Study plan

Name of study plan: Stavební inženýrství - pozemní stavby, specializace Statika pozemních staveb

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Civil Engineering - Building 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: platí pro nástup od akad. roku 2023/24

Name of the block: Compulsory courses Minimal number of credits of the block: 42

The role of the block: Z

Code of the group: NC20230102

Name of the group: Statika pozemních staveb, 1. semestr

Requirement credits in the group: In this group you have to gain at least 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
101MAPS	Mathematics PS Michal Zdražil, Jana Nosková, Iva Malechová, Jozef Bobok Jana Nosková Jana Nosková (Gar.)	Z,ZK	3	2P+1C	Z	Z
124PS4C	Building Structures 4 Vladimír Žďára, Hana Gattermayerová, Tomáš Čejka, Ctislav Fiala Vladimír Žďára Vladimír Žďára (Gar.)	Z,ZK	4	2P+2C	Z	Z
132NAK	Numerical Analysis of Structures Bořek Patzák, Martin Horák Bořek Patzák Bořek Patzák (Gar.)	Z,ZK	5	2P+2C	Z	Z
133B03C	Concrete Structures 3C Jan Vítek, Lukáš Vráblík, Jan Kubát, Jan Vesecký Lukáš Vráblík Jan Vítek (Gar.)	Z,ZK	5	2P+2C	Z	Z
134O02C	Steel Structures 2C Martina Eliášová Martina Eliášová (Gar.)	Z,ZK	4	2P+2C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=NC20230102 Name=Statika pozemních staveb, 1. semestr

		,	
101MAPS	Mathematics PS	Z,ZK	3
Focused on basic a	nd more advanced statistical and probabilistic methods of data analysis as well as on hypothesis testing and regression.		
124PS4C	Building Structures 4	Z,ZK	4
132NAK	Numerical Analysis of Structures	Z,ZK	5
Variational principle	s of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric	elements, area co	oordinates,
numerical integration	n. Application of method to selected 1D and 2D problems (Elasticity, heat transfer, consolidation). Algorithmic aspects of the me	thod.	
133B03C	Concrete Structures 3C	Z,ZK	5
Extension of knowle	edge in the design of prestressed concrete structures. Introduction to special hybrid and thin-walled structures. Modern materials	and design solution	ns for the future.
134O02C	Steel Structures 2C	Z,ZK	4
Deepening of know	edge received from courses 133NNK and 1340K01. Amplifying of theoretical knowledge in the field of steel grade selection, tough	nness, global analy	sis of structures,
buckling of structure	al systems, joint classification, and high strength steel and demanding composite steel and concrete structures. Complementation	n of knowledge fro	m fire resistance
of steel and compo	site structures and detailed design of industrial buildings and crane girders. Design of masts, towers, chimneys, tanks, silos and	pipelines, technolo	gical structures

Code of the group: NC20230202

Name of the group: Statika pozemních staveb, 2. semestr

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

pre-stressed steel structures and basis of design from aluminium alloys and stainless steel, and cable and membrane structures.

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
135ZS02	Foundations 2 Jan Masopust	Z,ZK	4	2P+2C	٦	Z
132DY01	Dynamics of structures 1 Jiří Máca	Z,ZK	5	2P+2C	٦	Z
132EADC	Experimental Analysis and Diagnostics C Michal Polák	KZ	3	1P+2C	L	Z
133B04C	Concrete Structures 4C Petr Štemberk	Z,ZK	5	2P+2C	L	Z
134DK02	Timber Structures 2 Jakub Dolejš	Z,ZK	4	2P+1C	L	Z

Characteristics	of the courses of this group of Study Plan: Code=NC20230202 Name=Statika pozemních sta	veb, 2. semes	tr
135ZS02	Foundations 2	Z,ZK	4
The course deepens	the knowledge from the previous course ZS1. It covers design principles, risks associated with the foundation of structures, de	eper design of flat	foundations,
deeper design of de	ep foundations, negative casing friction of drilled piles, grouting (calculations and execution), construction pits, improvement of f	oundation soils.	
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 dyr	namic analysis of	
muti-degreee-of-free	eedom systems.		
132EADC	Experimental Analysis and Diagnostics C	KZ	3
Experiments focuse	d on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnos	tics of building and	dengineering
structures, tests car	ried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, w	vind tunnel simulati	ons of wind
effects, static load to	ests on physical models), monitoring of building and engineering structures, static load tests (building structures, engineering str	uctures, bridges), o	dynamic load
tests and experimen	ital modal analysis (building structures, engineering structures, bridges, footbridges), effects of technical seismicity, evaluation o	f adverse effects of	f vibration on
the human body, as	sessment of the influence of building vibrations on installed machines and devices).		
133B04C	Concrete Structures 4C	Z,ZK	5
Extension of knowle	dge in the field of design of reinforced concrete structures, when the emphasis is put on development of engineering sense. Wit	hin the scope of th	is subject, the
student acquires ab	lity to estimate arrangement of reinforcement in RC slabs of general shape, ability to define basic strut-and-tie models for given	structural details, a	ability to provid
optimum reinforcem	ent at general point of RC slabs and RC walls based on normal forces distributions obtained with common engineering software	. Also, the student	learns the basi
principles plastic de	sign of RC structures and design of RC foundations.		
134DK02	Timber Structures 2	Z,ZK	4
Lectures on a desig	n of timber elements and structures - static action, choice of computational models and methods, design of details and joints, fir	e resistance	

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 8

The role of the block: PV

Code of the group: NC20230102_2

Name of the group: Statika pozemních staveb, PV předměty, 1. semestr

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

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

Credits in the group: 4

V případě splnění některého předmětu v bakalářském studiu nelze tento předmět Note on the group: zapsat znovu.

