

Study plan

Name of study plan: Stavební inženýrství, obor Konstrukce pozemních staveb

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Building Structures

Garantor of the study branch: doc. Ing. Jitka Vašková, CSc.

Program of study: Civil Engineering

Type of study: Follow-up master full-time

Required credits: 90

Elective courses credits: 0

Sum of credits in the plan: 90

Note on the plan: tento studijní plán platí od nástupu do studia 2019-20, přidán pov. volit. předmět 133YMVB

Name of the block: Compulsory courses

Minimal number of credits of the block: 44

The role of the block: Z

Code of the group: NC20160100

Name of the group: Obor K Konstrukce pozemních staveb, 1. semestr

Requirement credits in the group: In this group you have to gain 23 credits

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

Credits in the group: 23

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
101MA04	Mathematics 4 Jan Chleboun, Ivana Pultarová, Michal Beneš, Jan Lamač Jan Chleboun Jan Chleboun (Gar.)	Z,ZK	5	2P+2C	Z	z
124PS03	Building Structures Vladimír Žďára, Hana Gattermayerová Vladimír Žďára Vladimír Žďára (Gar.)	Z,ZK	4	2P+2C	Z	z
132NAK	Numerical Analysis of Structures Bořek Patzák, Edita Dvořáková, Vladimír Vančík, Tomáš Krejčí Bořek Patzák Bořek Patzák (Gar.)	Z,ZK	5	2P+2C	Z	z
133B03C	Concrete Structures 3C Jan Vítek, Lukáš Vráblík Jan Vítek (Gar.)	Z,ZK	5	2P+2C	Z	z
134O02C	Steel Structures 2C Martina Eliášová Martina Eliášová Martina Eliášová (Gar.)	Z,ZK	4	2P+2C	Z	z

Characteristics of the courses of this group of Study Plan: Code=NC20160100 Name=Obor K Konstrukce pozemních staveb, 1. semestr

101MA04	Mathematics 4	Z,ZK	5
124PS03	Building Structures	Z,ZK	4
132NAK	Numerical Analysis of Structures	Z,ZK	5
133B03C	Concrete Structures 3C	Z,ZK	5
Extension of knowledge in the field of design of reinforced concrete structures, when the emphasis is put on development of engineering sense. Within the scope of this subject, the student acquires ability to estimate arrangement of reinforcement in RC slabs of general shape, ability to define basic strut-and-tie models for given structural details, ability to provide optimum reinforcement at general point of RC slabs and RC walls based on normal forces distributions obtained with common engineering software. Also, the student learns the basic principles plastic design of RC structures and design of RC foundations.			
134O02C	Steel Structures 2C	Z,ZK	4
Deepening of knowledge received from courses 133NNK and 134OK01. Amplifying of theoretical knowledge in the field of steel grade selection, toughness, global analysis of structures, buckling of structural systems, joint classification, and high strength steel and demanding composite steel and concrete structures. Complementation of knowledge from fire resistance of steel and composite structures and detailed design of industrial buildings and crane girders. Design of masts, towers, chimneys, tanks, silos and pipelines, technological structures, pre-stressed steel structures and basis of design from aluminium alloys and stainless steel, and cable and membrane structures.			

Code of the group: NC20160200

Name of the group: obor Konstrukce pozemních staveb, 2. semestr

Requirement credits in the group: In this group you have to gain 21 credits

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

Credits in the group: 21

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
132DY01	Dynamics of structures 1 Tomáš Krejčí, Jiří Máca, Karel Pohl Jiří Máca Jiří Máca (Gar.)	Z,ZK	5	2P+2C	L	Z
132EADC	Experimental Analysis and Diagnostics C Michal Polák, Pavel Padevět, Pavel Tesárek Michal Polák Michal Polák (Gar.)	KZ	3	1P+2C	L	Z
133B04C	Concrete Structures 4C Martin Petřík, Petr Štemberk	Z,ZK	5	2P+2C	L	Z
134DK02	Timber Structures 2 Karel Mikeš Karel Mikeš Karel Mikeš (Gar.)	Z,ZK	4	2P+1C	L	Z
135ZS02	Foundations 2 Jan Masopust, Jan Valenta Jan Valenta Jan Valenta (Gar.)	Z,ZK	4	2P+2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=NC20160200 Name=obor Konstrukce pozemních staveb, 2. semestr

132DY01	Dynamics of structures 1	Z,ZK	5	Principles of theory of vibration, dynamic loading. Free and forced vibration of single-degree-of-freedom systems. Damped vibration. Methods of dynamic analysis of multi-degree-of-freedom systems.		
132EADC	Experimental Analysis and Diagnostics C	KZ	3			
133B04C	Concrete Structures 4C	Z,ZK	5	Extension of knowledge in the field of design of reinforced concrete structures, when the emphasis is put on development of engineering sense. Within the scope of this subject, the student acquires ability to estimate arrangement of reinforcement in RC slabs of general shape, ability to define basic strut-and-tie models for given structural details, ability to provide optimum reinforcement at general point of RC slabs and RC walls based on normal forces distributions obtained with common engineering software. Also, the student learns the basic principles plastic design of RC structures and design of RC foundations.		
134DK02	Timber Structures 2	Z,ZK	4			
135ZS02	Foundations 2	Z,ZK	4			

