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 Jana Nosková Jana Nosková (Gar.)	Z,ZK	3	2P+1C	Z	Z
124PS4C	Building Structures 4 Vladimír Ž ára, Hana Gattermayerová, Tomáš ejka, Ctislav Fiala Vladimír Ž ára Vladimír Ž ára (Gar.)	Z,ZK	4	2P+2C	Z	Z
132NAK	Numerical Analysis of Structures Bo ek Patzák, Jan Vo íšek, Tomáš Krej í Bo ek Patzák Bo ek Patzák (Gar.)	Z,ZK	5	2P+2C	Z	Z
133B03C	Concrete Structures 3C Jan Vítek, Lukáš Vráblík 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 and 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 principles of	mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric	elements, area co	oordinates,				
numerical integration.	Application of method to selected 1D and 2D problems (Elasticity, heat transfer, consolidation). Algorithmic aspects of the met	hod.					
133B03C	Concrete Structures 3C	Z,ZK	5				
Extension of knowledge	Extension of knowledge in the design of prestressed concrete structures. Introduction to special hybrid and thin-walled structures. Modern materials and design solutions for the future.						
134O02C	Steel Structures 2C	Z,ZK	4				
Deepening of knowledg	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,						
1 10 6 6 6 1							

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: 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

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 Josef Jettmar, Jan Masopust, Daniel Jirásko Jan Masopust Josef Jettmar (Gar.)	Z,ZK	4	2P+2C	L	Z
132DY01	Dynamics of structures 1 Tomáš Krej í, Ji í Máca, Karel Pohl, Kristian D'Amico Ji í Máca Ji í Máca (Gar.)	Z,ZK	5	2P+2C		Z
132EADC	Experimental Analysis and Diagnostics C Michal Polák, Robert Jára, Pavel Padev t, Pavel Tesárek, Tomáš Plachý Michal Polák Michal Polák (Gar.)	KZ	3	1P+2C	L	Z
133B04C	Concrete Structures 4C Martin Pet ík, Petr Štemberk Petr Štemberk (Gar.)	Z,ZK	5	2P+2C	L	Z
134DK02	Timber Structures 2 Karel Mikeš Jakub Dolejš Karel Mikeš (Gar.)	Z,ZK	4	2P+1C	L	Z

134DK02	Timber Structures 2 Karel Mikeš Jakub Dolejš Karel Mikeš (Gar.)	Z,ZK	4	2P+1C	L	Z
Characteristics o	f the courses of this group of Study Plan: Code=NC20230202 Name	e=Statika po	zemních	staveb, 2.	semesti	ſ
135ZS02	Foundations 2			Z,	ZK	4
The course deepens the	ne knowledge from the previous course ZS1. It covers design principles, risks associated wit	h the foundation	of structure	s, deeper des	gn of flat fo	undations,
deeper design of deep	foundations, negative casing friction of drilled piles, grouting (calculations and execution), co	onstruction pits, i	mprovemer	nt of foundation	n 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 o	of dynamic and	alysis of	
muti-degreee-of-freeed	dom systems.					
132EADC	Experimental Analysis and Diagnostics C			k	Z	3
Experiments focused of	on monitoring of the amount of climatic loads on building and engineering structures (wind, s	now, temperature	e loads), dia	agnostics of bu	ilding and e	engineering
structures, tests carrie	d out on physical models of building and engineering structures (model similarity laws, seisn	nic simulations or	n shake tab	les, wind tunne	el simulation	ns of wind
effects, static load test	s on physical models), monitoring of building and engineering structures, static load tests (but	uilding structures	, engineerir	ng structures, l	oridges), dy	namic load
tests and experimental	I modal analysis (building structures, engineering structures, bridges, footbridges), effects of	technical seismi	city, evaluat	ion of adverse	effects of v	ibration on
the human body, asses	ssment of the influence of building vibrations on installed machines and devices).					
133B04C	Concrete Structures 4C			Z,	ZK	5
Extension of knowledg	e in the field of design of reinforced concrete structures, when the emphasis is put on develo	pment of engine	ering sense	e. Within the so	cope of this	subject, the
student acquires ability	γ to estimate arrangement of reinforcement in RC slabs of general shape, ability to define ba	sic strut-and-tie r	models for g	given structura	l details, ab	ility to provide
optimum reinforcemen	t at general point of RC slabs and RC walls based on normal forces distributions obtained wi	th common engir	neering soft	ware. Also, the	student le	arns the basic
principles plastic desig	n of RC structures and design of RC foundations.					
134DK02	Timber Structures 2			Z,	ZK	4
Lectures on a design of	of timber elements and structures - static action, choice of computational models and method	ds design of deta	ails and ioin	te fire recistar	nce '	

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 p edm ty, 1. semestr

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

Name of the course / Name of the group of courses

Vladimír Mózer Vladimír Mózer Vladimír Mózer (Gar.)

