Study plan

Name of study plan: Stavební Inženýrství - konstrukce a dopravní stavby, specializace Dopravní stavby a geotechnika

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Civil Engineering - Structural and Transportation 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: 18

The role of the block: Z

Code of the group: NK20230100

Name of the group: Stavební Inženýrství - konstrukce a dopravní stavby, spole ná ást, 1. semestr

Requirement credits in the group: In this group you have to gain at least 14 credits

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

Credits in the group: 14 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
101NRDR	Numerical Solution of Differential Equations Petr Mayer, Ivana Pultarová, Jozef Bobok Petr Mayer Ivana Pultarová (Gar.)	Z,ZK	4	2P+2C	Z	Z
132NAK	Numerical Analysis of Structures Bo ek Patzák, Martin Horák Bo ek Patzák Bo ek Patzák (Gar.)	Z,ZK	5	2P+2C	Z	Z
135GET	Geotechnics Jan Pruška, Jan Kos, Matouš Hilar, Alexandr Butovi , Jan Masopust Jan Pruška Jan Pruška (Gar.)	Z,ZK	5	2P+2C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=NK20230100 Name=Stavební Inženýrství - konstrukce a dopravní stavby, spole ná ást, 1. semestr

101NRDR	Numerical Solution of Differential Equations	Z,ZK	4						
After elementary tools	After elementary tools of linear algebra (matrix, determinant, Gaussian elimination) are recalled, iterative methods for solving systems of linear algebraic equations are in the focus.								
Then, the finite differen	Then, the finite difference method and the finite element method are presented and their applications to problems based on differential equations are shown. Attention is also paid to								
basic methods for solvi	ng initial value problems in ordinary differential equations.								
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.							
135GET	135GET Geotechnics Z,ZK 5								
Familiarization with specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and the use of methods									
of their static assessme	f their static assessment.								

Code of the group: NK20230200

Name of the group: Stavební Inženýrství - konstrukce a dopravní stavby, spole ná ást, 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:

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	
132EANK	Experimental Analysis and Diagnostics K Michal Polák	KZ	4	1P+2C	L	Z	

Characteristics of the courses of this group of Study Plan: Code=NK20230200 Name=Stavební Inženýrství - konstrukce a dopravní stavby, spole ná ást, 2. semestr

132EANK Experimental Analysis and Diagnostics K

ΚZ

4

Experiments focused on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostics of building and engineering structures, tests carried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wind tunnel simulations of wind effects, static load tests on physical models), monitoring of building and engineering structures, static load tests (building structures, engineering structures, bridges), dynamic load tests and experimental modal analysis (building structures, engineering structures, bridges), effects of technical seismicity, evaluation of adverse effects of vibration on the human body, assessment of the influence of building vibrations on installed machines and devices).

Name of the block: Compulsory courses in the specialization

Minimal number of credits of the block: 32

The role of the block: PS

Code of the group: NK20230102

Name of the group: specializace Dopravní stavby a geotechnika, 1. semestr

Requirement credits in the group: In this group you have to gain at least 14 credits

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

Credits in the group: 14 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
135DYGK	Dynamics of geotechnical structures Jan Pruška Jan Pruška (Gar.)	Z,ZK	4	2P+1C	Z	PS
136S03D	Road construction 3D Michal Uhlík Michal Uhlík Michal Uhlík (Gar.)	Z,ZK	5	2P+2C	Z	PS
137Z02D	Railway structures 2D Lenka Lomoz, Leoš Horní ek, Hana Krej i íková Lenka Lomoz Leoš Horní ek (Gar.)	Z,ZK	5	2P+2C	Z	PS

Characteristics of the courses of this group of Study Plan: Code=NK20230102 Name=specializace Dopravní stavby a geotechnika, 1. semestr

135DYGK Dynamics of geotechnical structures	Z,ZK	4
The course builds on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the	letermination of the	loading of
geotechnical structures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including	the procedures for	determining
these properties by addition, the atticlent will leave the basic properties for appearing the officers of technical eximinity and controlled an appearance	ad acceptation of	ulaturaa (alah

geotechnical structures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the procedures for determining these properties. In addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected geotechnical structures (slab foundations, frame and retaining walls, embankments, slopes, tunnels).

136S03D | Road construction 3D | Z,ZK | 5 | Introduction to urban engineering, solutions in built-up areas - reconstruction. Parking - solution methods, technical parameters and requirements, garages. Bus stations and bus stops.

Public mass transport and its preferences. Pedestrian and bicycle traffic signs. Adaptations for the blind and partially sighted, barrier-free adaptations. Utilities.

137Z02D Railway structures 2D Z,ZK 5
Track design of individual types of railway stations, structural elements of railway stations, equipment for passenger and freight transport, connection to the European railway network, modernisation and optimisation of railway lines, design of tram and metro lines, ecological impacts of rail transport.