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: NC20190100_2

Name of the group: obor Konstrukce pozemních staveb, povinně volitelné předměty. 1. a 2. 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 2 courses

Credits in the group: 6

Note on the group:

[1:2][2:4]

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
102YFPL	Solid State Physics in Civil Engineering Jiří Konfršt, Jaroslava Drchalová, Alexey Sveshnikov, Olga Kapičková Jiří Konfršt Jiří Konfršt (Gar.)	Z	2	1P+1C	Z	PV
122YTSD	Technology of Component Production Rostislav Šulc Rostislav Šulc Rostislav Šulc (Gar.)	Z	2	1P+1C	Z	PV
124YBM1	Building Information Modeling (BIM) for Building Structures 1 Kateřina Novotná, Pavel Chour, Renáta Hoďánková, Jakub Veselka, Petr Matějka, Petr Pánek Jan Růžička (Gar.)	Z	4	1P+3C	Z	PV
124YDSR	Demolitions of Buildings and Material Recycling Šárka Šílarová Richard Wasserbauer Šárka Šílarová (Gar.)	Z	2	1P+1C	Z	PV
124YKSD	Complex Structural Detail Jiří Pazderka, Radek Zígler Jiří Pazderka Jiří Pazderka (Gar.)	Z	2	1P+1C	Z	PV
124YZUK	Loading Effects and their Impact on Building Structures Tomáš Čejka, Radek Zígler Radek Zígler	Z	2	1P+1C	Z	PV
132PRPM	Deformation and Failure of Materials Milan Jirásek, Karel Mikeš, Petr Havlásek Milan Jirásek Milan Jirásek (Gar.)	Z,ZK	5	2P+2C	Z	PV
132YMMO	Modern Methods of Optimization Matěj Lepš, Jan Zeman, Adéla Hlobilová Jan Zeman	Z	2	1P+1C	Z	PV
132YSSK	Reliability of Structures Jaroslav Kruis Jaroslav Kruis Jaroslav Kruis (Gar.)	Z	2	1P+1C	Z	PV
133YBEX	Concrete under severe conditions Petr Štemberk, Radek Štefan, Marek Foglar Petr Štemberk (Gar.)	Z	2	1P+1C	Z	PV
133YPRK	Failures and Rehabilitation of Concrete Structures Petr Štemberk Petr Štemberk	Z	2	1P+1C	Z	PV