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

Credits in the group: 4

124YPBS

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

(in case of groups of courses the list of codes of their Completion Credits Code Scope Semester Role members) Tutors, authors and guarantors (gar.) Solid State Physics in Civil Engineering 102YFPL Z 1P+1C Ζ PV Ji í Konfršt **Ji í Konfršt** Ji í Konfršt (Gar.) Technology of Component Production Rostislav Šulc Rostislav Šulc (Gar.) Ζ 2 1P+1C Z,L122YTSD Acoustics and Daylighting of Buildings 124YADO Ζ 2 1P+1C Ζ PV Jaroslav Vychytil, Ji í Nová ek **Ji í Nová ek** Jaroslav Vychytil (Gar.) The Principles of Circular Economy in Building Construction 124YCPV Ζ 2 1P+1C Ζ Tereza Pavl Tereza Pavl Tereza Pavl (Gar.) Diagnosis and Surveying of Building Structures Eva Burgetová Eva Burgetová Eva Burgetová (Gar.) 124YDPH Ζ 2 1P+1C Ζ PV Demolitions of Buildings and Material Recycling Šárka Šilarová **Šárka Šilarov**á Šárka Šilarová (Gar.) 124YDSR Ζ 2 1P+1C Ζ PV Principles of Building Fire Safety

ZK

2

1P+1C

Ζ

PV

124YPRS	Failures, Deterioration, Renovations Radek Zigler 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 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 Mat j Lepš, Jan Zeman Mat j Lepš Mat j Lepš (Gar.)	Z	2	1P+1C	Z	PV
132YSEI	Seismic Engineeering Ji í Máca Ji í Máca Ji í Máca (Gar.)	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 Extreme Conditions Petr Štemberk, Radek Štefan, Marek Foglar Radek Štefan Radek Štefan (Gar.)	Z	2	1P+1C	Z	PV
133YPRK	Failures and Rehabilitation of Concrete Structures Petr Štemberk, Yuliia Khmurovska, Jakub Žák Petr Štemberk Petr Štemberk (Gar.)	Z	2	1P+1C	Z	PV
134YDKM	Timber structures and bridges Anna Kuklíková 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 Josef Machá ek, Michal Jandera Michal Jandera Josef Machá ek (Gar.)	Z	2	1P+1C	Z	PV
135YGSM	Geotechnical Software for Numerical modelling Daniel Turanský, Jan Pruška, Jan Ježek Alena Zemanová Jan Pruška (Gar.)	Z	2	1P+1C	Z	PV
210YDSM	Diagnostics of Building Materials Properties Ji í Litoš Ji í Litoš (Gar.)	Z	2	1P+1C	Z	PV
210YSB	Special Concretes Pavel Reiterman, Vendula Davidová 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 p edm ty, 1. semestr

102YFPL	Solid State Physics in Civil Engineering	Z	2
Solids, crystal struct	ture, atomic shell theory, valence layer chemical bonds, dislocation disturbances, critical crack energy, vibration of masses, syste	ms natural freque	ncy of vibration
and damped vibration	on, basics concepts of fracture mechanics, types of fracture, electron microscopes, scanning tunneling microscope, atomic force	microscope, diffra	action, diffraction
methods, semicond	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 e	encounter in future	design practic
124YCPV	The Principles of Circular Economy in Building Construction	Z	2
124YDPH	Diagnosis and Surveying of Building Structures	Z	2
Course sets out key	consideratons and implications which require structure assessment. The course provides an objective framework and methodic	al and systematic	approach to
surveying (structura	I diagnosis, preliminary and comprehensive survey, visual inspection, site inspections, laboratory tests, investigation kits, types of	f defects and dama	ages, symptom
manifestation, signif	ficance, criticality, reason for failures case studies)		
124YDSR	Demolitions of Buildings and Material Recycling	Z	2
The use of construc	tion waste from demolitions from the production of building materials and from other sectors in the construction industry with the	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	ccordance with a	•
•	f recycling in developed countries, recycling in CR, possibilities of recycling buildings and structures, design of structures from the	ne point of view of	sustainable
•	nization of landfills, examples and demonstrations of recycling technologies, low-waste technologies	ne point of view of	sustainable
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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. 133YBFX 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 Ζ 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 2 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. 134YROK Extending the Life of Steel and Timber Structures 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 134YSMK Stability and modelling of steel structures 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

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 Z 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 p edm ty, 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 zapsat znovu.

	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
101YFAV	Introduction to Functional Analysis and Variational Methods Aleš Nekvinda Aleš Nekvinda Aleš Nekvinda (Gar.)	KZ	2	1P+1C	Z,L	PV
101YMCD	Methods of Time Discretization Petr Mayer František Bubeník František Bubeník (Gar.)	Z	2	1P+1C	L	PV
101YMST	Mathematical statistics for technicians Daniela Jarušková Jana Nosková Daniela Jarušková (Gar.)	Z	2	1P+1C	L	PV
101YNUM	Numerical Methods Ivana Pultarová, Martin Ladecký, Liya Gaynutdinova Ivana Pultarová Ivana Pultarová (Gar.)	Z	2	1P+1C	L	PV
123YMPU	Materials for Coatings Miloš Jerman Miloš Jerman Miloš Jerman (Gar.)	Z	2	1P+1C	L	PV
124YHVK	Long Span Structures Vladimír Ž ára Vladimír Ž ára (Gar.)	Z	2	1P+1C	L	PV
124YKHK	Building Quality Complex Assessment Martin Volf Martin Volf (Gar.)	Z	2	1P+1C	L	PV
124YMOB	Modelling of Buildings - BIM Zdenko Malík Zdenko Malík (Gar.)	Z	2	1P+1C	L	PV
124YPFS	Precast concrete structures Radek Zigler, Ji í Witzany Radek Zigler Radek Zigler (Gar.)	Z	2	1P+1C	L	PV
124YPS5	Prefabricated structures Tomáš ejka Tomáš ejka Tomáš ejka (Gar.)	Z	2	1P+1C	L	PV

