2
The aim of the course is to extend the knowledge gained in previous courses - it is intended for students who have already reached advanced level of knowledge about structural problems in buildings. The content of the course is focused on the complex solution of construction details, following all legislative requirements and taking into account the maximum efficiency and durability of the chosen solution.			

125YNST	HVAC and services design	Z	2
Basic principles of the designing of sanitary systems, heating and ventilation. Design of the heat source, heat emitters, potable water demand, amount of ventilation air, design of air-handling unit and design of indoor systems.			
125YPMT	Building services systems CAD, modelling and simulation	Z	2
Introductory course in computer aided modelling and design of building services systems.			
126YVSF	Small Business Management	Z	2
The subject is divided into lectures 1 hour per week and exercises 1 hour per week. Lectures take place according to the course outline listed below. In the exercise, students prepare their own business plan for a selected business activity according to the specified syllabus. They draw up a plan for a start-up business. Entrepreneurship can take the form of both: a self-employed person and a legal entity, e.g. Ltd. The financial plan is prepared in Excel, and the credit condition is the presentation of the business plan in power point in front of the auditorium.			
127YSUP	Landscape Planning (seminar)	Z	2
The course gives a comprehensive idea of procedures in land-use planning on specific examples, where students individually process the individual phases of the land-use planning process from the analysis of the territory to a simple design and its transcription into the regulation of the territory. Successful completion of the course will replace the independent compulsory seminar work of the subject YUR3.			
127YUR3	Urban Planning 3	Z	2
Topic subject of the learning is genesis of town development and town planning in the world, in the bohemian territory and in the capital town of Prague. Other topics are concerned present construction law in Czech Republic in the sphere of town planning. There is a view of types of town planning documents and demarcation of competences in the processes of plan procurement.			
129YDA4	History of Architecture 4	Z	2
Field exercises focused on visits to buildings under reconstruction, or buildings where various types of interventions in historical buildings can be monitored. especially in the capital city of Prague. The course tries to focus on recent buildings and reconstructions that were not covered in the overview of the history of architecture.			
129YOPA	Heritage preservation	Z	2
The heritage fund of the Czech Republic is very extensive, extremely valuable and very diverse. The abundance of cultural monuments evokes the need for quality monument care, without which it is impossible to preserve this heritage for future generations.			
129YPSA	Psychology of Architecture	Z	2
Applied application of psychology knowledge for engineering graduates.			
132YKPA	Statics for Architecture	Z	2
133YBKC	Concrete and Masonry Structures 1	Z	2
Introduction to selected computer programs for structural modeling. Fundamentals of the finite element method. Basic types of elements for modeling of structures. Principles for choosing a suitable model. Practical procedures for the design and assessment of reinforced concrete structures using software tools. Principles and methods of interpretation and verification of results. Practical examples.			
134YNKS	Glass Structures	Z	2
The course is intending to introduce the students the field of structural applications of glass and to give them some specific skills for calculation and detailing of for basic glass structures: panes beams and fins, columns and walls, point-supported glass, as well as for glazing systems such as glass facades, canopies and roofs, stairs and floors. On this purpose the properties of glass as structural material will be presented in comparison with other basic building materials, together with selected examples of glass/glazing applications. Design details and connecting technology, relevant technical regulations, specification and current methods applied in design will be described. Worked examples will accompany the lectures for better understanding, and design project will help to fix specific knowledge.			
135YKA	Stones in architecture	Z	2
The course "Stone in Architecture" is an excursion into the use of natural stone as a building and decorative material, not only from the perspective of the present but also from the past. Emphasis is placed on the familiarity with the main properties of rocks that affect their usability in practice, what influences these properties both in the formation itself and over time in construction. Attention is paid to the methods of quarrying stone, the possibilities and methods of its working, the specifics of the use of stone in the exterior and interior. At the same time, attention is paid to the problems of durability and restoration and reconstruction of stone objects. Last but not least, students are introduced to the basic technical standards related to the issue. The course includes two excursions to the building and decorative stone of Prague, if possible also to a demonstration of the reconstruction or restoration of a historical building.			

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

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

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

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

TV1	Physical Education	Z	0
TV2	Physical Education	Z	0

Name of the block: Elective courses

Minimal number of credits of the block: 0
The role of the block: V

Code of the group: BA20150300_V
Name of the group: volitelné předměty pro program Architektura a stavitelství
Requirement credits in the group:
Requirement courses in the group:
Credits in the group: 0
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
129XA3K	**Architectural Drawing 1** *Kamila Housová Mizerová, Ctibor Havelka, Vratislav Ševčík* ***Zuzana Pešková*** *Vratislav Ševčík (Gar.)*	KZ	1	3C		V
129XA4K	**Plein Air Drawing (1 week)** *Kamila Housová Mizerová, Jan Kašpar, Zuzana Pešková, Vratislav Ševčík* ***Zuzana Pešková*** *Zuzana Pešková (Gar.)*	Z	1	2C	L	V

Characteristics of the courses of this group of Study Plan: Code=BA20150300_V Name=volitelné předměty pro program Architektura a stavitelství

129XA3K	Architectural Drawing 1	KZ	1

The recommended XA3K drawings are exercises for those already advanced in drawing. For students, more challenging image composing is included that goes beyond the real-world imaging. Work on the larger format- A2 and pen drawing techniques assume experience already gained from previous required exercises. Drawing machines and vehicles in the collections of the National Museum of Agriculture in Prague and the National Technical Museum has become a traditional drawing training for students. The composition is about blending and combining the overall shape of the machine with details exaggerated in scale that are characteristic of its function in practical use. The aim is to practice spatial vision and the ability to design the actual arrangement of the composition of an object and its masses in a given space. On this basis, the quality of the drawing expression is further assessed.

129XA4K	Plein Air Drawing (1 week)	Z	1

Drawing en plein air. The opportunity for full concentration and intensive work is made possible by a number of days of continuous drawing practice. It brings an increase in the level of drawing as well as the opportunity to try other art techniques: watercolour, pastel, red, charcoal, etc. The aim of the plein air is to practise drawing and the use of painting techniques from sketch, compositional sketch to more demanding studies. Emphasis is placed on depicting space through seen perspective, capturing proportional relationships and scale. On this basis, the artistic quality of the drawing or painting is further appreciated.