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 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,L	PV
124YADO	Acoustics and Daylighting of Buildings Jaroslav Vychytil, Jiří Nováček Jiří Nováček Jaroslav Vychytil (Gar.)	Z	2	1P+1C	Z	PV
124YCPV	The Principles of Circular Economy in Building Construction Tereza Pavlů Tereza Pavlů Tereza Pavlů (Gar.)	Z	2	1P+1C	Z	PV
124YDPH	Diagnosis and Surveying of Building Structures Eva Burgetová Eva Burgetová (Gar.)	Z	2	1P+1C	Z	PV
124YDSR	Demolitions of Buildings and Material Recycling Šárka Šilarová, Zuzana Rácová Šárka Šilarová Šárka Šilarová (Gar.)	Z	2	1P+1C	Z	PV
124YPBS	Principles of Building Fire Safety Vladimír Mózer Vladimír Mózer Vladimír Mózer (Gar.)	ZK	2	1P+1C	Z	PV

124YPRS	Failures, Deterioration, Renovations Radek Zigler Radek Zigler (Gar.)	Z	2	1P+1C	Z	PV
125OZE1	Renewable Energy Sources Michal Kabrhel Michal Kabrhel (Gar.)	ZK	3	2P	Z,L	PV
132PRPM	Deformation and Failure of Materials Milan Jirásek, Petr Havlásek, Lenka Dohnalová Milan Jirásek Milan Jirásek (Gar.)	Z,ZK	5	2P+2C	Z	PV
132YKPA	Statics for Architecture Aleš Jíra	Z	2	1P+1C	Z,L	PV
132YMMO	Modern Methods of Optimization Matéj Lepš, Jan Zeman Matěj Lepš Matěj Lepš (Gar.)	Z	2	1P+1C	Z	PV
132YSEI	Seismic Engineeering Jiří Máca Jiří Máca Jiří Máca (Gar.)	Z	2	1P+1C	Z	PV
132YSSK	Reliability of Structures Jaroslav Kruis Jaroslav Kruis (Gar.)	Z	2	1P+1C	Z	PV
133YBEX	Concrete under Extreme Conditions Radek Štefan	Z	2	1P+1C	Z	PV
133YPRK	Failures and Rehabilitation of Concrete Structures Petr Štemberk, Jakub Žák Petr Štemberk Petr Štemberk (Gar.)	Z	2	1P+1C	Z	PV
134YDKM	Timber structures and bridges Anna Kuklíková Anna Kuklíková (Gar.)	Z	2	1P+1C	Z	PV
134YROK	Extending the Life of Steel and Timber Structures Karel Mikeš Karel Mikeš (Gar.)	Z	2	1P+1C	Z	PV
134YSMK	Stability and modelling of steel structures Michal Jandera Michal Jandera Michal Jandera (Gar.)	Z	2	1P+1C	Z	PV
135YGSM	Geotechnical Software for Numerical modelling Daniel Turanský, Jan Ježek, Jan Salák, Alena Zemanová Alena Zemanová Alena Zemanová (Gar.)	Z	2	1P+1C	Z	PV
210YDSM	Diagnostics of Building Materials Properties Jiří Litoš, Petr Konrád, Přemysl Kheml Jiří Litoš Jiří Litoš (Gar.)	Z	2	1P+1C	Z	PV
210YSB	Special Concretes Pavel Reiterman, Vendula Kellnerová Pavel Reiterman Pavel Reiterman (Gar.)	Z	2	2P	Z,L	PV

Characteristics of the courses of this group of Study Plan: Code=NC20230102_2 Name=Statika pozemních staveb, PV předměty, 1. semestr

Solid State Physics in Civil Engineering

102YFPL

Solids, crystal struct	ture, atomic shell theory, valence layer chemical bonds, dislocation disturbances, critical crack energy,vibration of masses, syste		ction diffraction
•	on, basics concepts of fracture mechanics, types of fracture, electron microscopes, scanning tunneling microscope, atomic force	microscope, diffra	olion, almaolion
	uctors, p-n junction, photovoltaic effect, solar cells, heat and moisture transport.		
122YTSD	Technology of Component Production	Z	2
124YADO	Acoustics and Daylighting of Buildings	Z	2
The course focuses	on a more detailed explanation and practice of selected topics in the field of daylighting and building acoustics that students may	encounter in future	design practice.
124YCPV	The Principles of Circular Economy in Building Construction	Z	2
124YDPH	Diagnosis and Surveying of Building Structures	Z	2
Course sets out key	considerations and implications which require structure assessment. The course provides an objective framework and methodic	cal and systematic	approach to
, , ,	I diagnosis, preliminary and comprehensive survey, visual inspection, site inspections, laboratory tests, investigation kits, types of ficance, criticality, reason for failures case studies)	f defects and dama	iges, symptoms,
124YDSR	Demolitions of Buildings and Material Recycling	Z	2
The use of construct	tion waste from demolitions from the production of building materials and from other sectors in the construction industry with the	e aim of: significan	tly reducing the
volumes of landfilled	d materials, reducing the consumption of primary raw materials, a new perspective on the design of buildings and structures in a	accordance with a	closed life cycle.
Legislation, levels of	f recycling in developed countries, recycling in CR, possibilities of recycling buildings and structures, design of structures from th	he point of view of	sustainable
_	nization of landfills, examples and demonstrations of recycling technologies, low-waste technologies		
_	principles of Building Fire Safety	ZK	2
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development, minim 124YPBS The course is focuse safety design that are enable them to take 124YPRS The course is focuse degradation and agir and historical survey 125OZE1 Renewable sources The course therefore 132PRPM Viscoelasticity, mode 132YKPA 132YMMO The course is aimed	Principles of Building Fire Safety ed on the presentation and acquisition of the most important concepts and principles of fire safety in buildings. Attention is paid re important for the protection of life and health, property, the environment and other assets. The course is intended for students into account aspects of fire safety from the initial stages of project preparation of buildings. Failures, Deterioration, Renovations ed on the current issue of restoration, reconstruction and modernization of buildings (residential, industrial, etc.), on historical str ng of structures and materials of historical buildings, their residual life and failures of historical buildings and their parts. An integral pa ys, diagnostics and assessment of the structural-technical condition and remaining service life. Renewable Energy Sources are becoming increasingly important sources of energy for buildings. Understanding their characteristics is key to the proper desi- e looks in detail at renewable sources and their applications. Deformation and Failure of Materials els for concrete creep. Theory of plasticity, principles of limit and incremental analysis. Fracture mechanics. Damage mechanics. Statics for Architecture Modern Methods of Optimization I at an overview of numerical optimization methods applicable not only in the Civil Engineering area. The emphasis is put more on the	to all the main consort of non-fire discipling of non-fire discipling and mater art is the issue of stream and operation of the stream of the	ponents of fire nes and should 2 ials, the issue of uctural-technical 3 f these systems. 5