124YRHS	Reconstruction of Historical Building Structures Tomáš ejka, Radek Zigler, Ji í Witzany Ji í Witzany Ji í Witzany (Gar.)	Z	2	1P+1C	L	PV
125YTCH	Technological Equipment of Buildings Ilona Koubková, Hana Kabrhelová, Pavla Hofbauer Pechová Ilona Koubková Ilona Koubková (Gar.)	Z	2	2P	L	PV
126YBVE	BIM in Public Investments	Z	2	2P	L	PV
126YPDV	Development Project Kate ina Válková Kate ina Válková (Gar.)	Z	2	2C	L	PV
132YNAK	Nonlinear Analysis of Materials and Structures Bo ek Patzák, Petr Kabele, Daniel Rypl Daniel Rypl Daniel Rypl (Gar.)	Z	2	1P+1C	L	PV
132YNA2	Numerical Analysis of Structures 2 Bo ek Patzák Bo ek Patzák Bo ek Patzák (Gar.)	Z,ZK	4	2P+1C	L	PV
132YPM2	Computer Analysis of Structures 2 Ji í Máca, Petr Fajman Ji í Máca Petr Fajman (Gar.)	Z	2	1P+1C	L	PV
132YSHK	Statics and Reconstruction of Historical Structures Petr Fajman Petr Fajman (Gar.)	Z	2	1P+1C	L	PV
132YUPM	General Principles of Mechanics Milan Jirásek Milan Jirásek (Gar.)	Z,ZK	4	2P+1C	L	PV
133YATK	Applied Theory of Structures Lukáš Vráblík, Radek Hájek Lukáš Vráblík (Gar.)	Z,ZK	4	2P+1C	L	PV
133YMVB	Concrete and Masonry Structures 1 Roman Chylik, Petr Bílý, Josef Novák Petr Bílý Petr Bílý (Gar.)	Z	2	1P+1C	L	PV
133YPNB	Fire desgn og concrete and mnsory structures Radek Štefan, Martin Benýšek Radek Štefan Radek Štefan (Gar.)	Z	2	1P+1C	L	PV
133YVHB	Ultrahigh Performance Concretes Josef Fládr Josef Fládr (Gar.)	Z	2	1P+1C	L	PV
134YHNK	Stainless steel and aluminium structures Josef Machá ek, František Wald František Wald Josef Machá ek (Gar.)	Z	2	1P+1C	L	PV
134YNDK	Load-bearing timber roof constructions Karel Mikeš Karel Mikeš (Gar.)	Z	2	1P+1C	L	PV
134YNSK	Design of Glass Structures Martina Eliášová Martina Eliášová (Gar.)	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 Zden k Sokol Zden k Sokol Zden k Sokol (Gar.)	Z	2	1P+1C	L	PV
134YSOD	Connections of steel and timber structures Robert Jára, František Wald Robert Jára František Wald (Gar.)	Z	2	1P+1C	L	PV
134YSOK	Special steel structures Jakub Dolejš Jakub Dolejš (Gar.)	Z	2	1P+1C	L	PV
135YVPZ	Computer analysis in underground structures Daniel Turanský, Jan Pruška, Jan Ježek Jan Pruška Jan Pruška (Gar.)	Z	2	1P+1C	L	PV

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

semestr		, ,	•
101YFAV	Introduction to Functional Analysis and Variational Methods	KZ	2
101YMCD	Methods of Time Discretization	Z	2
The course is devoted t	o a universal and very effective method for solving problems involving time, the so-called evolutionary problems, especially fo	r partial differentia	al equations with
a time variable. This me	thod represents a modern approach to modeling and solving engineering tasks. These problems, both linear and non-linear, I	model events in m	any engineering
fields, such as heat cor	duction, oscillations, also in rheology and other parts.		
101YMST	Mathematical statistics for technicians	Z	2
Inferential statistics. The	eory of probability. Random variables and its characteristics. Basic methods of mathematical statistics.		
101YNUM	Numerical Methods	Z	2
Numerical computing in	applied mathematics: course for beginners.	'	
123YMPU	Materials for Coatings	Z	2
Students will gain an ov	rerview 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 technolog	ies of surface treatment. The course consists of 6 lectures and 6 exercises. In the lectures, students will learn about both histor	rical and more imp	ortantly modern
surface treatments for o	lifferent types of structures. In the exercises, students will perform a surface treatment on a fragment of a structure and will be	e able to check th	e quality of the
work done by themselv	es in the last exercise by means of a tear-off test.		
124YHVK	Long Span Structures	Z	2
The subject deals with the	e 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 also	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 exten-	sive database of completed buildings, including more than 5,000 buildings, will enable us to take a trip into history and the pre	esent on all the wo	orld's continents.
124YKHK	Building Quality Complex Assessment	Z	2
Students will gain an ov	rerview of design strategies in green architecture and sustainable building and learn how to conduct assessments to achieve	high quality build	ngs. In addition,
they will learn basic info	ormation on life cycle assessment of materials and buildings.		
124YMOB	Modelling of Buildings - BIM	Z	2
The course is designed	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 programming. Instead of writing code in a classical programming language, Nodes are connected, and the resulting script can be created visually and without knowledge of the programming language. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structural and physical analysis, design optimization. Thematically, the course covers two main areas of parametric modeling, replicating two software platforms: Revit + Dynamo (JaVe) Rhino + Grasshopper (ZdMa)