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 4
The role of the block: S

Code of the group: BA20150100_1
Name of the group: Architektura a stavitelství, povinně volitelný předmět, 1. 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
101YPZO	**Computer Modelling of Objects** *Iva Malechová, Hana Lakomá* ***Hana Lakomá*** *Hana Lakomá (Gar.)*	Z	2	2C	Z	S
105YPDF	**Digital Photography** *Markéta Štindlová* ***Markéta Štindlová*** *Markéta Štindlová (Gar.)*	Z	2	2C	Z	S
105YPRA	**Law (general)** *Pavla Voříšková* ***Pavla Voříšková*** *Pavla Voříšková (Gar.)*	Z	2	2P	Z	S
105YRET	**Rhetoric** *Monika Dobiášová* ***Monika Dobiášová*** *Monika Dobiášová (Gar.)*	Z	2	2C	Z,L	S
124YZSK	**Plotting of Building Structures** *Michal Ženíšek* ***Michal Ženíšek*** *Jan Růžička (Gar.)*	Z	2	2C	Z,L	S

Characteristics of the courses of this group of Study Plan: Code=BA20150100_1 Name=Architektura a stavitelství, povinně volitelný předmět, 1. semestr

101YPZO	Computer Modelling of Objects	Z	2

Modeling of specified objects and own designs in 3D and visualization of obtained models. The tools used are the surface 3D NURBS modeler Rhinoceros and the parametric modeling module Grasshopper.

105YPDF	Digital Photography	Z	2
In the introduction, the basic technical principles of creating and preserving the electronic image will be explained as a basis for understanding the entire system. Further lessons will be devoted to the construction and control of photographic equipment and general and specific imaging techniques for various photodocumentation areas. We also pay special attention to digital image processing, basic optimization and advanced editing techniques. The basic software tools will be. Adobe Photoshop and Camera RAW. After mastering the techniques of building a photographic image, the course will lead learners to understand the specific speech of photography. We will clarify the principles of photographic image, compositional patterns and the possibilities of art solutions and effects. The subject follows the path from simple mechanical recording to author's expression. It will lead the listener to master all the means of photography and composing procedures to achieve perfect picture information as well as emotional exposure to the viewer. The form of the course is quite practical, seminar, atelier. Some tasks will be solved by the teacher together with the teacher, the other separately, with the procedures and results being consulted and discussed in the group. The tutorial will cover the entire photographic process from scanning, through editing to printing. The output will be a small set of each listener with an exhibition potential. The seminar program will not avoid any genre, but emphasis will be placed on the photo of architecture.			
105YPRA	Law (general)	Z	2
105YRET	Rhetoric	Z	2
The participants of this course shall gain and improve skills that are needed for successful professional communication in practice. The study helps to develop culture and effectiveness of verbal communication in written and oral form and of nonverbal communication. It assists in overcoming eventual psychological barriers during public performance, so that the speaker can build up a favorable personal image in the audience. These skills can be employed even outside the professional field. The course instructs also on preparation of written material and visual aids. The ?Rhetoric? course covers the foundations of the field and serves as an overview course.			
124YZSK	Plotting of Building Structures	Z	2
The subject is focused on drawing construction drawings and the basics of AutoCAD.			

Code of the group: BA20190200_1
Name of the group: Architektura a stavitelství, počítačová grafika, 2. 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
129YGA1	**ArchiCad 1 - Elementary** *Klára Škodová, Anna Marie Černá, Martin Souček, Martin Štibor, Vladimír Hamata* ***Vojtěch Dvořák*** *Vojtěch Dvořák (Gar.)*	Z	2	2C	L,Z	S
129YGA2	**ArchiCad 2 - Advanced** *Anna Marie Černá, Vladimír Hamata* ***Vojtěch Dvořák*** *Vojtěch Dvořák (Gar.)*	Z	2	2C	L,Z	S
129YGCI	**Cinema** *Jan Dvořák* ***Vojtěch Dvořák*** *Vojtěch Dvořák (Gar.)*	Z	2	2C	L,Z	S
129YGRE	**Revit** *Vojtěch Dvořák, Martin Souček, Jakub Pospíšil, Jaroslav Novotný* ***Vojtěch Dvořák*** *Vojtěch Dvořák (Gar.)*	Z	2	2C	L,Z	S
129YG3D	**3D Max** *Vojtěch Dvořák* ***Vojtěch Dvořák*** *Vojtěch Dvořák (Gar.)*	Z	2	2C	L,Z	S
155YGIS	**ArcGIS** *Jiří Cajthaml, Tomáš Janata* ***Jiří Cajthaml*** *Tomáš Janata (Gar.)*	Z	2	2C	L	S

Characteristics of the courses of this group of Study Plan: Code=BA20190200_1 Name=Architektura a stavitelství, počítačová grafika, 2. semestr

129YGA1	ArchiCad 1 - Elementary	Z	2
The aim of the course is to master the basic tools, features and functions of ArchiCAD for construction and architectural design activities. The course focuses on mastering the basics of working with parametric 3D objects for creating virtual buildings including terrain, furnishing objects, etc., modelling some atypical shapes, generating project documentation including photorealistic outputs (renders).			
129YGA2	ArchiCad 2 - Advanced	Z	2
The course complements, deepens and develops the knowledge of working in ArchiCAD acquired in the basic course (129YACD1). The course focuses mainly on methods and tools for creating custom library elements, including the use of GDL, as well as details of the creation and features of selected ArchiCAD components.			
129YGCI	Cinema	Z	2
The aim of the subject is to present the methods and concepts of creating computer 3D models using general 3D modelers. In the subject, we offer the features of the world-renowned Cinema 4D software from Maxon.			
129YGRE	Revit	Z	2
The Revit building project computer program is built specifically for Building Information Modelling (BIM) and makes it easy for designers and construction professionals to develop initial ideas from concept to implementation through a coordinated and consistent model-based approach. Revit is a standalone application with features for architectural design, HVAC design, structural design and construction.			
129YG3D	3D Max	Z	2
Fundamentals of modelling and visualisation software. Students will practice various modeling techniques that they can use in their architectural designs. Emphasis is placed on modeling and high quality deliverables - renderings, from initial designs to final high quality renderings.			
155YGIS	ArcGIS	Z	2

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

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

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

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

104YCA1	English 1	Z	1
English 1 Course code: 104Y CA1 Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit The aim of the compulsory English course is to enhance the knowledge of lexis and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on professional language (i.e., ESP - technical style) and communicative competence within the construction industry. The course also seeks to teach students to read technical literature and to be able to produce essential written discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a credit. Literature: Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 1 - 5)			
104YCN1	German 1	Z	1
The compulsory course - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, understanding professional texts, and learning the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature: A.Hanáková, J.Dressel: Deutsch im Bauwesen			