134YDKM	Timber structures and bridges <i>Anna Kuklíková Anna Kuklíková Anna Kuklíková (Gar.)</i>	Z	2	1P+1C		PV
134YROK	Extending the Life of Steel and Timber Structures <i>Karel Mikeš Karel Mikeš Karel Mikeš (Gar.)</i>	Z	2	1P+1C		PV
134YSMK	Stability and modelling of steel structures <i>Josef Macháček, Michal Jandera Michal Jandera Josef Macháček (Gar.)</i>	Z	2	1P+1C		PV
135YGSM	Geotechnical software for numerical models <i>Jan Pruška, Jan Faltýnek, Jan Ježek Jan Pruška (Gar.)</i>	Z	2	1P+1C	Z	PV
210YDSM	Diagnostics of Building Materials Properties <i>Jiří Litoš Jiří Litoš Jiří Litoš (Gar.)</i>	Z	2	1P+1C		PV
101YMCD	Methods of Time Discretization <i>František Bubeník František Bubeník František Bubeník (Gar.)</i>	Z	2	1P+1C	L	PV
101YMST	Mathematical statistics for technicians <i>Daniela Jarušková Daniela Jarušková (Gar.)</i>	Z	2	1P+1C	L	PV
101YNUM	Numerical Methods <i>Ivana Pultarová, Martin Ladecký Ivana Pultarová Ivana Pultarová (Gar.)</i>	Z	2	1P+1C	L	PV
123YMPU	Materials for Surface Finishing of Building Constructions <i>Miloš Jerman Alena Vimmrová Miloš Jerman (Gar.)</i>	Z	2	1P+1C	L	PV
124YDPH	Diagnosis and Surveying of Building Structures <i>Eva Burgetová Martin Jiránek Eva Burgetová (Gar.)</i>	Z	2	1P+1C	L	PV
124YDRS	Timber Buildings <i>Jan Růžička, Marek Pokorný, Kamil Staněk, Milan Peukert Marek Pokorný Jan Růžička (Gar.)</i>	Z	2	1P+1C	L	PV
124YHVK	Long Span Structures <i>Vladimír Žďára Vladimír Žďára Vladimír Žďára (Gar.)</i>	Z	2	1P+1C	L	PV
124YIKS	Interaction of structures and parts of structures	Z	2	1P+1C	L	PV
124YPFS	Precast concrete structures	Z	2	1P+1C	L	PV
124YRHS	Reconstruction of Historical Building Structures <i>Tomáš Čejka Radek Zigler</i>	Z	2	1P+1C	Z,L	PV
126YBIM	Building Information Modelling - Fundamentals <i>Petr Matějka, Robert Bouška Robert Bouška Robert Bouška (Gar.)</i>	Z	2	2C		PV
126YSP	Construction Cost Estimating Software	Z	2	2C	L	PV
132YNAK	Nonlinear Analysis of Materials and Structures <i>Bořek Patzák, Petr Kabele, Daniel Rypl Petr Kabele Petr Kabele (Gar.)</i>	Z	2	1P+1C	L	PV
132YNA2	Numerical Analysis of Structures 2 <i>Bořek Patzák Bořek Patzák Bořek Patzák (Gar.)</i>	Z,ZK	4	2P+1C	L	PV
132YPM2	Computer Analysis of Structures 2 <i>Jiří Máca, Petr Fajman Jiří Máca Petr Fajman (Gar.)</i>	Z	2	1P+1C	L	PV
132YSAK	Stability and Elasto-plastic Analysis of Structures <i>Daniel Rypl Daniel Rypl Daniel Rypl (Gar.)</i>	Z	2	1P+1C	L	PV
133YATK	Applied Theory of Structures <i>Vladimír Křístek Vladimír Křístek (Gar.)</i>	Z,ZK	4	2P+1C	L	PV
133YMBV	Structural Models and Reinforcing of Concrete Members <i>Radek Štefan, Petr Bílý, Josef Novák Petr Bílý Petr Bílý (Gar.)</i>	Z	2	1P+1C	L	PV
133YPNB	Fire design of concrete and masonry structures <i>Radek Štefan, Jaroslav Procházka Michaela Frantová</i>	Z	2	1P+1C	L	PV
133YVHB	High-performance Concretes <i>Jan Vítek, Josef Fládr, Petr Bílý, Alena Kohoutková Michaela Frantová</i>	Z	2	1P+1C	L	PV
134YHNK	Stainless steel and aluminium structures <i>Josef Macháček, František Wald František Wald Josef Macháček (Gar.)</i>	Z	2	1P+1C		PV
134YNDK	Load-bearing timber roof constructions <i>Karel Mikeš Karel Mikeš Karel Mikeš (Gar.)</i>	Z	2	1P+1C		PV
134YPOD	Fire Resistance of Steel and Timber Structures <i>Zdeněk Sokol Zdeněk Sokol Zdeněk Sokol (Gar.)</i>	Z	2	1P+1C	L	PV
134YSDO	Connections of steel and timber structures <i>František Wald, Robert Jára Robert Jára František Wald (Gar.)</i>	Z,ZK	4	2P+1C	L	PV
134YSKO	Special steel structures <i>Jakub Dolejš Jakub Dolejš Jakub Dolejš (Gar.)</i>	Z,ZK	4	2P+1C		PV
135YING	Engineering geology <i>Jan Valenta, Milan Aue, Vladimír Tylš, Svatoslav Chamra Jan Valenta Jan Valenta (Gar.)</i>	Z	2	1P+1C		PV
135YTIG	Field training in engineering geology <i>Jan Schröfel Jan Schröfel (Gar.)</i>	Z	2	1P+1C		PV
135YVPZ	Computer analysis in underground structures <i>Jan Salák, Jan Pruška, Jan Faltýnek, Jan Ježek Jan Pruška</i>	Z	2	1P+1C	L	PV

Characteristics of the courses of this group of Study Plan: Code=NC20190100_2 Name=obor Konstrukce pozemních staveb, povinné volitelné předměty. 1. a 2. semestr

102YFPL	Solid State Physics in Civil Engineering Solids, crystal structure, chemical bonds, electron microscopes, scanning tunneling microscope, atomic force microscope, diffraction, diffraction methods, semiconductors, p-n junction, photovoltaic effect, solar cells, heat and moisture transport.	Z	2		
122YTSD	Technology of Component Production	Z	2		
124YBM1	Building Information Modeling (BIM) for Building Structures 1	Z	4		
124YDSR	Demolitions of Buildings and Material Recycling	Z	2		
124YKSD	Complex Structural Detail	Z	2		