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. 133YBEX Concrete under Extreme Conditions Ζ 2 The course is focused on concrete and concrete structures under extreme conditions. 133YPRK Failures and Rehabilitation of Concrete Structures Z 2 The course focuses on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measures. Methods of strengthening existing concrete structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of bending moment and shear, and foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. 134YDKM Timber structures and bridges Timber structures focused to national strategy of sustainable development. New timber-based materials. Structural systeme of houses and bridges. Repairing and strengthtening. Fire design. Production, protection, erection and maintenance. Design and evaluation of bridges, roofs structures in normal temperature and in fire. Extending the Life of Steel and Timber Structures 134YROK 2 Materials used for bearing structures. Developments in the area of regulations and standardization. Causes of defects, malfunctions, survey of objects, static assumptions of reconstruction. Possibilities of strengthening, strengthening of steel and timber structures and strengthening of connections. Using of computers in reconstructions and development of numerical models Stability and modelling of steel structures 134YSMK 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. Geotechnical Software for Numerical modelling Students get acquainted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introducing the basic principles of the Finite Element Method and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite elements used in geotechnical applications, material models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. This knowledge is further applied in the modeling of foundation, embedded walls, and stability problems. 210YDSM Diagnostics of Building Materials Properties Failures of building materials, mechanical, thermal, chemical and other influences on the development of failures of building materials. Diagnostics of their occurrence. Basics of experimental measurement and instrumentation of tested elements and structures. Theory of experiment, measurement and processing of results. Testing machines and equipment. Deformation measuring instruments. Destructive testing of mechanical properties. Non-destructive test methods. Test methodology for various materials (concrete, mortar, metallic elements, wood, glass, plastics, composites and others). 210YSB **Special Concretes** Ζ 2 This course is aimed at expanding knowledge in the field of special concretes and composites for specific applications. The core of the course is to acquaint students with both the technological aspects of the production, testing and use of special concretes, as well as the applicable legislative framework for individual types of special concretes. Specific practical applications and experiences are also presented within the course. Code of the group: NC20230202 2 Name of the group: Statika pozemních staveb, PV předměty, 2. semestr Requirement credits in the group: In this group you have to gain at least 4 credits Requirement courses in the group: In this group you have to complete at least 1 course

Credits in the group: 4

Note on the group:

V případě splnění některého předmětu v bakalářském studiu nelze tento předmět

	Name of the course / Name of the group of courses					
Code	(in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
101YFAV	Introduction to Functional Analysis and Variational Methods Jozef Bobok, Zdeněk Skalák	KZ	2	1P+1C	Z,L	PV
101YMCD	Methods of Time Discretization	Z	2	1P+1C	L	PV
101YMST	Mathematical statistics for technicians Jana Nosková	Z	2	1P+1C	L	PV
101YNUM	Numerical Methods	Z	2	1P+1C	L	PV
123YMPU	Materials for Coatings	Z	2	1P+1C	L	PV
124YHVK	Long Span Structures Vladimir Žďára	Z	2	1P+1C	L	PV
124YKHK	Building Quality Complex Assessment	Z	2	1P+1C	L	PV
124YMOB	Modelling of Buildings - BIM	Z	2	1P+1C	L	PV
124YPFS	Precast concrete structures Radek Zigler	Z	2	1P+1C	L	PV
124YPS5	Prefabricated structures Tomáš Čejka	Z	2	1P+1C	L	PV
124YRHS	Reconstruction of Historical Building Structures Jiří Witzany	Z	2	1P+1C	L	PV
125YTCH	Technological Equipment of Buildings	Z	2	2P	L	PV
126YBVE	BIM in Public Investments	Z	2	2P	L	PV

126YPDV	Development Project	Z	2	2C	L	PV
132YNAK	Nonlinear Analysis of Materials and Structures	Z	2	1P+1C	L	PV
132YNA2	Numerical Analysis of Structures 2 Bořek Patzák	Z,ZK	4	2P+1C	L	PV
132YPM2	Computer Analysis of Structures 2 Jiří Máca	Z	2	1P+1C	L	PV
132YSHK	Statics and Reconstruction of Historical Structures Petr Fajman	Z	2	1P+1C	L	PV
132YUPM	General Principles of Mechanics Milan Jirásek	Z,ZK	4	2P+1C	L	PV
133YATK	Applied Theory of Structures Lukáš Vráblík	Z,ZK	4	2P+1C	L	PV
133YMVB	Concrete and Masonry Structures 1 Petr Bílý	Z	2	1P+1C	L	PV
133YPNB	Fire desgn og concrete and mnsory structures Radek Štefan	Z	2	1P+1C	L	PV
133YVHB	Ultrahigh Performance Concretes Josef Fládr	Z	2	1P+1C	L	PV
134YHNK	Stainless steel and aluminium structures František Wald	Z	2	1P+1C	L	PV
134YNDK	Load-bearing timber roof constructions Karel Mikeš	Z	2	1P+1C	L	PV
134YNSK	Design of Glass Structures Martina Eliášová	Z,ZK	2	1P+1C	L	PV
134YPMK	Design of Membrane Structures	Z	2	1P+1C	L	PV
134YPOD	Fire Resistance of Steel and Timber Structures Zdeněk Sokol	Z	2	1P+1C	L	PV
134YSOD	Connections of steel and timber structures Robert Jára	Z	2	1P+1C	L	PV
134YSOK	Special steel structures Jakub Dolejš	Z	2	1P+1C	L	PV
135YVPZ	Computer analysis in underground structures Jan Pruška	Z	2	1P+1C	L	PV

Characteristics of the courses of this group of Study Plan: Code=NC20230202_2 Name=Statika pozemních staveb, PV předměty, 2. semestr