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

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

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

104YC2A	English 2	Z,ZK	2
English 2 Course code: 104YC2A Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit and exam The aim of the compulsory English course is to enhance the knowledge of lexis and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on professional language (i.e., ESP - technical style) and communicative competence within the construction industry. The course also seeks to teach students to read technical literature and to be able to produce essential written discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a credit and an examination. Literature: Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 6 10)			
104YC2N	German 2	Z,ZK	2
The compulsory course - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, understanding professional texts, and learning the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature: A.Hanáková, J.Dressel: Deutsch im Bauwesen			

Name of the block: Alternativní předměty
Minimal number of credits of the block: 16
The role of the block: OO

Code of the group: BA20190500_1
Name of the group: volba atelieru, 5. semestr
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
129AT02	**Design studio 2** *Tomáš Gaál, Richard Bartík, Libor Fránek, Helena Hexnerová, Jolana Zdobinská, Jana Hořická, Vojtěch Dvořák, Jan Kašpar, Ladislav Tichý, ...* ***Jana Hořická*** *Petr Šikola (Gar.)*	KZ	6	6C	Z	OO
129IAS2	**International Design Studio 2** *Hana Bořík ová, Eva Linhartová, Michal Hlaváček* ***Michal Hlaváček*** *Michal Hlaváček (Gar.)*	KZ	6	6C	L	OO

Characteristics of the courses of this group of Study Plan: Code=BA20190500_1 Name=volba atelieru, 5. semestr

129AT02	Design studio 2	KZ	6
The theme of the studio is a small-scale building with one operating circuit in a specific environment. It is a building of a common type of civic amenity of a smaller size. An integral part of the brief is the associated outdoor public space.			
129IAS2	International Design Studio 2	KZ	6
As part of the bachelor's degree, it is possible to complete the studio 129IAS2 International Architectural Studio 2 in English, instead of the studio 129AT02, taught in a joint group with foreign students who come to the university primarily as part of the Erasmus+ program. Students work in teams (2-3 members) in such a way that there should not be students from the same country in the team. This creates the possibility of establishing new relationships, gaining experience from a different work and cultural environment, and expanding communication skills. The IAS2 studio offers the opportunity to prepare for work in an international environment or for an internship abroad. Part of the studio teaching is a 4-day workshop at the FSv training center in Telč.			

Code of the group: BA20190600_1
Name of the group: volba atelieru, 6. semestr
Requirement credits in the group: In this group you have to gain at least 10 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 10
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
129ATA3	**Design studio 3** *Helena Hexnerová, Vojtěch Dvořák, Petra Novotná, Jiří Trojan, Aleš Vaněk, Radek Zykan, Petr Lédl, Luboš Knytl, Anna Šlapetová, ...* ***Petr Lédl*** *Petr Lédl (Gar.)*	KZ	10	8C	L	OO
129IAS3	**International Architectural Studio 3** *Hana Bořík ová, Michal Hlaváček* ***Michal Hlaváček*** *Michal Hlaváček (Gar.)*	KZ	10	8C	L	OO

Characteristics of the courses of this group of Study Plan: Code=BA20190600_1 Name=volba atelieru, 6. semestr

129ATA3	Design studio 3	KZ	10
Studio work is the subject of an application in which students are combining the lessons learned from a wide spectrum of architectural disciplines with their own opinion and artistic creativity. In this third design studio students deal with various types of civil buildings with more complicated service and ambitious operation site with more complicated relationships. After a broad discussion, reflection and assessments of structures built on similar topics, students submit their own proposals in the form of architectural study.			
129IAS3	International Architectural Studio 3	KZ	10
As part of the bachelor's degree, it is possible to complete the studio 129IAS3 International Architectural Studio 3 in English, instead of the studio 129ATA3, taught in a joint group with foreign students who come to the university primarily as part of the Erasmus+ program. Students work in teams (2-3 members) in such a way that there should not be students from the same country in the team. This creates the possibility of establishing new relationships, gaining experience from a different work and cultural environment, and expanding communication skills. The IAS2 studio offers the opportunity to prepare for work in an international environment or for an internship abroad. Part of the studio teaching is a 4-day workshop at the FSv training center in Telč.			

Name of the block: Povinně volitelné předměty, doporučení S1
Minimal number of credits of the block: 24
The role of the block: S1

Code of the group: BA20180800_1
Name of the group: Architektura a stavitelství, bakalářská práce
Requirement credits in the group: In this group you have to gain at least 24 credits
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 24
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
124BPAA	**Bachelor Thesis** *Jaroslav Vychytil, Kateřina Mertenová* ***Petr Hájek***	Z	24	16C	L,Z	S1
125BPAA	**Bachelor Thesis** ***Hana Kabrhelová*** *Stanislav Frolík (Gar.)*	Z	24	16C	L,Z	S1
127BPAA	**Bachelor Thesis** *Ivan Kaplan, Václav Jetel, Daniel Stojan, Karin Dvořáková, Jiří Kupka, Kateřina Štréblová Hronovská, Jiří Kugl, Jan Hendrych* ***Jiří Kupka*** *Jiří Kupka (Gar.)*	Z	24	16C	L,Z	S1
129BPAA	**Bachelor Thesis** *Helena Hexnerová, Hana Boříková, Vojtěch Dvořák, Ladislav Tichý, Václav Dvořák, Petra Novotná, Zuzana Pešková, Jaroslav Daďa, Štěpán Lajda, ...* ***Mikuláš Hulec*** *Mikuláš Hulec (Gar.)*	Z	24	16C	L,Z	S1

Characteristics of the courses of this group of Study Plan: Code=BA20180800_1 Name=Architektura a stavitelství, bakalářská práce

124BPAA	Bachelor Thesis	Z	24

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

125BPAA	Bachelor Thesis	Z	24

Bachelor Thesis is the result of the Bachelor degree study programme. It should prove student`s ability to work independently in the area of Building Services Systems. The thesis can cover theoretical aspects or to focus on practical application on an object within building services systems. Students consult the supervisor and specialists from other departments. The thesis is presented in front of the commission.

127BPAA	Bachelor Thesis	Z	24

The first qualification thesis - an independent professional work of the student, of a larger scope - completing the bachelor's degree of study. The defence of the bachelor thesis is one of the components of the state final examination.