Code of the group: NK20230202

Name of the group: specializace Dopravní stavby a geotechnika, 2. semestr

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

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

Credits in the group: 18 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
133B03D	Concrete Structures 3D Roman Lenner	Z,ZK	5	2P+2C	L	PS
134O02D	Steel Structures 2D Martina Eliášová	Z,ZK	5	2P+2C	L	PS

136S04D	Road construction 4D Jan Valentin	Z,ZK	4	2P+1C	L	PS	
137Z03D	Railway Structures 3D Vit Lojda	Z,ZK	4	2P+1C	L	PS	

Characteristics of the courses of this group of Study Plan: Code=NK20230202 Name=specializace Dopravní stavby a geotechnika, 2. semestr

133B03D	Concrete Structures 3D	Z,ZK	5
Concrete structures with	n a focus on infrastructure		•
134O02D	Steel Structures 2D	Z,ZK	5

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.

136S04D Road construction 4D

Z,ZK

Course 13604D is the final professional course for students who have chosen to specialization in road construction. The course deepens the knowledge previously acquired in the field of technologies and technical solutions of road structures including pavements and extends it to other special or otherwise specific technologies. The student will be introduced to key technologies for asphalt pavements, concrete pavements, stone paved pavements and bridge pavements.

137Z03D Railway Structures 3D

Z,ZK

4

The subject is aimed at a detailed introduction to the construction and maintenance of railway lines. Students are introduced to working procedures and mechanization tools that are used for the construction of the railway bottom and top and for the establishment and maintenance of the geometrical position of the track.

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 6

The role of the block: PV

Code of the group: NK20230100_1

Name of the group: Stavební Inženýrství - konstrukce a dopravní stavby, PV p edm ty, 1. semestr

Requirement credits in the group: In this group you have to gain at least 2 credits

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

Credits in the group: 2

Note on the group:

povinně volitelný předmět

note on the group). povirine voilteir	iy predifiet				
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)	Completion	Credits	Scope	Semester	Role
	Tutors, authors and guarantors (gar.) Solid State Physics in Civil Engineering	_				
102YFPL	Ji í Konfršt Ji í Konfrš t Ji í Konfršt (Gar.)	Z	2	1P+1C	Z	PV
132YDDS	Dynamics of Transport Structures Michal Polák Michal Polák Michal Polák (Gar.)	Z	2	1P+1C	Z	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 (Gar.)	Z	2	1P+1C	Z	PV
133YBEX	Concrete under Extreme Conditions Radek Štefan	Z	2	1P+1C	Z	PV
133YBM2	Concrete Bridges 2 Jan Vítek Jan Vítek Jan Vítek (Gar.)	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 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 (Gar.)	Z	2	1P+1C	Z	PV
135YGSM	Geotechnical Software for Numerical modelling Jan Ježek, Daniel Turanský, Jan Salák, Alena Zemanová Alena Zemanová Alena Zemanová (Gar.)	Z	2	1P+1C	Z	PV
135YZAL	Basics of mining Ji í Barták Ji í Barták	Z	2	1P+1C	Z	PV
136YEES	Environmental Aspects and Esthetics of Road Structures Ludvík Vébr, Karel Horní ek Michal Uhlík Karel Horní ek (Gar.)	Z	2	1P+1C		PV
136YLET	Airports Petr Pánek Petr Pánek (Gar.)	Z	2	1P+1C	Z	PV
137YDKP	Diagnostics of rail transport construction Hana Krej i íková Lenka Lomoz Hana Krej i íková (Gar.)	Z	2	1P+1C	Z	PV