101YFAV	Introduction to Functional Analysis and Variational Methods	KZ	2
101YMCD	Methods of Time Discretization	Z	2
The course is devote	d to a universal and very effective method for solving problems involving time, the so-called evolutionary problems, especially fo	r partial differenti	al equations with
a time variable. This	nethod represents a modern approach to modeling and solving engineering tasks. These problems, both linear and non-linear,	model events in m	nany engineering
fields, such as heat o	onduction, oscillations, also in rheology and other parts.		
101YMST	Mathematical statistics for technicians	Z	2
Inferential statistics.	heory of probability. Random variables and its characteristics. Basic methods of mathematical statistics.	ı	!
101YNUM	Numerical Methods	Z	2
Numerical computing	in applied mathematics: course for beginners.	ı	
123YMPU	Materials for Coatings	Z	2
Students will gain an	overview of how to protect building structures from corrosion and other harmful influences such as UV radiation, acid rain, etc.	Students will also	learn about
methods and technol	ogies of surface treatment. The course consists of 6 lectures and 6 exercises. In the lectures, students will learn about both histo	rical and more imp	ortantly modern
surface treatments fo	r different types of structures. In the exercises, students will perform a surface treatment on a fragment of a structure and will b	e able to check th	e quality of the
work done by themse	elves in the last exercise by means of a tear-off test.		
124YHVK	Long Span Structures	Z	2
The subject deals wit	n the analysis of structural solutions applied in building designs by the world's best architects. Although attention will be focused ma	inly on the solutio	n of load-bearing
structures, we will als	o pay attention to the wider context of the design. Reading existing constructions is a natural way to learn the principles of their	design. And natur	ally we will learn
from the best. An ext	ensive database of completed buildings, including more than 5,000 buildings, will enable us to take a trip into history and the pr	esent on all the w	orld's continents.
124YKHK	Building Quality Complex Assessment	Z	2
Students will gain an	overview of design strategies in green architecture and sustainable building and learn how to conduct assessments to achieve	high quality build	ings. In addition,
they will learn basic i	nformation on life cycle assessment of materials and buildings.		
124YMOB	Modelling of Buildings - BIM	Z	2
The course is design	ed to introduce the phenomenon of parametric design, which is becoming very widespread in today's world. It is the connection	of 3D models an	d BIM models
with visual programm	ing. Instead of writing code in a classical programming language, Nodes are connected, and the resulting script can be created	d visually and with	out knowledge
	anguage. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structui		-
optimization. Themat	cally, the course covers two main areas of parametric modeling, replicating two software platforms: Revit + Dynamo (JaVe) Rh	no + Grasshoppe	r (ZdMa)
124YPFS	Precast concrete structures	Z	2
Residential houses n	nade of precast conrete panels, of which approx. 82 thousand were built in the period 1960-1995 do not meet the required exte	nt of the current d	ynamically
developing society a	nd in many cases require the implementation of regeneration and modernization interventions enabling their full use. The cours	e is focused on th	e current issues
	ction and modernization of precast houses, modernization of apartments in precast houses, on the issue of freeing parterres of p		
	s, etc. Renovation, modernization, or regenerations require the removal of functionally inadequate completion structures, techr		
· ·	demanding interventions in supporting structures. As part of the construction of communication networks, modernization of urban	•	
	ry out partial or complete demolition of a precast panel building. As part of the regeneration of precast panel housing estates, a		
	t houses. The implementation of the mentioned plans requires a survey and diagnostics of supporting and peripheral structures	, joints of parts a	nd an evaluation
	nical condition and an assessment of the residual life of precast panel structures and buildings.		1
124YPS5	Prefabricated structures	Z	2

124YRHS	Reconstruction of Historical Building Structures	Z	2
· · · · · · · · · · · · · · · · · · ·	econd half of the 19th century by 1960, more than 250 thousand of two- to five-story brick apartment (mainly rental) houses in		
	h Republic. Brick buildings from this period were built according to regulations, building codes and laws from the turn of the 19 do not meet the current thermal, acoustic and other requirements, the requirements of a dynamically developing society to th		•
	ion and modernization interventions, including the replacement of non-compliant and out-of-date structures and equipment en	-	=
· -	issue of renewal, reconstruction and modernization of brick multi-storey rental apartment buildings, on historical structures and	-	
	and materials of historic brick residential buildings, their residual life, failures and reconstruction of historical buildings and th	-	
	of improving the well-being of the internal environment, the replacement of finishing structures, opening fillings, etc. as an int	egral part of the r	nodernization of
these buildings. 125YTCH	Taghnalogical Equipment of Buildings	Z	2
	Technological Equipment of Buildings en technology, elevators, technology swimming pools, heat pumps, heat source and technological system, technology cooling		l
126YBVE	BIM in Public Investments	Z	2
126YPDV	Development Project	Z	2
132YNAK	Nonlinear Analysis of Materials and Structures	7	2
	ainted with the concepts of linear stability and calculation of elastoplastic load capacity. Linear stability - evaluation of the criti	cal load and buck	l
-	ccording to the 2nd order theory - equilibrium conditions on a deformed structure, initial stress matrix. Elastoplastic analysis of		
	n of internal forces at the limit state - static incremental method, kinematic method. Solving stability and elastoplasticity probler	ns by means of a	general-purpose
finite element program.	Nivers suited Amelysis of Characterises O	7 71/	4
132YNA2	Numerical Analysis of Structures 2 te element method. Formulation of plate elements suitable for thin and thick plates, plates on elastic foundation. Introduction to	Z,ZK	4
	y, solution methods, implementation aspects.	o nominear proble	erris. geometricai
132YPM2	Computer Analysis of Structures 2	Z	2
	ability analysis of structures. Second order theory. Beams and gridwork girders on elastic foundation. Plate and wall structure	s. Dynamic analy	sis of structures.
Verification of results.			
132YSHK	Statics and Reconstruction of Historical Structures	Z	2
	ical vaults and roof trusses. Static behaviour and most frequent causes of failure. Methods of reconstruction, changes in four	ndation conditions	included. Most
· ·	re of panel buildings. Visit to the historical part of Prague Castle.	7 71/	4
132YUPM	General Principles of Mechanics rators and their application in mechanics, Gauss and Green theorems. General structure of the basic equations of linear and	Z,ZK	
	al work (power), variational principles (Lagrange, Castigliano, Hellinger-Reissner, Hu-Washizu) and their application to contin		
	walls and three-dimensional bodies.		
133YATK	Applied Theory of Structures	Z,ZK	4
Detailed introduction to t	heoretical approaches to the effects of creep and shrinkage on structures. Principles of time-dependent analysis. Methods for t	he analysis of thin	-walled concrete
structures, stability theo	•		
133YMVB	Concrete and Masonry Structures 1	Z	2
	ect will be selected problems from the following areas: Reinforcement of discontinuities of reinforced concrete structures. Intro ctures. Preparation of input data for numerical models. Design of structures using MATLAB. Presentation of selected progran		_
structures.	ources. I repartation of input data for numerical models. Design of structures daining with End. I resontation of selected program	no for the design	or correte
133YPNB	Fire desgn og concrete and mnsory structures	Z	2
The course is focused o	n fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal	analysis, loads, d	lesign principles,
	al properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures.		
133YVHB	Ultrahigh Performance Concretes	Z	2
	s to present a special type of concrete that achieves great strength and high durability, which enables the realization of very t		•
	ete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devo he composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the	· ·	_
theoretical knowledge in		olddorno odir oxp	
134YHNK	Stainless steel and aluminium structures	Z	2
Subject YHNK covers tw	o parts: the first concerns design of structures from aluminium alloys, the second deals with stainless steel structures. Structure	s of aluminium al	loys: Introduction
	g of aluminium structures. Structures of stainless steel: Evolution of stainless steel materials/structures and examples of real		
	re described in a detail, including their properties. Dissimilarities in assessments of members under common loadings with re-	· · ·	
members are described	ate and serviceability limit states. In the end the possibilities concerning connections of stainless steel members, erection an	a installation of si	ainiess steei
134YNDK	Load-bearing timber roof constructions	Z	2
	es. Creation of numerical models for assessment of internal forces and deformations for main different roof systems and struct		l
=	ndividual elements and their design. Historic structures and their reconstruction. Designing typical structural details based or	=	
also using modern meth	nods of joining elements of timber structures.		
134YNSK	Design of Glass Structures	Z,ZK	2
· ·	for students of the master's program Civil Engineering, deepens the knowledge acquired in the subject 134YNKS. Extension		-
	beams, columns and walls. Principles of designing structural elements made of glass according to normative documents, ex ty glass, use of software support for designing.	perimental verific	ation of material
134YPMK	Design of Membrane Structures	Z	2
134YPOD	Fire Resistance of Steel and Timber Structures	Z	2
	tion to fire modeling, fire safety and fire resistance of steel, steel-concrete composite and timber structural elements.	_	_
134YSOD	Connections of steel and timber structures	Z	2
The subject allows insig	ht and ability to apply the knowledge related to structural connections and its application by software.		I
134YSOK	Special steel structures	Z	2
	ures - actions, design, detailing. Silos - actions, behaviour, silos with rigid and non-rigid section. Masts - division, detiling, des	sign. Cable roofs	procedure of
calculation.		_	
135YVPZ	Computer analysis in underground structures	Z coftware both in t	bo field of
	AD/CAM in geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical nd in numerical modelling domain. Practical solutions of selected geotechnical problems.	Sullware Doth in 1	THE HEID OF
Someonional methods a			