124YPFS Residential houses made	Precast concrete structures	Z	2
	le of precast conrete panels, of which approx. 82 thousand were built in the period 1960-1995 do not meet the required exter	nt of the current d	ynamically
developing society and	in many cases require the implementation of regeneration and modernization interventions enabling their full use. The course	e is focused on the	e current issues
of renewal, reconstruction	on and modernization of precast houses, modernization of apartments in precast houses, on the issue of freeing parterres of p	recast houses for	services, shops,
	etc. Renovation, modernization, or regenerations require the removal of functionally inadequate completion structures, techn		
	manding interventions in supporting structures. As part of the construction of communication networks, modernization of urban		-
· ·	out partial or complete demolition of a precast panel building. As part of the regeneration of precast panel housing estates, a		
1	ouses. The implementation of the mentioned plans requires a survey and diagnostics of supporting and peripheral structures al condition and an assessment of the residual life of precast panel structures and buildings.	s, joints of parts ar	id an evaluation
124YPS5	Prefabricated structures	Z	2
		7	2
124YRHS	Reconstruction of Historical Building Structures		_
I	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 the		-
	ion and modernization interventions, including the replacement of non-compliant and out-of-date structures and equipment ena	-	· ·
	issue of renewal, reconstruction and modernization of brick multi-storey rental apartment buildings, on historical structures and	-	
and aging of structures	and materials of historic brick residential buildings, their residual life, failures and reconstruction of historical buildings and the	eir parts. Furtherr	nore, the course
is focused on the issue	of improving the well-being of the internal environment, the replacement of finishing structures, opening fillings, etc. as an int	egral part of the r	nodernization of
these buildings.			
125YTCH	Technological Equipment of Buildings	Z	2
	en technology, elevators, technology swimming pools, heat pumps, heat source and technological system, technology cooling	, fire safety equip	ment, sprinklers.
126YBVE	BIM in Public Investments	Z	2
126YPDV	Development Project	Z	2
132YNAK	Nonlinear Analysis of Materials and Structures	Z	2
Students become acqua	ainted with the concepts of linear stability and calculation of elastoplastic load capacity. Linear stability - evaluation of the criti	cal load and buck	ling shape.
Analysis of structures a	ccording to the 2nd order theory - equilibrium conditions on a deformed structure, initial stress matrix. Elastoplastic analysis of	f structures - evalu	ation of the limit
load capacity, distribution	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.			
132YNA2	Numerical Analysis of Structures 2	Z,ZK	4
	te element method. Formulation of plate elements suitable for thin and thick plates, plates on elastic foundation. Introduction to	o nonlinear proble	ems: geometrical
	y, solution methods, implementation aspects.		
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.	Otation and December of Historical Otation		0
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 e of panel buildings. Visit to the historical part of Prague Castle.	ndation conditions	included. Most
132YUPM	General Principles of Mechanics	7 71/	4
I IOZ I UFIVI			
	·	Z,ZK	4 energy and
Tensors, differential ope	rators and their application in mechanics, Gauss and Green theorems. General structure of the basic equations of linear and	nonlinear statics	, energy and
Tensors, differential ope duality. Principle of virtu	·	nonlinear statics	, energy and
Tensors, differential ope duality. Principle of virtu beams, frames, plates,	rators and their application in mechanics, Gauss and Green theorems. General structure of the basic equations of linear and al work (power), variational principles (Lagrange, Castigliano, Hellinger-Reissner, Hu-Washizu) and their application to continualls and three-dimensional bodies.	nonlinear statics nuous and discret	, energy and e models of
Tensors, differential ope duality. Principle of virtu beams, frames, plates, 133YATK	rators and their application in mechanics, Gauss and Green theorems. General structure of the basic equations of linear and all work (power), variational principles (Lagrange, Castigliano, Hellinger-Reissner, Hu-Washizu) and their application to continualls and three-dimensional bodies. Applied Theory of Structures	nonlinear statics nuous and discrete Z,ZK	, energy and e models of 4
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134YSOD	Connections of steel and timber structures	Z	2			
The subject allows ins						
134YSOK	Special steel structures	Z	2			
Crane supporting stru	ctures - actions, design, detailing. Silos - actions, behaviour, silos with rigid and non-rigid section. Masts - division, detiling, de	sign. Cable roofs	procedure of			
calculation.						
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						
Numerical methods in	CAD/CAN III geomechanics. Basic types of constitutive models of soil and rock mass behavior. Summary of PC geotechnical	oonware bour in	ino noid oi			

Name of the block: Povinn volitelné p edm ty, doporu ení 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 Pavel Tesárek, Jan Zeman, Petr Kabele, Aleš Jíra, Michal Šejnoha, 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

Onanaotoniotico o	the courses of the group of clary fram cous-freezestating personners	sta rob, p. ojo.	, 0000			
132P03C	Structural Design 3C	KZ	5			
Students develop indivi	dual projects under supervision of teachers from the Department of Mechanics. Project topics are presented at the departme	ent website. Studer	nts may propose			
own topics - in this case	e, 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 analys	is of the given prob	olem requiring			
subject matter search a	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.					
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 completion structural elements. The project						
is assigned by the seminar leader.						
135P03C	Structural Design 3C	KZ	5			
Design, static calculation	n 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:

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 Bo ek Patzák, Pavel Tesárek, Jan Zeman, Petr Fajman, Aleš Jíra, Michal Šejnoha, Martin Došká, Jan Vorel, Martin Horák, Aleš Jíra	KZ	5	4C	L	S1
133P04C	Structural Design 4C Jitka Vašková	KZ	5	4C	L	S1
134P04C	Structural Design 4C Michal Jandera Michal Jandera (Gar.)	KZ	5	4C	L	S1
135P04C	Structural Design 4C Jan Pruška Jan Salák (Gar.)	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 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 5 Design of steel / timber load bearing building structure according to external requirements in relation to interaction of load bearing and final completion structural elements. The project is assigned by the seminar leader. 135P04C Structural Design 4C ΚZ 5

Code of the group: NC20230300

Design, static calculation and drawing documentation of the building substructure

Diploma Thesis

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

Jakub Dolejš **Jakub Dolejš** Jakub Dolejš (Gar.)