129BPAA	Bachelor Thesis	Z	24

The bachelor's thesis is the basic part of the SZZ. In it, the student demonstrates erudition, creativity and independence. Every bachelor of architecture A+S FSv CTU should be able to design a quality building with a scale and complexity corresponding to a family house. The topic of the bachelor thesis is the design of a family house on a specific site according to the assignment of the thesis supervisor, with emphasis on the context and individuality of the developer, taking into account the requirements for low energy consumption.

List of courses of this pass:

Code	Name of the course	Completion	Credits
100ODPR	Industrial Training (3 weeks)	Z	0

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

101KGA1	Constructive Geometry A	Z,ZK	5

Projections and projective methods. Axonometry. Oblique projection. Orthogonal axonometry. Displaying prisms, cones, cylinders, pyramids, balls. Simple problems in axonometry. Basics of lighting of solids and groupes of solids. Perspective projection. Photogrammetry. Curves, parametrisation. Helical surfaces. Quadrics. Hyperbolic paraboloid, conoids and cylindroids. Next surfaces in building industry.

101M1A	Mathematics 1A	Z,ZK	6

https://mat.fsv.cvut.cz/vyuka/bakalari/eng/zs/MT01/

101M2A	Mathematics 2A	Z,ZK	4

https://mat.fsv.cvut.cz/vyuka/bakalari/eng/ls/MT02/

101M3A	Mathematics 3A	Z,ZK	4

https://mat.fsv.cvut.cz/vyuka/bakalari/M3A

101YPZO	Computer Modelling of Objects	Z	2

Modeling of specified objects and own designs in 3D and visualization of obtained models. The tools used are the surface 3D NURBS modeler Rhinoceros and the parametric modeling module Grasshopper.

104YC2A	English 2	Z,ZK	2

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

104YC2N	German 2	Z,ZK	2

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

104YCA1	English 1	Z	1

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

104YCN1	German 1	Z	1
The compulsory course - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction industry, understanding professional texts, and learning the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Literature: A.Hanáková, J.Dressel: Deutsch im Bauwesen			
105YPDF	Digital Photography	Z	2
In the introduction, the basic technical principles of creating and preserving the electronic image will be explained as a basis for understanding the entire system. Further lessons will be devoted to the construction and control of photographic equipment and general and specific imaging techniques for various photodocumentation areas. We also pay special attention to digital image processing, basic optimization and advanced editing techniques. The basic software tools will be. Adobe Photoshop and Camera RAW. After mastering the techniques of building a photographic image, the course will lead learners to understand the specific speech of photography. We will clarify the principles of photographic image, compositional patterns and the possibilities of art solutions and effects. The subject follows the path from simple mechanical recording to author's expression. It will lead the listener to master all the means of photography and composing procedures to achieve perfect picture information as well as emotional exposure to the viewer. The form of the course is quite practical, seminar, atelier. Some tasks will be solved by the teacher together with the teacher, the other separately, with the procedures and results being consulted and discussed in the group. The tutorial will cover the entire photographic process from scanning, through editing to printing. The output will be a small set of each listener with an exhibition potential. The seminar program will not avoid any genre, but emphasis will be placed on the photo of architecture.			
105YPRA	Law (general)	Z	2
105YRET	Rhetoric	Z	2
The participants of this course shall gain and improve skills that are needed for successful professional communication in practice. The study helps to develop culture and effectiveness of verbal communication in written and oral form and of nonverbal communication. It assists in overcoming eventual psychological barriers during public performance, so that the speaker can build up a favorable personal image in the audience. These skills can be employed even outside the professional field. The course instructs also on preparation of written material and visual aids. The ?Rhetoric? course covers the foundations of the field and serves as an overview course.			
105YSAS	Sociology and Psychology	Z	2
The subject is conceived as a synthesis of selected chapters from psychology and sociology. He deals with the psychology of work and organization, managerial psychology, social psychology and the use of psychology in corporate communication. In the part of sociology, attention is focused on the sociology of the city and the region, the sociology of housing and selected themes from sociology of the company.			
122TS1A	Technology of Construction	Z,ZK	4
The subject deals with basic technologies and technological procedures, as well as supplier documentation and the realization of building structures			
123SHMA	Building Materials	Z,ZK	3
Building materials - basic course. Clasification of the materials. Structure of materials. Main properties of materials. Application of materials in building constructions. Introduction to material testing.			
123YSHA	Bulding Materials in Architecture	Z	2
Deeper knowledge of building materials from the point of view of their architectural properties. New structural materials, composite materials, smart materials. Materials for exterior and interior surfaces. Choice of suitable material. Laboratory tests of some material properties - durability, frost resistance, water absorption, hardness.			
124BPAA	Bachelor Thesis	Z	24
The topics of bachelor's theses are based on the needs of practice or the scientific research activities of the department, scope and difficulty correspond to the student's knowledge acquired during bachelor's studies. The supervisor of the bachelor's thesis can designate additional consultants to the student.			
124PSA1	Buildings 1	Z,ZK	5
The concept of design of building structures with a comprehensive consideration of the functional requirements imposed on individual elements. Requirements for building structures, structural system, interaction of elements, spatial effect of the structural system. Vertical load-bearing structures (functions, requirements, principles of the structural design of walls, columns), floor structures (functions, requirements, principles of the structural design of vaults, wooden ceilings, reinforced concrete ceilings, ceramic concrete ceilings, steel and steel concrete ceilings). Expansion joints in load-bearing systems. Structural systems of single and multi-storey buildings, structural systems of long-span structures.			
124PSA2	Buildings 2	Z,ZK	5
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.			
124PSA3	Buildings A3	Z,ZK	6
The subject has two parts. In the first part, the subject deals with the comprehensive design of supporting structures of roofing, indoor and multi-storey buildings and the structural-static effect of the perimeter and roof sheathing. The second part of the course deals with the design of packaging and dividing structures. The construction of flat and pitched roofs, the construction of external envelopes, the construction of opening fillings and light external envelopes, and the construction of partitions, views and floors are discussed."			
124PSA4	Buildings A4	Z,ZK	5
Healthy Buildings Constituents of indoor microclimate, hazardous substances (VOCs, HFRs, heavy metals, moulds, microbes, aerosols, radionuclides, etc.), their sources and health effects. Influence of building structures and materials on quality of indoor microclimate. Design of buildings with respect to optimisation of indoor microclimate. Fire Safety Analysis of fire - course of fire, burning process, fire loading; legislation and European Standards; fire safety solutions - fire project, requirement for fire resistance of buildings, escape ways, distance separation, fire-fighting equipment; fire behaviour of the most used materials (wood, steel, concrete, plastics); protection of building materials against fire (brickwork, concreting, plasters and sprays, coatings, impregnates of wood, encasements, glued facings of mineral fibres); sandwiches from fire point of view; influence of claddings on the course fire; passive protection of building structures - fire walls, fire glazed structures, fire ceiling, draft stops and seals; repressive measures - electric fire signalling, stationary extinguishing devices, smoke extract, hydrant systems.			
124SFA	Building Physics 1A	Z,ZK	7
Heat transfer, Fourier laws, thermal resistance, thermal transmittance, mean thermal transmittance, energy performance of buildings, energy need for heating, energy use, primary energy, diffusion and condensation of water vapor, internal surface temperature, risk of mould growth, thermal bridges and joints. Solar radiation and its importance. Determining the position of the Sun in the sky using numerical and graphical methods. Insolation. Meaning of terms, requirements. Daylighting. Criteria and limits. Lighting systems. The principle of determining the daylight factor by calculation and measurement. Parts of the daylight factor. Qualitative aspect of daylighting (uniformity, direction of light incidence, etc.). Concepts of sound and noise. Criteria and limits. Acoustic quantities, symbols and calculation. Sound propagation outdoors and indoors. Sound attenuation due to aperture. Direct and diffuse sound field. Reverberation time and reverberation radius. Sound absorbing structures. Structural acoustics. Sound insulation. Sound reduction index. Impact noise. Indirect transmission.			
124YDRS	Timber Buildings	Z	2
The aim is to present a complex overview on energy efficient timber structures. Basic theoretical and design principals are presented. The lectures are focused on following technologies of timber structures: (i) heavy timber skeleton systems, (ii) light timber structures based on 2x4. (iii) CLT, (iv) log house. All technologies of timber structures are presented in structural and building physics context of low energy and passive buildings.			
124YKSD	Complex Structural Detail	Z	2
The aim of the course is to extend the knowledge gained in previous courses - it is intended for students who have already reached advanced level of knowledge about structural problems in buildings. The content of the course is focused on the complex solution of construction details, following all legislative requirements and taking into account the maximum efficiency and durability of the chosen solution.			