Name of the block: Povinně volitelné předměty, doporučení S1

Minimal number of credits of the block: 40

The role of the block: S1

Code of the group: NC20230102_1

Name of the group: Statika pozemních staveb, projekt, 1. semestr

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

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

Credits in the group: 5 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
132P03C	Structural Design 3C Jan Zeman, Václav Nežerka, Jiří Němeček, Aleš Jíra, Pavel Tesárek, Michal Šejnoha, Petr Kabele, Jan Sýkora, Michael Somr Aleš Jíra	KZ	5	4C	Z	S1
133P03C	Structural Design 3C Iva Broukalová Jitka Vašková (Gar.)	KZ	5	4C	Z	S1
134P03C	Structural Design 3C Michal Jandera Michal Jandera (Gar.)	KZ	5	4C	Z	S1
135P03C	Structural Design 3C Jan Salák, Jan Pruška, Jan Kos Jan Pruška	KZ	5	4C	Z	S1

Characteristics of the courses of this group of Study Plan: Code=NC20230102_1 Name=Statika pozemních staveb, projekt, 1. semestr

132P03C	Structural Design 3C	KZ	5
Students develop individ	ual projects under supervision of teachers from the Department of Mechanics. Project topics are presented at the departme	nt website. Studer	nts may propose
own topics - in this case	s, suitability of the topic and feasibility of the project will be evaluated by the project supervisor.		
133P03C	Structural Design 3C	KZ	5

The subject is focused on concrete and masonry structures. The assignment can be: elaboration of the structural design documentation, the analysis of the given problem requiring subject matter search and literature retrieval, the numerical analysis of the selected element or part of the structure, the preparation, execution and evaluation of experiments, etc. Collaboration of several students on one assignments is also possible. Consultation with participating departments K124 and K135 is not mandatory for all students. The extent of outputs depends on the type of assignment and the decision of the leading teacher.

outputo aoponao on tho	type of addignitions and the decidion of the locating toderion.		
134P03C	Structural Design 3C	KZ	5
Design of steel / timber	load bearing building structure according to external requirements in relation to interaction of load bearing and final completic	on structural elem	ents. The project
is assigned by the semi	nar leader.		

135P03C | Structural Design 3C | KZ | 5
Design, static calculation and drawing documentation of the building substructure

Code of the group: NC20230202 1

Name of the group: Statika pozemních staveb, projekt, 2. semestr

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

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

Credits in the group: 5

Note on the group:

13xP04C Projekt 4C

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
132P04C	Structural Design 4C Aleš Jíra	KZ	5	4C	L	S1
133P04C	Structural Design 4C Jitka Vašková	KZ	5	4C	L	S1
134P04C	Structural Design 4C Michal Jandera	KZ	5	4C	L	S1
135P04C	Structural Design 4C Jan Pruška	KZ	5	4C	L	S1

Characteristics of the courses of this group of Study Plan: Code=NC20230202_1 Name=Statika pozemních staveb, projekt, 2. semestr 132P04C | Structural Design 4C | KZ | 5

132P04C | Structural Design 4C | KZ | 5 | Students develop individual projects under supervision of teachers from the Department of Mechanics. Project topics are presented at the department website. Students may propose own topics - in this case, suitability of the topic and feasibility of the project will be evaluated by the project supervisor.

133P04C Structural Design 4C
The subject is focused on concrete and masonry structures. The assignment can be: elaboration of the structural design documentation, the analysis of the given problem requiring

subject matter search and literature retrieval, the numerical analysis of the selected element or part of the structure, the preparation, execution and evaluation of experiments, etc. Collaboration of several students on one assignments is also possible. Consultation with participating departments K124 and K135 is not mandatory for all students. The extent of outputs depends on the type of assignment and the decision of the leading teacher.