124YZUK	Loading Effects and their Impact on Building Structures	Z	2
Division of load from history-load point of view, loading effects and forced and non-forced influences. Occurrence-probability of individual load, combination of load, load-connection with the solution of civil engineering. Interaction of static and dynamic loading effects in specialization of building structures, interaction of short-term and long-term effects of load. Computation models of load.			
132PRPM	Deformation and Failure of Materials	Z,ZK	5
Viscoelasticity, models for concrete creep and shrinkage. Theory of plasticity, principles of limit analysis. Fracture mechanics. Damage mechanics.			
132YMMO	Modern Methods of Optimization	Z	2
The course is aimed at an overview of numerical optimization methods applicable not only in the Civil Engineering area. The emphasis is put more on the introduction of driving principles, however, practical applications in MATLAB environment are also conducted during exercises.			
132YSSK	Reliability of Structures	Z	2
The course is devoted to the reliability of elements and systems. Element reliability is time dependent while the reliability of systems is of type strength-load. Complicated cases are solved by the FORM method. Two simulation methods are introduced: Monte Carlo and LHS.			
133YBEX	Concrete under severe conditions	Z	2
133YPRK	Failures and Rehabilitation of Concrete Structures	Z	2
134YDKM	Timber structures and bridges	Z	2
Timber structures focused to national strategy of sustainable development. New timber-based materials. Structural systems of houses and bridges. Repairing and strengthening. Fire design. Production, protection, erection and maintenance. Design and evaluation of bridges, roofs structures in normal temperature and in fire.			
134YROK	Extending the Life of Steel and Timber Structures	Z	2
134YSMK	Stability and modelling of steel structures	Z	2
Subject YSMK covers two parts. The first one deals with stability and strength of steel plates, the second one with stability and strengths of steel frame structures. In the first part the historic collapses of steel structures are analysed including the importance of imperfections for a design of thin plated structures. Presented are principles of theory of buckling, linear and nonlinear theory of buckling of thin plates. The results are applied to the 4th class cross sections in harmony with Eurocode. Buckling due to normal, shear and local loadings including their combination is analysed in a detail. In the end the application of the results is shown together with design of necessary stiffeners. The second part is focused on member and structure stability. Possible global analysis methods are presented together with methods for compression and bending interaction for slender members. In detail, specific cases of lateral torsional buckling are explained including also tapered members.			
135YGS	Geotechnical software for numerical models	Z	2
210YDSM	Diagnostics of Building Materials Properties	Z	2
101YMCD	Methods of Time Discretization	Z	2
101YMST	Mathematical statistics for technicians	Z	2
101YNUM	Numerical Methods	Z	2
123YMPU	Materials for Surface Finishing of Building Constructions	Z	2
Esthetical and protective function of the surface finishing. Types of the surface finishing. Design of the surface of the horizontal and vertical constructions. Materials for the surface finishing. Treatment of the underlayer. Technological requirements. Maintenance and repair of the surface. Special finishing.			
124YDPH	Diagnosis and Surveying of Building Structures	Z	2
124YDRS	Timber Buildings	Z	2
124YHVK	Long Span Structures	Z	2
124YIKS	Interaction of structures and parts of structures	Z	2
124YPFS	Precast concrete structures	Z	2
124YRHS	Reconstruction of Historical Building Structures	Z	2
126YBIM	Building Information Modelling - Fundamentals	Z	2
Subject deals with Building Information Modeling (BIM) topic as with the modern tool for management and operation of construction projects. It is oriented to handling basic relevant software (Autodesk Revit, Autodesk Navisworks) and especially to understanding meaning of BIM in current construction business and its future and importance in specific phases of construction projects.			
126YSP	Construction Cost Estimating Software	Z	2
132YNAK	Nonlinear Analysis of Materials and Structures	Z	2
Students acquaint self with the concepts of linear stability and calculation of elastoplastic load capacity. Linear stability - evaluation of the critical load and buckling shape. Analysis of structures according to the 2nd order theory - equilibrium conditions on a deformed structure, initial stress matrix. Elastoplastic analysis of structures - evaluation of the limit load capacity, distribution of internal forces at the limit state - static incremental method, kinematic method. Solving stability and elastoplasticity problems by means of a general-purpose finite element program.			
132YNA2	Numerical Analysis of Structures 2	Z,ZK	4
Advanced course on finite element method. Formulation of plate elements suitable for thin and thick plates, plates on elastic foundation. Introduction to nonlinear problems: geometrical and material nonlinearity, solution methods, implementation aspects.			
132YPM2	Computer Analysis of Structures 2	Z	2
Limit state of frames. Stability analysis of structures. Second order theory. Beams and gridwork girders on elastic foundation. Plate and wall structures. Dynamic analysis of structures. Verification of results.			
132YSAK	Stability and Elasto-plastic Analysis of Structures	Z	2
Linear stability - determination of critical loading, determination of buckling shape. Analysis of structures according to the 2nd order theory - equilibrium on deformed structure, matrix of initial stresses. Elasto-plastic analysis of structures - determination of ultimate loading, determination of internal forces at ultimate limit state, determination of collapse shape at ultimate limit state - static incremental method, kinematic method.			
133YATK	Applied Theory of Structures	Z,ZK	4
133YMB	Structural Models and Reinforcing of Concrete Members	Z	2
133YPNB	Fire design of concrete and masonry structures	Z	2
Fire design of concrete structures. Nominal and parametric fire exposures. Verification methods of fire resistance. Mechanical, thermal and physical properties of concrete and steel at elevated temperatures. Design procedures: tabulated data or testing, simplified calculation methods, advanced calculation methods. Shear torsion and anchorage of reinforcement. Spalling of concrete. Addition rules for high strength concrete. Calculation of fire design of concrete and masonry structures.			
133YVHB	High-performance Concretes	Z	2
Various types of high-performance concretes - their behaviour and properties. Design and analysis. Examples of practical application of high-performance concretes.			

134YHNK	Stainless steel and aluminium structures	Z	2
Subject YHNK covers two parts: the first concerns design of structures from aluminium alloys, the second deals with stainless steel structures. The first part covers introduction and practice in designing of aluminium structures. The second part covers evolution of stainless steel materials/structures and examples of realized structures. Stainless steels suitable for structures are described in a detail, including their properties. Dissimilarities in assessments of members under common loadings with respect to low-carbon steels is described for both ultimate and serviceability limit states. In the end the possibilities concerning connections of stainless steel members, erection and installation of stainless steel members are described.			
134YNDK	Load-bearing timber roof constructions	Z	2
134YPOD	Fire Resistance of Steel and Timber Structures	Z	2
The class gives introduction to fire modeling, fire safety and fire resistance of steel, steel-concrete composite and timber structural elements.			
134YSDO	Connections of steel and timber structures	Z,ZK	4
The subject allows insight and ability to apply the knowledge related to structural connections and its application by software.			
134YSKO	Special steel structures	Z,ZK	4
The course follows the basic education in the field of steel structures. It focuses on a design of some special construction types, includes parts: High-strength steel construction, Crane supporting structures, Silos and Rope structures.			
135YING	Engineering geology	Z	2
Elements of conceptions of engineering geology and hydrogeology, methods of investigation in engineering geology, maps in geology and engineering geology.			
135YTIG	Field training in engineering geology	Z	2
135YVPZ	Computer analysis in underground structures	Z	2
Numerical methods in CAD/CAM in geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical software both in the field of conventional methods and in numerical modelling domain. Practical solutions of selected geotechnical problems.			