124YZSK	Plotting of Building Structures	Z	2
	The subject is focused on drawing construction drawings and the basics of AutoCAD.		
125BPAA	Bachelor Thesis	Z	24
	Bachelor Thesis is the result of the Bachelor degree study programme. It should prove student`s ability to work independently in the area of Building Services Systems. The thesis can cover theoretical aspects or to focus on practical application on an object within building services systems. Students consult the supervisor and specialists from other departments. The thesis is presented in front of the commission.		
125TB2	Building Services Systems 2	Z,ZK	4
	This subject includes an introduction to ventilation and air conditioning in buildings and solutions for electric instalations and artificial lighting.		
125TBA1	Building Services Systems 1	Z,ZK	4
	Basic course in building services systems - water supply, drainage, gas supply and heating systems.		
125YNST	HVAC and services design	Z	2
	Basic principles of the designing of sanitary systems, heating and ventilation. Design of the heat source, heat emitters, potable water demand, amount of ventilation air, design of air-handling unit and design of indoor systems.		
125YPMT	Building services systems CAD, modelling and simulation	Z	2
	Introductory course in computer aided modelling and design of building services systems.		
126MMA2	Economics and Management	Z,ZK	5
	Construction, civil engineering and construction work. Life cycle of building and project. Construction projects and documentation. Participants on construction projects. Determining the cost of construction. Total construction costs. Scheduling and network analysis. Valuation of works and budgeting. Costing and bid price. Production calculation. Calculation methods. Public revenues and tax system. Awarding construction contracts. Public business competition. Contract - clauses additions. Construction business. Organizational structure and management of construction firm. Supply Management. Marketing of construction firm. Making management structures. Controlling. Site manager, foreman, technical supervision, cost and author. Control days. Construction diary. Executed work and supplies quality. Production invoice and final calculation. Changes and additions to the budget. Building handover and acceptance. Investment effectiveness, Construction project evaluation. Marketing. Building changes prior completion, building handover and acceptance, handover documentation. Decision processes. Invested energy. BOM. Audit, Documentation rules. Insolvency, RIPRAN, LEED, BREEAM. Documentation rules, Insolvency law.		
126SPSK		Z	2
	Territorial planning and construction code law. Public procurement law. Definition of terms. Commercial contractual relationships. Main contract types in construction - contract of the conclusion of a future contract, purchase contract, contract for work, Contents of the contract.		
126YVSF	Small Business Management	Z	2
	The subject is divided into lectures 1 hour per week and exercises 1 hour per week. Lectures take place according to the course outline listed below. In the exercise, students prepare their own business plan for a selected business activity according to the specified syllabus. They draw up a plan for a start-up business. Entrepreneurship can take the form of both: a self-employed person and a legal entity, e.g. Ltd. The financial plan is prepared in Excel, and the credit condition is the presentation of the business plan in power point in front of the auditorium.		
127BPAA	Bachelor Thesis	Z	24
	The first qualification thesis - an independent professional work of the student, of a larger scope - completing the bachelor's degree of study. The defence of the bachelor thesis is one of the components of the state final examination.		
127UB01	Urban Planing 1	Z,ZK	6
	The course introduces the student to individual functional systems in cities and their zones and prepares him/her for designing parts of settlements from the perspective of urban typology and urban design conditions. In particular, it focuses on the design conditions of residential zones and parcelling, traffic calming and segregation, public and commercial amenities, public green spaces, etc. It supplements the overview and conceptual principles with a number of examples from the Czech Republic and abroad. The exercise is intended to apply the knowledge to the design of an urban residential complex for the first time, first using a model example.		
127UR2B	Urban Planning 2	Z,ZK	4
	The course covers several basic thematic areas, especially an introduction to urban composition as a creative synthesis of all components of an urban work, expressed in the composition of spaces and materials, an introduction to rural urbanism, including landscape contexts and some contemporary problems of urbanism, and selected current issues of contemporary urbanism. The individual topics are interpreted in the necessary historical context, insofar as it is relevant to the current state of the subject. The exercises, among other things, test the knowledge from the lectures and apply the urban planning knowledge acquired so far (proposal based on the knowledge from Urbanism 1).		
127YSUP	Landscape Planning (seminar)	Z	2
	The course gives a comprehensive idea of procedures in land-use planning on specific examples, where students individually process the individual phases of the land-use planning process from the analysis of the territory to a simple design and its transcription into the regulation of the territory. Successful completion of the course will replace the independent compulsory seminar work of the subject YUR3.		
127YUR3	Urban Planning 3	Z	2
	Topic subject of the learning is genesis of town development and town planning in the world, in the bohemian territory and in the capital town of Prague. Other topics are concerned present construction law in Czech Republic in the sphere of town planning. There is a view of types of town planning documents and demarcation of competences in the processes of plan procurement.		
129AAKO	Architectural composition studio	KZ	4
	Students learn to apply knowledge acquired in the subject Introduction to Architecture Design to simple abstract tasks. Principles of Form and Space Composition. Idea and form of abstract surface and spatial composition. The physical model as a form of verification of compositional intentions.		
129AKR	Architectural drawing	KZ	4
	In architectural drawing courses, students learn to correctly perceive and "see" shapes and masses in their proportional relationships, spatial context, scale and visual perspective. Models are first assemblies of geometric solids, then supplemented with draperies and other objects. The listener learns to lay out and optimally place the drawing in the format and to use view, horizon and runs to build the final composition. Ongoing instruction aids in pencil progression while profiling personal handwriting. The goal is to develop spatial vision and gain skills in drawing and sketching, which is indispensable as a means of communication in architectural design. Consistent attention is paid to aspects of shape and mass in space, the expression of light and shadow, plasticity, structure and differentiation of materials.		
129AT01	Design studio 1	KZ	6
	Studio creation is an application subject in which students apply the knowledge gained from a wide range of architectural disciplines with their own artistic opinion and creativity. The theme of the studio is the design of an apartment building of tangible size, with an emphasis on the idea, the concept of the solution, the relationship of the designed object to the surroundings, the object's own spatial structure, layout solution, structural feasibility. It is essential to find a modern artistic and aesthetic expression in the context of the place and the surrounding buildings. Understanding of basic spatial relationships in the design phase of the project using the elementary tools of architectural creation.		
129AT02	Design studio 2	KZ	6
	The theme of the studio is a small-scale building with one operating circuit in a specific environment. It is a building of a common type of civic amenity of a smaller size. An integral part of the brief is the associated outdoor public space.		