134P04C	Structural Design 4C	KZ	5
Design of steel / timber	on structural elem	ents. The project	
is assigned by the semi	nar leader.		
135P04C	Structural Design 4C	KZ	5
Design, static calculation	n and drawing documentation of the building substructure		

Code of the group: NC20230300

Name of the group: Stavební inženýrství - pozemní stavby, diplomová práce

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 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
124DPM	Diploma Thesis Tomáš Čejka, Tomáš Vlach, Martin Jiránek, Jiří Pazderka, Kateřina Mertenová, Marek Pokorný Jiří Pazderka Jiří Pazderka (Gar.)	Z	30	24C	Z	S1
132DPM	Diploma Thesis Bořek Patzák, Martin Horák, Milan Jirásek, Petr Havlásek, Matěj Lepš, Jan Zeman, Jiří Máca, Václav Nežerka, Aleš Jíra, Aleš Jíra	Z	30	24C	Z	S1
133DPM	Diploma Thesis Martin Tipka	Z	30	24C	Z	S1
134DPM	Diploma Thesis Jakub Dolejš Jakub Dolejš Jakub Dolejš (Gar.)	Z	30	24C	Z	S1
135DPM	Diploma Thesis Jan Pruška, Jan Masopust Jan Pruška Jan Pruška (Gar.)	Z	30	24C	Z	S1

Characteristics of the courses of this group of Study Plan: Code=NC20230300 Name=Stavební inženýrství - pozemní stavby, diplomová práce

<u> </u>						
124DPM	Diploma Thesis	Z	30			
The topics of diploma	theses are based on the needs of practice or the scientific research activity of the department, the scope and difficulty corresp	onds to the stude	ent's knowledge			
acquired during the ma	aster's studies. The supervisor of the thesis can designate additional consultants to the student.					
132DPM	Diploma Thesis	Z	30			
In accordance with the thesis proposal.						
133DPM	Diploma Thesis	Z	30			
In accordance with a t	nesis proposal.					
134DPM	Diploma Thesis	Z	30			
Design of steel / timbe	r load bearing building structure according to external requirements in relation to interaction of load bearing and final completi	on structural elen	nents. A study			
focused on research o	f load bearing structures may be also the topic of the the project. The project is assigned by a final project superisor individual	ly.				
135DPM	Diploma Thesis	Z	30			
In the diploma thesis,	the student deals with a topic chosen by the department from those regularly announced by the department. It addresses, for	example, problem	ns related to the			
design and construction	on of geotechnical structures, civil engineering structures, special foundations for industrial, transport, housing and water mana	gement structure	s, earth and rock			
structures in complex	ctures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project					

List of courses of this pass:

Code	Name of the course	Completion	Credits
101MAPS	Mathematics PS	Z,ZK	3
	Focused on basic and more advanced statistical and probabilistic methods of data analysis as well as on hypothesis testing and re-	gression.	1
101YFAV	Introduction to Functional Analysis and Variational Methods	KZ	2
101YMCD	Methods of Time Discretization	Z	2
The course is devote	d to a universal and very effective method for solving problems involving time, the so-called evolutionary problems, especially for pa	artial differential eq	uations with
a time variable. This r	method represents a modern approach to modeling and solving engineering tasks. These problems, both linear and non-linear, mod	del events in many	engineering
	fields, such as heat conduction, oscillations, also in rheology and other parts.		
101YMST	Mathematical statistics for technicians	Z	2
	Inferential statistics. Theory of probability. Random variables and its characteristics. Basic methods of mathematical statistic	S.	,
101YNUM	Numerical Methods	Z	2
	Numerical computing in applied mathematics: course for beginners.		1
102YFPL	Solid State Physics in Civil Engineering	Z	2
Solids, crystal struct	ure, atomic shell theory, valence layer chemical bonds, dislocation disturbances, critical crack energy, vibration of masses, systems	natural frequency	of vibration
and damped vibration	n, basics concepts of fracture mechanics, types of fracture, electron microscopes, scanning tunneling microscope, atomic force mic	roscope, diffraction	n, diffraction

methods, semiconductors, p-n junction, photovoltaic effect, solar cells, heat and moisture transport.