Name of the block: Elective courses

Minimal number of credits of the block: 0

The role of the block: V

Code of the group: NF20150100

Name of the group: volitelná výběrová matematika

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
101YMAV	Mathematics 4 - Selective Course Aleš Nekvinda Aleš Nekvinda Aleš Nekvinda (Gar.)	Z,ZK	5	2P+2C	Z	V

Characteristics of the courses of this group of Study Plan: Code=NF20150100 Name=volitelná výběrová matematika

101YMAV	Mathematics 4 - Selective Course	Z,ZK	5
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Name of the block: Povinně volitelné předměty, doporučení S2

Minimal number of credits of the block: 30

The role of the block: S2

Code of the group: NC20160300_1

Name of the group: obor Konstrukce pozemních staveb, diplomová práce

Requirement credits in the group: In this group you have to gain 30 credits

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

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
122DPM	Diploma Thesis Martin Hlava, Michal Procházka, Miloslava Popenková, Čeněk Jarský, Pavel Svoboda, Pavel Neumann, Karel Polák, Tomáš Váchal, Mária Párová, Tomáš Váchal Miloslava Popenková (Gar.)	Z	30	24C	Z	S2
123DPM	Diploma Thesis Miloš Jerman, Zdenka Bažantová, Alena Vimmrová, Zbyšek Pavlík, Milena Pavlíková, Jiří Maděra, Jaroslav Výborný, Martin Keppert, Eva Vejmelková, Alena Vimmrová	Z	30	24C	Z	S2
124DPM	Diploma Thesis Tomáš Čejka, Marek Pokorný, Martin Jiránek, Anna Lounková, Richard Wasserbauer, Malila Noori	Z	30	24C	Z	S2

132DPM	Diploma Thesis <i>Bořek Patzák, Jiří Máca, Karel Pohl, Michal Polák, Pavel Padevět, Pavel Tesárek, Milan Jirásek, Petr Havlíšek, Matěj Lepš, Milan Jirásek</i>	Z	30	24C	Z	S2
133DPM	Diploma Thesis <i>Michaela Frantová</i>	Z	30	24C	Z	S2
134DPM	Diploma Thesis <i>František Wald, Jakub Dolejš Jakub Dolejš Jakub Dolejš (Gar.)</i>	Z	30	24C	Z	S2
135DPM	Diploma Thesis <i>Jan Masopust Jan Salák</i>	Z	30	24C	Z	S2
210DPM	Diploma Thesis <i>Jiří Litoš, Petr Konvalinka, Radoslav Sovják, Jindřich Fornůsek, Pavel Reiterman, Karel Kolář, Petr Máca Jiří Litoš Jiří Litoš (Gar.)</i>	Z	30	24C	Z	S2
220DPM	Diploma Thesis <i>Jiří Svoboda, Radek Vašíček, Jaroslav Pacovský Radek Vašíček Jiří Svoboda (Gar.)</i>	Z	30	24C	Z	S2

Characteristics of the courses of this group of Study Plan: Code=NC20160300_1 Name=obor Konstrukce pozemních staveb, diplomová práce

122DPM	Diploma Thesis	Z	30
123DPM	Diploma Thesis In accordance with the thesis proposal	Z	30
124DPM	Diploma Thesis	Z	30
132DPM	Diploma Thesis in accordance with the thesis proposal	Z	30
133DPM	Diploma Thesis in accordance with a thesis proposal	Z	30
134DPM	Diploma Thesis	Z	30
135DPM	Diploma Thesis Individual assignment in accordance with the thesis proposal	Z	30
210DPM	Diploma Thesis	Z	30
220DPM	Diploma Thesis Diploma thesis elaboration with possible use of geotechnical laboratory and underground facility the Josef underground laboratory (http://ceg.fsv.cvut.cz).	Z	30

Name of the block: Povinně volitelné předměty, doporučení S1

Minimal number of credits of the block: 10

The role of the block: S1

Code of the group: NC20160100_1

Name of the group: obor Konstrukce pozemních staveb, volitelný projekt, 1. semestr