129ATA3	Design studio 3	KZ	10
Studio work is the subject of an application in which students are combining the lessons learned from a wide spectrum of architectural disciplines with their own opinion and artistic creativity. In this third design studio students deal with various types of civil buildings with more complicated service and ambitious operation site with more complicated relationships. After a broad discussion, reflection and assessments of structures built on similar topics, students submit their own proposals in the form of architectural study.			
129ATV4	Design studio (Constructional Design)	KZ	9
The subject of the Design studio 4 is an architectural development of selected studies from ATV 1 (residential buildings), ATV2 (small public building) or ATV3 (large public building), a detailed structural, materials and technology design of the whole building or its part, including structural and architectural details. Preliminary structural analysis and building service systems concept are part of the students outcomes. Despite of architectural concept special attention is focused on building energy concept, complex building quality including sustainable building and quality of internal microclimate.			
129ATZ1	Introductory design studio 1	KZ	4
The Studio is the student's first experience of designing a specific building on a specific site. This course follows architectural composition course, which focuses on architectural design as an abstract composition of smaller parts in relation to a larger whole. The core of the course is the architectural design process applied to the design of a simple building. The main goal of the course in general is the mastery of architectural design techniques along with the further development of creativity initiated in architectural composition. The specific aim of the work is to design a small building - an operationally simple object in the context of specified conditions.			
129ATZ2	Introductory design studio 2	KZ	6
The studio follows previous course of Introductory design studio 1. The main focus of the course is to extend the application of the architectural design process to include typological and ergonomic issues. The main aim of the general teaching is, along with the further development of creativity, the mastery of architectural design procedures, the acquisition of work habits and the layout of design work applied to small-scale assignments. The specific aim of the work is the design of a small building, typologically specified, with a housing element.			
129BPAA	Bachelor Thesis	Z	24
The bachelor's thesis is the basic part of the SZZ. In it, the student demonstrates erudition, creativity and independence. Every bachelor of architecture A+S FSv CTU should be able to design a quality building with a scale and complexity corresponding to a family house. The topic of the bachelor thesis is the design of a family house on a specific site according to the assignment of the thesis supervisor, with emphasis on the context and individuality of the developer, taking into account the requirements for low energy consumption.			
129DA01	History of Architecture 1	ZK	3
Subject DA1 is an introductory series of lectures on the history of architecture. It is intended to provide the student with a basic historical overview of the ancient and early medieval with overlaps into later epochs. It is subsidized by 2 hours per week. The basis of the lectures is to acquaint the student not only with the history of ancient architecture, but also with theoretical works of antiquity and with the morphology of classical orders and its use for architect's own creativity.			
129DA02	History of Architecture 2	ZK	3
The course DA2 is the second series of lectures on history of architecture. It is intended to provide the student with a basic historical overview of the architecture of antiquity with overlaps into later eras. It is subsidized for 2 hours a week. The basis of the lectures is to acquaint the student not only with the history of medieval and early modern architecture, but also with the theoretical works of Renaissance architects.			
129DA03	History of Architecture 3	ZK	4
The subject deals with architecture from classicism to postmodernism. Each development stage is presented in a wider social context with an emphasis on understanding the theoretical basis of the given concepts. Emphasis is placed on understanding the main formal features of individual styles and directions, typological and structural development, the application of which is expected in future architectural practice. The subject also touches on the development of urbanism.			
129GPA	Graphic Presentation of Architecture	KZ	5
The GPA course is divided into 2 parallel and complementary parts. One part is devoted to pictorial representation and consists of three lessons per week. Students will learn the basics of architectural drawing and methods of representation - drawing objects in orthogonal, isometric and perspective form, drawing offset figures, drawing greenery and basic geometric solids.The second part is devoted to mastering the basic tools of computer imaging and is subsidised for 2 hours. Students will learn how to make a vector sketch, create a simple 3D model of an object, use post-production to present the object, and assemble the resulting poster from the output of various computer programs. The course therefore has a total of 5 hours of direct teaching per week and is worth 5 credits, which means that a student should spend 125 hours on the course in one semester (75 hours on drawing + 50 hours on computer graphics), direct teaching takes 65 hours (39 hours on drawing + 26 hours on computer graphics), i.e. for self-study and independent work a student should have 60 hours (36 hours on drawing + 24 hours on computer graphics).			
129IAS2	International Design Studio 2	KZ	6
As part of the bachelor's degree, it is possible to complete the studio 129IAS2 International Architectural Studio 2 in English, instead of the studio 129AT02, taught in a joint group with foreign students who come to the university primarily as part of the Erasmus+ program. Students work in teams (2-3 members) in such a way that there should not be students from the same country in the team. This creates the possibility of establishing new relationships, gaining experience from a different work and cultural environment, and expanding communication skills. The IAS2 studio offers the opportunity to prepare for work in an international environment or for an internship abroad. Part of the studio teaching is a 4-day workshop at the FSv training center in Telč.			
129IAS3	International Architectural Studio 3	KZ	10
As part of the bachelor's degree, it is possible to complete the studio 129IAS3 International Architectural Studio 3 in English, instead of the studio 129ATA3, taught in a joint group with foreign students who come to the university primarily as part of the Erasmus+ program. Students work in teams (2-3 members) in such a way that there should not be students from the same country in the team. This creates the possibility of establishing new relationships, gaining experience from a different work and cultural environment, and expanding communication skills. The IAS2 studio offers the opportunity to prepare for work in an international environment or for an internship abroad. Part of the studio teaching is a 4-day workshop at the FSv training center in Telč.			
129NB01	Architectural typology 1	Z,ZK	3
The topics are focused on the basic typology of buildings for housing, accommodation and public catering.			
129NB02	Architectural typology 2	Z,ZK	5
The lectures are devoted to the issue of selected types of civil buildings, especially buildings for healthcare, education, and transport. The lectures focus on operational ties, operational circuits within structures, specific requirements from various points of view - from social to, for example, hygienic. They also note the urban context, technological requirements and construction specifics, typical for the respective range of buildings. The exercises follow the lectures.			
129NB03	Architectural typology 3	Z	3
The lectures are divided into 3 topics - sustainable architecture, buildings for industry and buildings for agriculture and the village. The first part is dedicated to buildings from the point of view of energy efficiency and sustainability, the second part is focused on topics related to agriculture and the specifics of the village, the last part focuses on the typology of industrial buildings, presented in a historical context (pre-industrial and industrial buildings) and with regard to their basic nature of production (single-purpose, multi-purpose and combined buildings). The lectures also cover the topic of industrial heritage, its identification, evaluation and methods of protection.			
129UNA	Introduction to professional practise	ZK	5
The lectures are divided into two tracks. The first is devoted to architectural composition, the basics of understanding the use of compositional principles in architectural design and understanding their effects. It also deals with other key means of architecture, such as structure, color, and material. All the attributes illuminated are presented in their basic, pure form and are further demonstrated on existing buildings of historical, but especially contemporary architecture. The second section is devoted to the problems of the basic principles of space creation in terms of layout requirements, ergonomics, quality of space creation. It is an introduction to the later more specialized subjects of building science. All the principles are presented with examples of mainly contemporary architectural design.			