122YTSD	Technology of Component Production	Z	2
123YMPU	Materials for Coatings	 Z	2
	an overview of how to protect building structures from corrosion and other harmful influences such as UV radiation, acid rain, etc. St		_
•	logies of surface treatment. The course consists of 6 lectures and 6 exercises. In the lectures, students will learn about both historical		
surface treatments f	for different types of structures. In the exercises, students will perform a surface treatment on a fragment of a structure and will be at	ole to check the o	uality of th
	work done by themselves in the last exercise by means of a tear-off test.		
124DPM	Diploma Thesis	Z	30
The topics of diplom	na theses are based on the needs of practice or the scientific research activity of the department, the scope and difficulty correspond	ds to the student	knowledg
	acquired during the master's studies. The supervisor of the thesis can designate additional consultants to the student.		
124PS4C	Building Structures 4	Z,ZK	4
124YADO	Acoustics and Daylighting of Buildings	Z	2
The course focuses o	on a more detailed explanation and practice of selected topics in the field of daylighting and building acoustics that students may enco	unter in future de	sign practic
124YCPV	The Principles of Circular Economy in Building Construction	Z	2
124YDPH	Diagnosis and Surveying of Building Structures	7	2
	ey considerations and implications which require structure assessment. The course provides an objective framework and methodical	_	_
	diagnosis, preliminary and comprehensive survey, visual inspection, site inspections, laboratory tests, investigation kits, types of defe	=	
3 (*******	manifestation, significance, criticality, reason for failures case studies)		., -,
124YDSR	Demolitions of Buildings and Material Recycling	7	2
	tion waste from demolitions from the production of building materials and from other sectors in the construction industry with the ain	_	_
	materials, reducing the consumption of primary raw materials, a new perspective on the design of buildings and structures in accor		_
	of recycling in developed countries, recycling in CR, possibilities of recycling buildings and structures, design of structures from the		=
	development, minimization of landfills, examples and demonstrations of recycling technologies, low-waste technologies		
124YHVK	Long Span Structures	Z	2
	th the analysis of structural solutions applied in building designs by the world's best architects. Although attention will be focused mainly		1
structures, we will als	so pay attention to the wider context of the design. Reading existing constructions is a natural way to learn the principles of their desi	gn. And naturally	we will lea
rom the best. An exte	ensive database of completed buildings, including more than 5,000 buildings, will enable us to take a trip into history and the presen	t on all the world	s continent
124YKHK	Building Quality Complex Assessment	Z	2
Students will gain an	overview of design strategies in green architecture and sustainable building and learn how to conduct assessments to achieve high	n quality buildings	. In additio
	they will learn basic information on life cycle assessment of materials and buildings.		
124YMOB	Modelling of Buildings - BIM	Z	2
	gned to introduce the phenomenon of parametric design, which is becoming very widespread in today's world. It is the connection of	3D models and l	3IM models
_	ming. Instead of writing code in a classical programming language, Nodes are connected, and the resulting script can be created vis		
with visual programi	ining. Indicate of writing code in a classical programming language, reduce are connected, and the resulting soript can be created vis	sually and withou	t knowledg
	I language. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structural a	•	Ū
of the programming		and physical anal	ysis, desigr
of the programming	g language. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structural asymptotically, the course covers two main areas of parametric modeling, replicating two software platforms: Revit + Dynamo (JaVe) Rhin	and physical anal	ysis, desigr
of the programming optimization. The	glanguage. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structural as ematically, the course covers two main areas of parametric modeling, replicating two software platforms: Revit + Dynamo (JaVe) Rhin Principles of Building Fire Safety	and physical anal no + Grasshoppe ZK	ysis, desigr r (ZdMa)
of the programming optimization. The 124YPBS The course is focused.	g language. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structural asymptotically, the course covers two main areas of parametric modeling, replicating two software platforms: Revit + Dynamo (JaVe) Rhin	and physical anal no + Grasshoppe ZK I the main compo	ysis, design r (ZdMa) 2 enents of fir
of the programming optimization. The 124YPBS The course is focused.	language. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structural attentional parametric modeling, replicating two software platforms: Revit + Dynamo (JaVe) Rhin Principles of Building Fire Safety ed on the presentation and acquisition of the most important concepts and principles of fire safety in buildings. Attention is paid to all	and physical anal no + Grasshoppe ZK I the main compo	ysis, design or (ZdMa) 2 onents of fin
of the programming optimization. The 124YPBS The course is focuse	planguage. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structural attentional parametric modeling, replicating two software platforms: Revit + Dynamo (JaVe) Rhin Principles of Building Fire Safety ed on the presentation and acquisition of the most important concepts and principles of fire safety in buildings. Attention is paid to all re important for the protection of life and health, property, the environment and other assets. The course is intended for students of n	and physical anal no + Grasshoppe ZK I the main compo	ysis, design or (ZdMa) 2 onents of fin
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132DY01	Dynamics of structures 1	7 7K	5
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	iscoelasticity, models for concrete creep. Theory of plasticity, principles of limit and incremental analysis. Fracture mechanics. Damage	e mechanics.	
132YKPA	Statics for Architecture	Z	2
132YMMO	Modern Methods of Optimization	Z	2
The course is aime		roduction of driving	principles,
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132YNA2		7 7K	4
Advanced course (militeal problems.	geometricar
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load capacity, distr		y means of a gene	rai-purpose
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Limit state of frame		ynamic analysis of	structures.
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132YSHK	Statics and Reconstruction of Historical Structures	Z	2
Short overview of	historical vaults and roof trusses. Static behaviour and most frequent causes of failure. Methods of reconstruction, changes in foundat	ion conditions incl	uded. Most
	frequent causes of failure of panel buildings. Visit to the historical part of Prague Castle.		
132YSSK	Reliability of Structures	Z	2
The course is dev	oted 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.		
132YUPM	General Principles of Mechanics	Z,ZK	4
	!		nergy and
duality. Principle	of virtual work (power), variational principles (Lagrange, Castigliano, Hellinger-Reissner, Hu-Washizu) and their application to continu	ous and discrete r	nodels of
· ·	beams, frames, plates, walls and three-dimensional bodies.		
133B03C		7.7K	5
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Collaboration of		or all students. The	extent of
133YATK	Applied Theory of Structures	Z,ZK	4
Detailed introduction	on to theoretical approaches to the effects of creep and shrinkage on structures. Principles of time-dependent analysis. Methods for the a	nalysis of thin-wall	ed concrete
	structures, stability theory.		
133YBEX	Concrete under Extreme Conditions	Z	2
	The course is focused on concrete and concrete structures under extreme conditions.	'	