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

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

Credits in the group: 5

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
122P03C	Structural Design 3C <i>Rostislav Šulc</i>	KZ	5	4C	Z	S1
124P03C	Structural Design 3C <i>Jiří Pazderka, Radek Zigler, František Kulhánek, Martin Jiránek</i>	KZ	5	4C	Z	S1
132P03C	Structural Design 3C <i>Pavel Tesárek, Jan Zeman, Petr Kabele, Michal Šejnoha, Pavel Kuklík, Aleš Jíra, Pavel Reiterman</i>	KZ	5	4C	Z	S1
133P03C	Structural Design 3C <i>Iva Broukalová Jitka Vašková (Gar.)</i>	KZ	5	4C	Z	S1
134P03C	Structural Design 3C <i>Martina Eliášová, Michal Netušil, Karel Mikeš, Anna Kuklíková, Michal Jandera, František Wald, Zdeněk Sokol, Petr Kuklík, Pavel Ryjáček Michal Jandera Michal Jandera (Gar.)</i>	KZ	5	4C	Z	S1
135P03C	Structural Design 3C <i>Jan Kos, Jan Salák, Jan Pruška</i>	KZ	5	4C	Z	S1

Characteristics of the courses of this group of Study Plan: Code=NC20160100_1 Name=obor Konstrukce pozemních staveb, volitelný projekt, 1. semestr

122P03C	Structural Design 3C	KZ	5
124P03C	Structural Design 3C	KZ	5
132P03C	Structural Design 3C	KZ	5
133P03C	Structural Design 3C	KZ	5
134P03C	Structural Design 3C	KZ	5

135P03C	Structural Design 3C	KZ	5
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Code of the group: NC20160200_1

Name of the group: obor Konstrukce pozemních staveb, volitelný projekt, 2. semestr

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

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

Credits in the group: 5

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
122P04C	Structural Design 4C Rostislav Šulc	KZ	5	4C	L	S1
124P04C	Structural Design 4C Tomáš Vlach, Tomáš Čejka, Radek Zigler, Jitka Vašková Radek Zigler Radek Zigler (Gar.)	KZ	5	4C	L	S1
132P04C	Structural Design 4C Bořek Patzák, Pavel Tesárek, Jan Zeman, Jan Vorel, Michal Šejnoha, Pavel Kuklík, Václav Nežerka, Martin Horák	KZ	5	4C	L	S1
133P04C	Structural Design 4C	KZ	5	4C	L	S1
134P04C	Structural Design 4C Martina Eliášová, Karel Mikeš, Anna Kuklíková, Michal Jandera, František Wald, Zdeněk Sokol, Robert Jára, Zbyněk Svoboda, Pavel Kopecký, Petr Kuklík Petr Kuklík (Gar.)	KZ	5	4C	L	S1
135P04C	Structural Design 4C Jan Salák	KZ	5	4C	L	S1
210P04C	Structural Design 4C Jiří Litoš Jiří Litoš Jiří Litoš (Gar.)	KZ	5	4C	L	S1
220P04C	Structural Design 4C Radek Vašíček	KZ	5	4C	L	S1

Characteristics of the courses of this group of Study Plan: Code=NC20160200_1 Name=obor Konstrukce pozemních staveb, volitelný projekt, 2. semestr

122P04C	Structural Design 4C	KZ	5
Focus on complex approach to practic design, analysis and optimalization of multi-storey or long-span building structures, or their reconstruction. Analysis of load, functional and technologic requirements, design of load-bearing system alternatives including foundations, preliminary bearing elements dimensions calculation, choice of most suitable version. Detailed static design of chosen version, calculation, technical report and drawings. Check of bearing and non-bearing structures interaction and assembly techniques. Public presentation.			
124P04C	Structural Design 4C	KZ	5
132P04C	Structural Design 4C	KZ	5
133P04C	Structural Design 4C	KZ	5
134P04C	Structural Design 4C	KZ	5
135P04C	Structural Design 4C	KZ	5
210P04C	Structural Design 4C	KZ	5
220P04C	Structural Design 4C	KZ	5

List of courses of this pass:

Code	Name of the course	Completion	Credits
101MA04	Mathematics 4	Z,ZK	5
101YMAV	Mathematics 4 - Selective Course	Z,ZK	5
101YMCD	Methods of Time Discretization	Z	2
101YMST	Mathematical statistics for technicians	Z	2
101YNUM	Numerical Methods	Z	2
102YFPL	Solid State Physics in Civil Engineering	Z	2
Solids, crystal structure, chemical bonds, electron microscopes, scanning tunneling microscope, atomic force microscope, diffraction, diffraction methods, semiconductors, p-n junction, photovoltaic effect, solar cells, heat and moisture transport.			
122DPM	Diploma Thesis	Z	30
122P03C	Structural Design 3C	KZ	5
122P04C	Structural Design 4C	KZ	5
Focus on complex approach to practic design, analysis and optimalization of multi-storey or long-span building structures, or their reconstruction. Analysis of load, functional and technologic requirements, design of load-bearing system alternatives including foundations, preliminary bearing elements dimensions calculation, choice of most suitable version.			