Jan Masopust, Jan Pruška **Jan Pruška** Jan Pruška (Gar.)

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:

134DPM

135DPM

Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their Code Completion Credits Scope Semester Role members) Tutors, authors and guarantors (gar.) **Diploma Thesis** 124DPM Ζ 30 24C Ζ Tomáš ejka, Martin Jiránek, Kate ina Mertenová, Ji í Pazderka, Tomáš Vlach, Marek Pokorný **Ji í Pazderka** Ji í Pazderka (Gar.) **Diploma Thesis** 132DPM Ζ 30 24C Ζ S1 Bo ek Patzák. Ji í Máca. Karel Pohl. Michal Polák. Pavel Padev t. Pavel Tesárek, Tomáš Plachý, Milan Jirásek, Petr Havlásek, **Diploma Thesis** 133DPM 7 7 30 24C **S1** Martin Tipka Diploma Thesis Ζ

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

30

30

Ζ

24C

24C

Ζ

Ζ

S1

S1

prace			
124DPM	Diploma Thesis	Z	30
The topics of diploma th	eses are based on the needs of practice or the scientific research activity of the department, the scope and difficulty correspondent	onds to the stude	ent's knowledge
acquired during the ma	ster'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 th	esis proposal.		,
134DPM	Diploma Thesis	Z	30
Design of steel / timber	load bearing building structure according to external requirements in relation to interaction of load bearing and final completic	n structural elen	nents. A study
focused on research of	load bearing structures may be also the topic of the the project. The project is assigned by a final project superisor individually	/.	
135DPM	Diploma Thesis	Z	30
In the diploma thesis, th	e student deals with a topic chosen by the department from those regularly announced by the department. It addresses, for e	xample, problem	s related to the
design and construction	nof geotechnical structures, civil engineering structures, special foundations for industrial, transport, housing and water manag	ement structure	s, earth and rock
structures in complex ca	ases 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 regression.				
101YFAV	Introduction to Functional Analysis and Variational Methods	KZ	2	
101YMCD	Methods of Time Discretization	Z	2	

The course is devoted to a universal and very effective method for solving problems involving time, the so-called evolutionary problems, especially for partial differential equations with a time variable. This method represents a modern approach to modeling and solving engineering tasks. These problems, both linear and non-linear, model events in many engineering fields, such as heat conduction, oscillations, also in rheology and other parts.