133YMVB	Concrete and Masonry Structures 1	Z	2
The content of the	subject will be selected problems from the following areas: Reinforcement of discontinuities of reinforced concrete structures. Introdu	ction to nonlinear r	modeling of
reinforced concr	ete structures. Preparation of input data for numerical models. Design of structures using MATLAB. Presentation of selected program	s for the design of	concrete
	structures.		
133YPNB	Fire desgn og concrete and mnsory structures	Z	2
The course is focus	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and		n principles,
	design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structu		_
133YPRK	Failures and Rehabilitation of Concrete Structures	Z	2
	es on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur		• •
existing concrete	structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben	aing moment and s	snear, and
100\/\/ D	foundation structures are discussed. The course appropriately combines theoretical approaches with common practice.	7	
133YVHB	Ultrahigh Performance Concretes rse is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin	Z	2
	e concrete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devote		
	ncrete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the s		- 1
ponomanos so.	theoretical knowledge in practical use.	tado no can expon	
134DK02	Timber Structures 2	Z,ZK	4
	s on a design of timber elements and structures - static action, choice of computational models and methods, design of details and jc		
134DPM	Diploma Thesis	Z	30
_	imber load bearing building structure according to external requirements in relation to interaction of load bearing and final completion	_	
-	used on research of load bearing structures may be also the topic of the the project. The project is assigned by a final project superis		,
134O02C	Steel Structures 2C	Z,ZK	4
	rledge received from courses 133NNK and 1340K01. Amplifying of theoretical knowledge in the field of steel grade selection, toughnes		f structures,
buckling of structur	al systems, joint classification, and high strength steel and demanding composite steel and concrete structures. Complementation of l	knowledge from fire	e resistance
of steel and compo	site structures and detailed design of industrial buildings and crane girders. Design of masts, towers, chimneys, tanks, silos and pipe	lines, technological	l structures,
	pre-stressed steel structures and basis of design from aluminium alloys and stainless steel, and cable and membrane structu	res.	
134P03C	Structural Design 3C	KZ	5
Design of steel / tin	nber load bearing building structure according to external requirements in relation to interaction of load bearing and final completion s	tructural elements.	The project
	is assigned by the seminar leader.		
134P04C	Structural Design 4C	KZ	5
Design of steel / tin	nber load bearing building structure according to external requirements in relation to interaction of load bearing and final completion s	tructural elements.	The project
	is assigned by the seminar leader.		
134YDKM	Timber structures and bridges	Z	2
Timber structures f	ocused to national strategy of sustainable development. New timber-based materials. Structural systeme of houses and bridges. Rep		ntening. Fire
4000000	design. Production, protection, erection and maintenance. Design and evaluation of bridges, roofs structures in normal temperature		
134YHNK	Stainless steel and aluminium structures	Z	2
=	ers two parts: the first concerns design of structures from aluminium alloys, the second deals with stainless steel structures. Structures o signing of aluminium structures. Structures of stainless steel: Evolution of stainless steel materials/structures and examples of realize		
•	tures are described in a detail, including their properties. Dissimilarities in assessments of members under common loadings with res		
	h ultimate and serviceability limit states. In the end the possibilities concerning connections of stainless steel members, erection and	•	
	members are described.		
134YNDK	Load-bearing timber roof constructions	Z	2
	uctures. Creation of numerical models for assessment of internal forces and deformations for main different roof systems and structures	s. Analysis of the sta	
and behaviour of n	nain individual elements and their design. Historic structures and their reconstruction. Designing typical structural details based on ca	rpentry joints. We v	will discuss
	also using modern methods of joining elements of timber structures.		
134YNSK	Design of Glass Structures	Z,ZK	2
The subject is inte	ended for students of the master's program Civil Engineering, deepens the knowledge acquired in the subject 134YNKS. Extension of	theoretical knowle	edge in the
field of stability of g	glass beams, columns and walls. Principles of designing structural elements made of glass according to normative documents, exper	imental verification	of material
	properties of glass, safety glass, use of software support for designing.		
134YPMK	Design of Membrane Structures	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.	
134YROK	Extending the Life of Steel and Timber Structures	Z	2
	pearing structures. Developments in the area of regulations and standardization. Causes of defects, malfunctions, survey of objects, static	•	
Possibilities of st	rengthening, strengthening of steel and timber structures and strengthening of connections. Using of computers in reconstructions ar	nd development of r	numerical
	models.		
134YSMK	Stability and modelling of steel structures	Z	2
-	vers two parts. The first one deals with stability and strength of steel plates, the second one with stability and strengths of steel frame		
	of steel structures are analysed including the importance of imperfections for a design of thin plated structures. Presented are principle party of buckling of thin plates. The results are applied to the 4th class cross sections in harmony with Eurocode, Buckling due to norm	=	- 1
	eory of buckling of thin plates. The results are applied to the 4th class cross sections in harmony with Eurocode. Buckling due to norm bination is analysed in a detail. In the end the application of the results is shown together with design of necessary stiffeners. The secc		- 1
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	illity. Possible global analysis methods are presented together with methods for compression and bending interaction for slender mem	iders. In detall, sne	
	ility. Possible global analysis methods are presented together with methods for compression and bending interaction for slender mem of lateral torsional buckling are explained including also tapered members.	ibers. In detail, spe	Joine Cases
134YSOD	of lateral torsions of steel and timber structures Online On	Z	
134YSOD	of lateral torsional buckling are explained including also tapered members.	Z	2
	of lateral torsional buckling are explained including also tapered members. 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	
134YSOK	of lateral torsional buckling are explained including also tapered members. Connections of steel and timber structures	Z Z Z	2

135DPM	Diploma Thesis	Z	30
In the diploma the	is, the student deals with a topic chosen by the department from those regularly announced by the department. It addresses, for exa	mple, problems re	lated to the
design and constru	ction of geotechnical structures, civil engineering structures, special foundations for industrial, transport, housing and water managen	nent structures, ea	arth and rock
	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis proje	ct.	
135P03C	Structural Design 3C	KZ	5
'	Design, static calculation and drawing documentation of the building substructure		'
135P04C	Structural Design 4C	KZ	5
'	Design, static calculation and drawing documentation of the building substructure		1
135YGSM	Geotechnical Software for Numerical modelling	Z	2
	inted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on intro	oducing the basic	principles of
the Finite Element N	Method and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite	elements used in	geotechnical
applications, materi	al models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. Th	is knowledge is fu	rther applied
	in the modeling of foundation, embedded walls, and stability problems.		
135YVPZ	Computer analysis in underground structures	Z	2
Numerical meth	ods in CAD/CAM in geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical	software both in th	ne field of
	conventional methods and in numerical modelling domain. Practical solutions of selected geotechnical problems.		
135ZS02	Foundations 2	Z,ZK	4
The course deep	ens the knowledge from the previous course ZS1. It covers design principles, risks associated with the foundation of structures, deep	er design of flat fo	undations,
deeper de	sign of deep foundations, negative casing friction of drilled piles, grouting (calculations and execution), construction pits, improvemen	nt of foundation so	oils.
210YDSM	Diagnostics of Building Materials Properties	Z	2
Failures of buildi	ng materials, mechanical, thermal, chemical and other influences on the development of failures of building materials. Diagnostics of	their occurrence.	Basics of
experimental meas	surement and instrumentation of tested elements and structures. Theory of experiment, measurement and processing of results. Test	ing machines and	equipment.
Deformation mea	suring instruments. Destructive testing of mechanical properties. Non-destructive test methods. Test methodology for various materia	ls (concrete, mort	ar, metallic
	elements, wood, glass, plastics, composites and others).		
210YSB	Special Concretes	Z	2
This course is ain	ned at expanding knowledge in the field of special concretes and composites for specific applications. The core of the course is to accompany the contract of the course is to accompany to the course of the course is to accompany to the course of the course is to accompany to the course of the co	quaint students wi	th both the
technological aspec	cts of the production, testing and use of special concretes, as well as the applicable legislative framework for individual types of speci	al concretes. Spec	cific practical

applications and experiences are also presented within the course.

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2025-12-07, time 15:00.