Detailed static design of chosen version, calculation, technical report and drawings. Check of bearing and non-bearing structures interaction and assembly techniques. Public presentation.			
122YTSD	Technology of Component Production	Z	2
123DPM	Diploma Thesis In accordance with the thesis proposal	Z	30
123YMPU	Materials for Surface Finishing of Building Constructions Estetical and protective function of the surface finishing. Types of the surface finishing. Design of the surface of the horizontal and vertical constructions. Materials for the surface finishing. Treatment of the underlayer. Technological requirements. Maintenance and repairing of the surface. Special finishing.	Z	2
124DPM	Diploma Thesis	Z	30
124P03C	Structural Design 3C	KZ	5
124P04C	Structural Design 4C	KZ	5
124PS03	Building Structures	Z,ZK	4
124YBM1	Building Information Modeling (BIM) for Building Structures 1	Z	4
124YDPH	Diagnosis and Surveying of Building Structures	Z	2
124YDRS	Timber Buildings	Z	2
124YDSR	Demolitions of Buildings and Material Recycling	Z	2
124YHVK	Long Span Structures	Z	2
124YIKS	Interaction of structures and parts of structures	Z	2
124YKSD	Complex Structural Detail	Z	2
124YPFS	Precast concrete structures	Z	2
124YRHS	Reconstruction of Historical Building Structures	Z	2
124YZUK	Loading Effects and their Impact on Building Structures Division of load from history-load point of view, loading effects and forced and non.forced influences. Occurrence-probability of individual load, combination of load, load- connection with the solution of civil engineering. Interaction of static and dynamic loading effects in specialization of building structures, interaction of shortterm and longterm effects of load. Computation models of load.	Z	2
126YBIM	Building Information Modelling - Fundamentals Subject deals with Building Information Modeling (BIM) topic as with the modern tool for management and operation of construction projects. It is oriented to handling basic relevant software (Autodesk Revit, Autodesk Navisworks) and especially to understanding meaning of BIM in current construction business and its future and importance in specific phases of construction projects.	Z	2
126YSP	Construction Cost Estimating Software	Z	2
132DPM	Diploma Thesis in accordance with the thesis proposal	Z	30
132DY01	Dynamics of structures 1 Principles of theory of vibration, dynamic loading. Free and forced vibration of single-degree-of-freedom systems. Damped vibration. Methods of dynamic analysis of multi-degreee-of-freedom systems.	Z,ZK	5
132EADC	Experimental Analysis and Diagnostics C	KZ	3
132NAK	Numerical Analysis of Structures	Z,ZK	5
132P03C	Structural Design 3C	KZ	5
132P04C	Structural Design 4C	KZ	5
132PRPM	Deformation and Failure of Materials Viscoelasticity, models for concrete creep and shrinkage. Theory of plasticity, principles of limit analysis. Fracture mechanics. Damage mechanics.	Z,ZK	5
132YMMO	Modern Methods of Optimization The course is aimed at an overview of numerical optimization methods applicable not only in the Civil Engineering area. The emphasis is put more on the introduction of driving principles, however, practical applications in MATLAB environment are also conducted during exercises.	Z	2
132YNA2	Numerical Analysis of Structures 2 Advanced course on finite element method. Formulation of plate elements suitable for thin and thick plates, plates on elastic foundation. Introduction to nonlinear problems: geometrical and material nonlinearity, solution methods, implementation aspects.	Z,ZK	4
132YNAK	Nonlinear Analysis of Materials and Structures Students acquaint self with the concepts of linear stability and calculation of elastoplastic load capacity. Linear stability - evaluation of the critical load and buckling shape. Analysis of structures according to the 2nd order theory - equilibrium conditions on a deformed structure, initial stress matrix. Elastoplastic analysis of structures - evaluation of the limit load capacity, distribution of internal forces at the limit state - static incremental method, kinematic method. Solving stability and elastoplasticity problems by means of a general-purpose finite element program.	Z	2
132YPM2	Computer Analysis of Structures 2 Limit state of frames. Stability analysis of structures. Second order theory. Beams and gridwork girders on elastic foundation. Plate and wall structures. Dynamic analysis of structures. Verification of results.	Z	2
132YSAK	Stability and Elasto-plastic Analysis of Structures Linear stability - determination of critical loading, determination of buckling shape. Analysis of structures according to the 2nd order theory - equilibrium on deformed structure, matrix of initial stresses. Elasto-plastic analysis of structures - determination of ultimate loading, determination of internal forces at ultimate limit state, determination of collaps shape at ultimate limit state - static incremental method, kinematic method.	Z	2
132YSSK	Reliability of Structures The course is devoted to the reliability of elements and systems. Element reliability is time dependent while the reliability of systems is of type strength-load. Complicated cases are solved by the FORM method. Two simulation methods are introduced: Monte Carlo and LHS.	Z	2
133B03C	Concrete Structures 3C Extension of knowledge in the field of design of reinforced concrete structures, when the emphasis is put on development of engineering sense. Within the scope of this subject, the student acquires ability to estimate arrangement of reinforcement in RC slabs of general shape, ability to define basic strut-and-tie models for given structural details, ability to provide optimum reinforcement at general point of RC slabs and RC walls based on normal forces distributions obtained with common engineering software. Also, the student learns the basic principles plastic design of RC structures and design of RC foundations.	Z,ZK	5