129XA3K	Architectural Drawing 1	KZ	1
The recommended XA3K drawings are exercises for those already advanced in drawing. For students, more challenging image composing is included that goes beyond the real-world imaging. Work on the larger format- A2 and pen drawing techniques assume experience already gained from previous required exercises. Drawing machines and vehicles in the collections of the National Museum of Agriculture in Prague and the National Technical Museum has become a traditional drawing training for students. The composition is about blending and combining the overall shape of the machine with details exaggerated in scale that are characteristic of its function in practical use. The aim is to practice spatial vision and the ability to design the actual arrangement of the composition of an object and its masses in a given space. On this basis, the quality of the drawing expression is further assessed.			
129XA4K	Plein Air Drawing (1 week)	Z	1
Drawing en plein air. The opportunity for full concentration and intensive work is made possible by a number of days of continuous drawing practice. It brings an increase in the level of drawing as well as the opportunity to try other art techniques: watercolour, pastel, red, charcoal, etc. The aim of the plein air is to practise drawing and the use of painting techniques from sketch, compositional sketch to more demanding studies. Emphasis is placed on depicting space through seen perspective, capturing proportional relationships and scale. On this basis, the artistic quality of the drawing or painting is further appreciated.			
129YDA4	History of Architecture 4	Z	2
Field exercises focused on visits to buildings under reconstruction, or buildings where various types of interventions in historical buildings can be monitored. especially in the capital city of Prague. The course tries to focus on recent buildings and reconstructions that were not covered in the overview of the history of architecture.			
129YG3D	3D Max	Z	2
Fundamentals of modelling and visualisation software. Students will practice various modeling techniques that they can use in their architectural designs. Emphasis is placed on modeling and high quality deliverables - renderings, from initial designs to final high quality renderings.			
129YGA1	ArchiCad 1 - Elementary	Z	2
The aim of the course is to master the basic tools, features and functions of ArchiCAD for construction and architectural design activities. The course focuses on mastering the basics of working with parametric 3D objects for creating virtual buildings including terrain, furnishing objects, etc., modelling some atypical shapes, generating project documentation including photorealistic outputs (renders).			
129YGA2	ArchiCad 2 - Advanced	Z	2
The course complements, deepens and develops the knowledge of working in ArchiCAD acquired in the basic course (129YACD1). The course focuses mainly on methods and tools for creating custom library elements, including the use of GDL, as well as details of the creation and features of selected ArchiCAD components.			
129YGCI	Cinema	Z	2
The aim of the subject is to present the methods and concepts of creating computer 3D models using general 3D modelers. In the subject, we offer the features of the world-renowned Cinema 4D software from Maxon.			
129YGRE	Revit	Z	2
The Revit building project computer program is built specifically for Building Information Modelling (BIM) and makes it easy for designers and construction professionals to develop initial ideas from concept to implementation through a coordinated and consistent model-based approach. Revit is a standalone application with features for architectural design, HVAC design, structural design and construction.			
129YOPA	Heritage preservation	Z	2
The heritage fund of the Czech Republic is very extensive, extremely valuable and very diverse. The abundance of cultural monuments evokes the need for quality monument care, without which it is impossible to preserve this heritage for future generations.			
129YPSA	Psychology of Architecture	Z	2
Applied application of psychology knowledge for engineering graduates.			
132PRA	Strength of Materials A	Z,ZK	4
The subject deals with basic elastoplastic analysis of cross-sections and structures. Uniaxial stress - effect of temperature, statically indeterminate cases, truss deformation, stress distribution. Bending of a beam - simple and combined bending, combination with axial force, tension, core of the cross-section. Ideally elastoplastic material model for uniaxial tension, plastic limit state of cross-sections and structures. Beam stability, perfect and imperfect beam. Plane stress - stress transformation, principal stress, Mohr's circle, principal stress. Shear stress - bending shear. Torsion of circular, massive, thin-walled cross-sections.			
132SMA1	Structural Mechanics 1A	Z,ZK	5
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. 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.			
132SMA2	Structural Mechanics 2A	Z,ZK	4
The subject deals with the basic elastic analysis of statically indeterminate structures. The first part introduces the energy of deformation, the principle of virtual forces, deformation on statically determined structures. Maxwell and Betti's theorem. Force method and its application to statically indeterminate lattice structures, continuous beams, frames, closed frames. Symmetrical structures with symmetrical and antisymmetric loading. Effect of temperature effects and prescribed displacements of supports. Structure compliance matrix. The second part of the subject discusses the principle of virtual displacements and the direct stiffness method. Bar stiffness matrix, non-force effects, static condensation, structure stiffness matrix and localization. Computer solutions of basic construction types. The third part of the course deals with the analysis of plates and simplified methods of solving cross-stressed plates.			
132YKPA	Statics for Architecture	Z	2
133BZA1	Concrete and Masonry Structures in Architecture 1	Z,ZK	5
Properties of concrete and reinforcement, interaction of concrete and reinforcement, behavior (static action) of concrete elements, ultimate limit states - bearing capacity of reinforced concrete cross-sections in bending, bearing capacity in shear, reinforcing principles for slabs and beams, elements under N+M, serviceability limit states. Masonry structures. Prestressed concrete.			
133BZA2	Concrete and Masonry Structures in Architecture 2	Z,ZK	5
Design of concrete elements under stress combinations, bearing capacity of slender pressed elements, bearing capacity in punching and twisting. Analysis of the behavior of reinforced concrete elements and structures. Design process. Static action, choice and application of calculation models and methods, procedures of simplified methods and principles of reinforcement of individual types of structures - ceiling slabs, frames, walls, stairs, wall beams, basement and retaining walls, foundations. Precast structures.			
133YBKC	Concrete and Masonry Structures 1	Z	2
Introduction to selected computer programs for structural modeling. Fundamentals of the finite element method. Basic types of elements for modeling of structures. Principles for choosing a suitable model. Practical procedures for the design and assessment of reinforced concrete structures using software tools. Principles and methods of interpretation and verification of results. Practical examples.			
134DOA1	Steel and Timber Structures in Architecture 1	Z,ZK	4
Students learn the steel elements supporting structures, manufacturing, designing of beams, columns, joints, and ocelobetonovými structures, basic fire design and corrosion protection. the multi-storey buildings and halls are introduced.			
134ODA2	Steel and Timber Structures in Architecture 2	Z,ZK	4
The course introduces students to the static and structural design of timber structures in civil engineering. Material properties, the design rules according to European standards and principles of good structural design are presented within the course.			