101YMST	Mathematical statistics for technicians Inferential statistics. Theory of probability. Random variables and its characteristics. Basic methods of mathematical statistics	Z s.	2
101YNUM	Numerical Methods Numerical computing in applied mathematics: course for beginners.	Z	2
102YFPL	Solid State Physics in Civil Engineering	Z	2
Solids, crystal struc	ture, atomic shell theory, valence layer chemical bonds, dislocation disturbances, critical crack energy, vibration of masses, systems	natural frequency	of vibration
and damped vibratio	n, basics concepts of fracture mechanics, types of fracture, electron microscopes, scanning tunneling microscope, atomic force microscopes, atomic force microscopes, scanning tunneling microscopes, atomic force microscopes	oscope, diffractio	n, diffractior
	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
Students will gain	an overview of how to protect building structures from corrosion and other harmful influences such as UV radiation, acid rain, etc. St	udents will also le	earn about
nethods and techno	logies of surface treatment. The course consists of 6 lectures and 6 exercises. In the lectures, students will learn about both historical	and more importa	antly moder
surface treatments	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 q	uality of the
	work done by themselves in the last exercise by means of a tear-off test.		
124DPM	Diploma Thesis	Z	30
The topics of diplom	ha theses are based on the needs of practice or the scientific research activity of the department, the scope and difficulty correspond	is to the student's	knowledge
1010010	acquired during the master's studies. The supervisor of the thesis can designate additional consultants to the student.	7.71/	
124PS4C	Building Structures 4	Z,ZK	4
124YADO	Acoustics and Daylighting of Buildings	Z	2
	on a more detailed explanation and practice of selected topics in the field of daylighting and building acoustics that students may enco		
124YCPV	The Principles of Circular Economy in Building Construction	Z	2
124YDPH	Diagnosis and Surveying of Building Structures	Z	2
Course sets out ke	ey considerations and implications which require structure assessment. The course provides an objective framework and methodical	and systematic a	proach to
surveying (structural	diagnosis, preliminary and comprehensive survey, visual inspection, site inspections, laboratory tests, investigation kits, types of defe	cts and damages	, symptoms
	manifestation, significance, criticality, reason for failures case studies)		
124YDSR	Demolitions of Buildings and Material Recycling	Z	2
	tion waste from demolitions from the production of building materials and from other sectors in the construction industry with the aim		
	materials, reducing the consumption of primary raw materials, a new perspective on the design of buildings and structures in according		
Legislation, levels	of recycling in developed countries, recycling in CR, possibilities of recycling buildings and structures, design of structures from the	point of view of s	ustainable
	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		
	so pay attention to the wider context of the design. Reading existing constructions is a natural way to learn the principles of their desi		
	tensive database of completed buildings, including more than 5,000 buildings, will enable us to take a trip into history and the presen		
124YKHK	Building Quality Complex Assessment	Z	2
Students will gain ar	n overview of design strategies in green architecture and sustainable building and learn how to conduct assessments to achieve high they will learn basic information on life cycle assessment of materials and buildings.	i quality buildings	. In addition
124YMOB		Z	
	Modelling of Buildings - BIM gned to introduce the phenomenon of parametric design, which is becoming very widespread in today's world. It is the connection of	_	2
•	gried to introduce the prienomenon or parametric design, which is becoming very widespread in today's word, it is the connection of ming. Instead of writing code in a classical programming language, Nodes are connected, and the resulting script can be created vis		
	g language. These scripts can be used primarily for: - creating parametric geometry, - working with data in a BIM model, - structural a		
	ematically, the course covers two main areas of parametric modeling, replicating two software platforms: Revit + Dynamo (JaVe) Rhin		-
124YPBS	Principles of Building Fire Safety	ZK	2
	ed on the presentation and acquisition of the most important concepts and principles of fire safety in buildings. Attention is paid to al		1
	re important for the protection of life and health, property, the environment and other assets. The course is intended for students of n		
dioty doolgit that al	enable them to take into account aspects of fire safety from the initial stages of project preparation of buildings.	orr in o diooipiirioc	ana onoaic
124YPFS	Precast concrete structures	Z	2
	es made of precast conrete panels, of which approx. 82 thousand were built in the period 1960-1995 do not meet the required extent		
	and in many cases require the implementation of regeneration and modernization interventions enabling their full use. The course is	-	-
	uction and modernization of precast houses, modernization of apartments in precast houses, on the issue of freeing parterres of preca		
offices, fitness cente	ers, etc. Renovation, modernization, or regenerations require the removal of functionally inadequate completion structures, technical	equipment, insta	lations and
n some cases, even	demanding interventions in supporting structures. As part of the construction of communication networks, modernization of urban dev	elopment, etc., it	is necessar
in some cases to ca	rry out partial or complete demolition of a precast panel building. As part of the regeneration of precast panel housing estates, an ex	tension is also ca	rried out, o
completion of precas	st houses. The implementation of the mentioned plans requires a survey and diagnostics of supporting and peripheral structures, join	nts of parts and a	n evaluatior
	of the structural-technical condition and an assessment of the residual life of precast panel structures and buildings.		
124YPRS	Failures, Deterioration, Renovations	Z	2
The course is focuse	ed on the current issue of restoration, reconstruction and modernization of buildings (residential, industrial, etc.), on historical structur	es and materials,	the issue o
legradation and agin	ng of structures and materials of historical buildings, their residual life and failures of historical buildings and their parts. An integral part is t	he issue of structu	ıral-technica
	and historical surveys, diagnostics and assessment of the structural-technical condition and remaining service life.		1
124YPS5	Prefabricated structures	Z	2
124YRHS	Reconstruction of Historical Building Structures	Z	2
•	e second half of the 19th century by 1960, more than 250 thousand of two- to five-story brick apartment (mainly rental) houses in tra		
	zech Republic. Brick buildings from this period were built according to regulations, building codes and laws from the turn of the 19th a		-
	uses do not meet the current thermal, acoustic and other requirements, the requirements of a dynamically developing society to the	-	=
	eration and modernization interventions, including the replacement of non-compliant and out-of-date structures and equipment enabling	•	
	rent issue of renewal, reconstruction and modernization of brick multi-storey rental apartment buildings, on historical structures and materials and materials of historical buildings and their residual life, failures and respectively. If historical buildings and their residual life, failures and respectively.		-
and aging of structur	res and materials of historic brick residential buildings, their residual life, failures and reconstruction of historical buildings and their p		
e focused on the !	sue of improving the well-being of the internal environment, the replacement of finishing structures, opening fillings, etc. as an integra	I nort of the me-	arnization -
is aging or structur			