133B04C	Concrete Structures 4C Extension of knowledge in the field of design of reinforced concrete structures, when the emphasis is put on development of engineering sense. Within the scope of this subject, the student acquires ability to estimate arrangement of reinforcement in RC slabs of general shape, ability to define basic strut-and-tie models for given structural details, ability to provide optimum reinforcement at general point of RC slabs and RC walls based on normal forces distributions obtained with common engineering software. Also, the student learns the basic principles plastic design of RC structures and design of RC foundations.	Z,ZK	5
133DPM	Diploma Thesis in accordance with a thesis proposal	Z	30
133P03C	Structural Design 3C	KZ	5
133P04C	Structural Design 4C	KZ	5
133YATK	Applied Theory of Structures	Z,ZK	4
133YBEX	Concrete under severe conditions	Z	2
133YMVB	Structural Models and Reinforcing of Concrete Members	Z	2
133YPNB	Fire design of concrete and masonry structures Fire design of concrete structures. Nominal and parametric fire exposures. Verification methods of fire resistance. Mechanical, thermal and physical properties of concrete and steel at elevated temperatures. Design procedures: tabulated data or testing, simplified calculation methods, advanced calculation methods. Shear torsion and anchorage of reinforcement. Spalling of concrete. Addition rules for high strength concrete. Calculation of fire design of concrete and masonry structures.	Z	2
133YPRK	Failures and Rehabilitation of Concrete Structures	Z	2
133YVHB	High-performance Concretes Various types of high-performance concretes - their behaviour and properties. Design and analysis. Examples of practical application of high-performance concretes.	Z	2
134DK02	Timber Structures 2	Z,ZK	4
134DPM	Diploma Thesis	Z	30
134O02C	Steel Structures 2C Deepening of knowledge received from courses 133NNK and 134OK01. Amplifying of theoretical knowledge in the field of steel grade selection, toughness, global analysis of structures, buckling of structural systems, joint classification, and high strength steel and demanding composite steel and concrete structures. Complementation of knowledge from fire resistance of steel and composite structures and detailed design of industrial buildings and crane girders. Design of masts, towers, chimneys, tanks, silos and pipelines, technological structures, pre-stressed steel structures and basis of design from aluminium alloys and stainless steel, and cable and membrane structures.	Z,ZK	4
134P03C	Structural Design 3C	KZ	5
134P04C	Structural Design 4C	KZ	5
134YDKM	Timber structures and bridges Timber structures focused to national strategy of sustainable development. New timber-based materials. Structural systems of houses and bridges. Repairing and strengthening. Fire design. Production, protection, erection and maintenance. Design and evaluation of bridges, roofs structures in normal temperature and in fire.	Z	2
134YHMK	Stainless steel and aluminium structures Subject YHMK covers two parts: the first concerns design of structures from aluminium alloys, the second deals with stainless steel structures. The first part covers introduction and practice in designing of aluminium structures. The second part covers evolution of stainless steel materials/structures and examples of realized structures. Stainless steels suitable for structures are described in a detail, including their properties. Dissimilarities in assessments of members under common loadings with respect to low-carbon steels is described for both ultimate and serviceability limit states. In the end the possibilities concerning connections of stainless steel members, erection and installation of stainless steel members are described.	Z	2
134YNDK	Load-bearing timber roof constructions	Z	2
134YPOD	Fire Resistance of Steel and Timber Structures The class gives introduction to fire modeling, fire safety and fire resistance of steel, steel-concrete composite and timber structural elements.	Z	2
134YROK	Extending the Life of Steel and Timber Structures	Z	2
134YSDO	Connections of steel and timber structures The subject allows insight and ability to apply the knowledge related to structural connections and its application by software.	Z,ZK	4
134YSKO	Special steel structures The course follows the basic education in the field of steel structures. It focuses on a design of some special construction types, includes parts: High-strength steel construction, Crane supporting structures, Silos and Rope structures.	Z,ZK	4
134YSMK	Stability and modelling of steel structures Subject YSMK covers two parts. The first one deals with stability and strength of steel plates, the second one with stability and strengths of steel frame structures. In the first part the historic collapses of steel structures are analysed including the importance of imperfections for a design of thin plated structures. Presented are principles of theory of buckling, linear and nonlinear theory of buckling of thin plates. The results are applied to the 4th class cross sections in harmony with Eurocode. Buckling due to normal, shear and local loadings including their combination is analysed in a detail. In the end the application of the results is shown together with design of necessary stiffeners. The second part is focused on member and structure stability. Possible global analysis methods are presented together with methods for compression and bending interaction for slender members. In detail, specific cases of lateral torsional buckling are explained including also tapered members.	Z	2
135DPM	Diploma Thesis Individual assignment in accordance with the thesis proposal	Z	30
135P03C	Structural Design 3C	KZ	5
135P04C	Structural Design 4C	KZ	5
135YGSM	Geotechnical software for numerical models	Z	2
135YING	Engineering geology Elements of conceptions of engineering geology and hydrogeology, methods of investigation in engineering geology, maps in geology and engineering geology.	Z	2
135YTIG	Field training in engineering geology	Z	2
135YVPZ	Computer analysis in underground structures Numerical methods in CAD/CAM in geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical software both in the field of conventional methods and in numerical modelling domain. Practical solutions of selected geotechnical problems.	Z	2
135ZS02	Foundations 2	Z,ZK	4
210DPM	Diploma Thesis	Z	30
210P04C	Structural Design 4C	KZ	5
210YDSM	Diagnostics of Building Materials Properties	Z	2

220DPM	Diploma Thesis Diploma thesis elaboration with possible use of geotechnical laboratory and underground facility the Josef underground laboratory (http://ceg.fsv.cvut.cz).	Z	30
220P04C	Structural Design 4C	KZ	5

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

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