134YNKS	Glass Structures	Z	2
The course is intending to introduce the students the field of structural applications of glass and to give them some specific skills for calculation and detailing of for basic glass structures: panes beams and fins, columns and walls, point-supported glass, as well as for glazing systems such as glass facades, canopies and roofs, stairs and floors. On this purpose the properties of glass as structural material will be presented in comparison with other basic building materials, together with selected examples of glass/glazing applications. Design details and connecting technology, relevant technical regulations, specification and current methods applied in design will be described. Worked examples will accompany the lectures for better understanding, and design project will help to fix specific knowledge.			
135GEA	Geology	Z,ZK	2
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. Last but not least, the course includes a brief excursion into the degradation of building and decorative stone and the restoration and reconstruction of constructions made of it.			
135MZA	Soil mechanics and foundation engineering	Z,ZK	4
Origin and composition of soil, basic properties, classification. Stresses in soil. Permeability, compressibility and strength of soils, Mohr's theory of failure. Principles of laboratory and field testing of soils. Soil pressures on structures, slope stability. Bearing capacity and deformation in flat and deep foundations. Foundation technology, construction pits. Principles of foundation soil improvement. Basic principles of monitoring in geotechnical engineering.			
135YKA	Stones in architecture	Z	2
The course "Stone in Architecture" is an excursion into the use of natural stone as a building and decorative material, not only from the perspective of the present but also from the past. Emphasis is placed on the familiarity with the main properties of rocks that affect their usability in practice, what influences these properties both in the formation itself and over time in construction. Attention is paid to the methods of quarrying stone, the possibilities and methods of its working, the specifics of the use of stone in the exterior and interior. At the same time, attention is paid to the problems of durability and restoration and reconstruction of stone objects. Last but not least, students are introduced to the basic technical standards related to the issue. The course includes two excursions to the building and decorative stone of Prague, if possible also to a demonstration of the reconstruction or restoration of a historical building.			
136DSA	Road and Rail Construction	Z	2
Introduction to road construction, legislation and regulations, design elements of the route, function of communication depending on its meaning, width layout design - extravillan vs. Intravillage. Urban engineering and the specifics of urban roads, new construction vs. reconstruction, width arrangement of urban roads, parking, public mass transport and its preferences (rail and non-rail), intersections, bus stations. Pedestrian traffic, pedestrian crossings, residential and pedestrian zones, zones 30, adaptations for the blind and disabled, bicycle traffic, earth figure, road objects, drainage, safety equipment on roads. Roadway (and sidewalk) - construction, distribution, application, layer materials, design according to TP 170, implementation. Project documentation - attachments, negative effects of transport.			
154SGEA	Land Surveying	Z,ZK	5
Basic information on the Earth, angle and distance measurement, basics of geodetic calculation (traverse, intersection), determination of heights, basics of setting-out, maps for designing, basics of photogrammetry, basics of error theory and adjustment calculus, determination of areas and volumes, modern geodetic instruments and methods (electronic techeometers, GPS, laser scanners), basic geodetic rules.			
155YGIS	ArcGIS	Z	2
TV1	Physical Education	Z	0
TV2	Physical Education	Z	0

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