125OZE1 Renewable source	Renewable Energy Sources s are becoming increasingly important sources of energy for buildings. Understanding their characteristics is key to the proper design a	ZK nd operation of the	3 se systems.
125YTCH	The course therefore looks in detail at renewable sources and their applications. Technological Equipment of Buildings	Z	2
	kitchen technology, elevators, technology swimming pools, heat pumps, heat source and technological system, technology cooling, fire	_	
126YBVE	BIM in Public Investments	Z	2
126YPDV	Development Project	Z	2
132DPM	Diploma Thesis	Z	30
(225)(24	In accordance with the thesis proposal.		
132DY01	Dynamics of structures 1 of theory of vibration, dynamic loading. Free and forced vibration of single-degree-of-freedom systems. Damped vibration. Methods of	Z,ZK	5
Frinciples	muti-degreee-of-freedom systems. Damped vibration, Methods C	or dynamic analysis	5 01
132EADC	Experimental Analysis and Diagnostics C	KZ	3
	sed on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic		ngineering
	carried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wir		
	d tests on physical models), monitoring of building and engineering structures, static load tests (building structures, engineering structures), affects of technical existing about the production of a		
tests and experim	nental modal analysis (building structures, engineering structures, bridges, footbridges), effects of technical seismicity, evaluation of a the human body, assessment of the influence of building vibrations on installed machines and devices).	averse effects of v	ibration on
132NAK	Numerical Analysis of Structures	Z,ZK	5
	iples of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric	,	_
num	nerical integration. Application of method to selected 1D and 2D problems (Elasticity, heat transfer, consolidation). Algorithmic aspects	of the method.	
132P03C	Structural Design 3C	KZ	5
Students develop in	ndividual projects under supervision of teachers from the Department of Mechanics. Project topics are presented at the department w	ebsite. Students m	nay propose
1000010	own topics - in this case, suitability of the topic and feasibility of the project will be evaluated by the project supervisor.	1/7	_
132P04C	Structural Design 4C ndividual projects under supervision of teachers from the Department of Mechanics. Project topics are presented at the department w	KZ	5
Students develop ii	own topics - in this case, suitability of the topic and feasibility of the project will be evaluated by the project supervisor.	repsite. Students if	iay propose
132PRPM	Deformation and Failure of Materials	Z,ZK	5
	iscoelasticity, models for concrete creep. Theory of plasticity, principles of limit and incremental analysis. Fracture mechanics. Damag		Ü
132YKPA	Statics for Architecture	Z	2
132YMMO	Modern Methods of Optimization	Z	2
The course is aime	d at an overview of numerical optimization methods applicable not only in the Civil Engineering area. The emphasis is put more on the in	troduction of drivin	g principles,
	however, practical applications in MATLAB environment are also conducted during exercises.		
132YNA2	Numerical Analysis of Structures 2	Z,ZK	4
Advanced course o	on finite element method. Formulation of plate elements suitable for thin and thick plates, plates on elastic foundation. Introduction to no and material nonlinearity, solution methods, implementation aspects.	onlinear problems:	geometrical
132YNAK	Nonlinear Analysis of Materials and Structures	Z	2
	e acquainted with the concepts of linear stability and calculation of elastoplastic load capacity. Linear stability - evaluation of the critic		
	res according to the 2nd order theory - equilibrium conditions on a deformed structure, initial stress matrix. Elastoplastic analysis of str		
load capacity, distri	bution of internal forces at the limit state - static incremental method, kinematic method. Solving stability and elastoplasticity problems be	by means of a gene	ral-purpose
122/2012	finite element program.	_	
132YPM2	Computer Analysis of Structures 2	Z	2
Limit state of frame	es. Stability analysis of structures. Second order theory. Beams and gridwork girders on elastic foundation. Plate and wall structures. Description of results.	ynamic analysis o	r structures.
132YSEI	Seismic Engineeering	Z	2
	principles of design of earthquake resistant structures. Methods of calculating the response of structures to earthquake loads accordi		_
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 founda	tion 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 solved by the FORM method. Two simulation methods are introduced: Monte Carlo and LHS.	-load. Complicated	cases are
132YUPM	General Principles of Mechanics	Z,ZK	4
	tial operators and their application in mechanics, Gauss and Green theorems. General structure of the basic equations of linear and r	· '	
	of virtual work (power), variational principles (Lagrange, Castigliano, Hellinger-Reissner, Hu-Washizu) and their application to continu		
	beams, frames, plates, walls and three-dimensional bodies.		
133B03C	Concrete Structures 3C	Z,ZK	5
	edge in the design of prestressed concrete structures. Introduction to special hybrid and thin-walled structures. Modern materials and		
133B04C	Concrete Structures 4C Ledge in the field of design of reinforced concrete structures, when the emphasis is put on development of engineering sense. Within	the scope of this s	5
	bility to estimate arrangement of reinforcement in RC slabs of general shape, ability to define basic strut-and-tie models for given stru	•	-
1	nent at general point of RC slabs and RC walls based on normal forces distributions obtained with common engineering software. Als		
	principles plastic design of RC structures and design of RC foundations.		
133DPM	Diploma Thesis	Z	30
4000000	In accordance with a thesis proposal.	177	_
133P03C	Structural Design 3C	KZ	5 n requiring
1	used on concrete and masonry structures. The assignment can be: elaboration of the structural design documentation, the analysis c earch and literature retrieval, the numerical analysis of the selected element or part of the structure, the preparation, execution and ev		
1 -	several students on one assignments is also possible. Consultation with participating departments K124 and K135 is not mandatory f		
	outputs depends on the type of assignment and the decision of the leading teacher.		

133P04C	Structural Design 4C	KZ	5
•	used on concrete and masonry structures. The assignment can be: elaboration of the structural design documentation, the analysis of	• .	
•	arch and literature retrieval, the numerical analysis of the selected element or part of the structure, the preparation, execution and ev several students on one assignments is also possible. Consultation with participating departments K124 and K135 is not mandatory fo		
Collaboration of s	outputs depends on the type of assignment and the decision of the leading teacher.	or all students. The	exterit or
133YATK	Applied Theory of Structures	Z,ZK	4
ı	n to theoretical approaches to the effects of creep and shrinkage on structures. Principles of time-dependent analysis. Methods for the a	' '	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
	subject will be selected problems from the following areas: Reinforcement of discontinuities of reinforced concrete structures. Introdu ete structures. Preparation of input data for numerical models. Design of structures using MATLAB. Presentation of selected program		- 1
reiniorcea concre	ete structures. Preparation of input data for numerical models. Design of structures using MALLAB. Presentation of selected program structures.	is for the design of	concrete
133YPNB	Fire desgn og concrete and mnsory structures	Z	2
l l	ed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal ana		
	design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures	res.	
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		٠ ،
existing concrete	structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben-	ding moment and s	hear, and
422V//UD	foundation structures are discussed. The course appropriately combines theoretical approaches with common practice.	Z	2
133YVHB The aim of the cour	Ultrahigh Performance Concretes se is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin		_
	concrete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devote		
performance con	ncrete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the s	tudents can experi	ence the
	theoretical knowledge in practical use.		
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 jo		
134DPM	Diploma Thesis	Z	30
•	mber 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		s. A study
134O02C	Steel Structures 2C	Z,ZK	4
	ledge received from courses 133NNK and 1340K01. Amplifying of theoretical knowledge in the field of steel grade selection, toughness		
· -	al systems, joint classification, and high strength steel and demanding composite steel and concrete structures. Complementation of k	-	
of steel and compos	site structures and detailed design of industrial buildings and crane girders. Design of masts, towers, chimneys, tanks, silos and pipel	lines, technological	structures,
	pre-stressed steel structures and basis of design from aluminium alloys and stainless steel, and cable and membrane structu		
134P03C	Structural Design 3C	KZ	5
Design of steel / tim	sher load bearing building structure according to external requirements in relation to interaction of load bearing and final completion si is assigned by the seminar leader.	tructural elements.	The project
134P04C	Structural Design 4C	KZ	5
	ber load bearing building structure according to external requirements in relation to interaction of load bearing and final completion s		_
· ·	is assigned by the seminar leader.		, ,
134YDKM	Timber structures and bridges	Z	2
	ocused to national strategy of sustainable development. New timber-based materials. Structural systeme of houses and bridges. Rep		tening. Fire
	design. Production, protection, erection and maintenance. Design and evaluation of bridges, roofs structures in normal temperature		
134YHNK	Stainless steel and aluminium structures	Z Z	2
=	rs two parts: the first concerns design of structures from aluminium alloys, the second deals with stainless steel structures. Structures of 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		
	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
-	actures. Creation of numerical models for assessment of internal forces and deformations for main different roof systems and structures	-	
and behaviour of m	nain individual elements and their design. Historic structures and their reconstruction. Designing typical structural details based on ca	rpentry joints. We v	vill discuss
134YNSK	also using modern methods of joining elements of timber structures.	Z,ZK	2
l l	Design of Glass Structures nded for students of the master's program Civil Engineering, deepens the knowledge acquired in the subject 134YNKS. Extension of	, ,	
	lass beams, columns and walls. Principles of designing structural elements made of glass according to normative documents, experi		- 1
, ,	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		
134YROK	Extending the Life of Steel and Timber Structures	Z	2
	earing structures. Developments in the area of regulations and standardization. Causes of defects, malfunctions, survey of objects, static	· · · · · · · · · · · · · · · · · · ·	
Possibilities of str	engthening, strengthening of steel and timber structures and strengthening of connections. Using of computers in reconstructions an models.	na aevelopment of r	numerical
134YSMK	Stability and modelling of steel structures	Z	2
	ers two parts. The first one deals with stability and strength of steel plates, the second one with stability and strengths of steel frame		
-	f steel structures are analysed including the importance of imperfections for a design of thin plated structures. Presented are principle		
and nonlinear the	eory of buckling of thin plates. The results are applied to the 4th class cross sections in harmony with Eurocode. Buckling due to norm	nal, shear and local	loadings
including their comb	pination is analysed in a detail. In the end the application of the results is shown together with design of necessary stiffeners. The second	and part is focused	on member

and structure stat	oility. 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.	nbers. In detail, spe	ecific cases
134YSOD	Connections of steel and timber structures	Z	2
	The subject allows insight and ability to apply the knowledge related to structural connections and its application by softwar		_
134YSOK	Special steel structures	Z	2
Crane supporting	structures - actions, design, detailing. Silos - actions, behaviour, silos with rigid and non-rigid section. Masts - division, detiling, desig	n. Cable roofs - pr	ocedure of
135DPM	Diploma Thesis	Z	30
	sis, the student deals with a topic chosen by the department from those regularly announced by the department. It addresses, for exa	_	
•	uction of geotechnical structures, civil engineering structures, special foundations for industrial, transport, housing and water managen		
g	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis proje		
135P03C	Structural Design 3C	KZ	5
	Design, static calculation and drawing documentation of the building substructure		Į.
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
	I ainted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on intr	i oducing 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 g	geotechnica
applications, mater	rial models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. Th	is knowledge is fur	ther 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	e 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	esign of deep foundations, negative casing friction of drilled piles, grouting (calculations and execution), construction pits, improvement	nt of foundation so	ils.
210YDSM	Diagnostics of Building Materials Properties	Z	2
Failures of build	ing materials, mechanical, thermal, chemical and other influences on the development of failures of building materials. Diagnostics of	their occurrence.	Basics of
experimental mea	surement and instrumentation of tested elements and structures. Theory of experiment, measurement and processing of results. Test	ing machines and	equipment.
Deformation mea	asuring instruments. Destructive testing of mechanical properties. Non-destructive test methods. Test methodology for various materia	ls (concrete, morta	ar, metallic
	elements, wood, glass, plastics, composites and others).		
210YSB	Special Concretes	Z	2
This course is air	med at expanding knowledge in the field of special concretes and composites for specific applications. The core of the course is to accept the course is acceptable to the course is to accept the course is acceptable to	quaint students wit	th both the
technological aspe	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	ific practica
	applications and experiences are also presented within the course.		

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2024-05-20, time 01:30.