220YLPG	Geotechnical laboratory Ji í Svoboda, Ji í Šástka, Radek Vaší ek Radek Vaší ek Ji í Svoboda (Gar.)	Z	2	2C	Z	PV
Characteristics of th stavby, PV p edm ty	ne courses of this group of Study Plan: Code=NK20230100_1 Namer.	ne=Stavebn	í Inženýr	ství - kor	nstrukce a	a dopravní
102YFPL S	olid State Physics in Civil Engineering				Z	2
	tomic shell theory, valence layer chemical bonds, dislocation disturbances, critical crack e			-		
•	ics concepts of fracture mechanics, types of fracture, electron microscopes, scanning tur p-n junction, photovoltaic effect, solar cells, heat and moisture transport.	nneling microsco	pe, atomic f	orce microso	cope, diffracti	on, diffraction
	Dynamics of Transport Structures				Z	2
	ems of the Dynamics of transport structures (especially of road bridges, railway bridges ar	nd footbridges), e	xplanation o	ا of experimen	_	-
•	ent of an experiment "in situ?, monitored parameters, measuring line, modal analysis, the				_	-
	w characteristics, numerical methods for solving dynamical interaction between building s	structure and mo	ving load, m	odelling of s	structures, tra	iffic flow and
	nd effects, practical examples. Modern Methods of Optimization				7	2
The course is aimed at an o	overview of numerical optimization methods applicable not only in the Civil Engineering are ions in MATLAB environment are also conducted during exercises.	a.The emphasis	is put more	l on the introd	_	
	eismic Engineeering				Z	2
· · · · · · · · · · · · · · · · · · ·	of earthquake resistant structures. Methods of calculating the response of structures to e	arthquake loads	according to	Eurocode		
,	teliability of Structures he reliability of elements and systems. Element reliability is time dependent while the relia	ability of evetame	is of type s	trenath-load	Z	d cases are
	od. Two simulation methods are introduced: Monte Carlo and LHS.	ibility of Systems	is or type s	irengin-load	. Complicated	ı cases are
-	Concrete under Extreme Conditions				Z	2
The course is focused on o	concrete and concrete structures under extreme conditions.			'	<u>'</u>	
	Concrete Bridges 2				Z	2
	norrete bridges. The technologies of bridge construction represent main part of the study.	Specifications of	f individual s	structural sys	stems.	
1	ailures and Rehabilitation of Concrete Structures description of failures of concrete structures, explanation of the causes of these failures	and the design of	of remedial r	neasures M	Z lethods of str	2 renathenina
	s are also discussed. Surface repairs, strengthening of contactors, strengthening of struc	•				
foundation structures are o	discussed. The course appropriately combines theoretical approaches with common prac-	tice.		_		
	imber structures and bridges				Z	2
	to national strategy of sustainable development. New timber-based materials. Structural			ges. Repairir	ng and streng	thtening. Fire
	tion, erection and maintenance. Design and evaluation of bridges, roofs structures in norm Extending the Life of Steel and Timber Structures	nai temperature	and in lire.		7	2
	structures. Developments in the area of regulations and standardization. Causes of defects,	malfunctions, sur	vey of objec	l ts, static ass	umptions of r	_
Possibilities of strengthening	ng, strengthening of steel and timber structures and strengthening of connections. Using	of computers in	reconstructi	ons and dev	elopment of	numerical
models.						
	stability and modelling of steel structures parts. The first one deals with stability and strength of steel plates, the second one with s	tability and stron	athe of etoo	l framo etru	Z	2 first part the
•	structures are analysed including the importance of imperfections for a design of thin plat	•	•			•
	ckling of thin plates. The results are applied to the 4th class cross sections in harmony wi				-	-
	is analysed in a detail. In the end the application of the results is shown together with des					
•	sible global analysis methods are presented together with methods for compression and pare explained including also tapered members.	bending interacti	on for slend	er members	. In detail, sp	ecific cases
	Geotechnical Software for Numerical modelling				Z	2
	vith the Finite Element Method, the currently dominant tool for numerical modeling in Geo	technics. Empha	sis is placed	ı d on introduc	_	
	and their subsequent application to selected problems of Geotechnical Engineering. The c					-
	els suitable for the description of soil deformation, and selected specifics associated with n ion, embedded walls, and stability problems.	umerical modelir	ng in geotecl	nnics. This ki	nowledge is f	urther applied
	tasics of mining				Z	2
ı	rrying course introduces students to all the essential aspects of aggregate mining, an impo	rtant part of the r	national eco	ا nomy, in a co		
way. Aggregates extracted	and processed in various ways are essential raw materials for most construction industri	es.				
	invironmental Aspects and Esthetics of Road Structures				Z	2
	al terms, Laws 114/1991 and 100/2000, Detailed description of the EIA process from the	•		_		
	se from traffic and anti-noise measures, emissions and immissions from traffic, historical asing traffic intensity and decreasing emissions from better-quality vehicles, animal migra	· ·	15			
•	categories and owners, functioning of municipal and city authorities, competence of may		-	_		
	ges and risks transition to electric cars, technical, economic and environmental aspects a					
	Republic, basics of automobile traffic modeling, aesthetics of off-road road design, landso on mistakes in proposals, risks of ill-advised acceptance of data from CRMV for transport			-		
= :	erences between static and dynamic composition in the data.	ex riumbers, the	principle of	determini	j ilie dyllallii	5 composition
136YLET A	irports				Z	2
	tion, data about airports, legislature, choice notions, movement of aeroplanes, flight and to		_	itude RWY,a	erodrome co	de, geometric
	N, protective zone, visual aids, traffic processes at the airport, structureof terminals and a	aprons, proposal	airport.	1	7	
	Diagnostics of rail transport construction track - Czech regulation 177/1995 as amended, regulations for assessing the operability	of the lines mea	ns of disanc	etics of the	Z railway suner	2
-	ture - ballast bed. Measurement of other track parameters. Examples of defects and shor		-		ranway super	on dotale alla
220YLPG G	Seotechnical laboratory				Z	2
	tical exercise on geotechnical tests in laboratory and in-situ activities (The Josef undergr					-
determination of soil and re	ock parametres neccessary for geotechnical calculations and design - basic physical and	hydrophysical p	roperties, st	rength and	deformation p	parametres.

Code of the group: NK20230200_1

Name of the group: Stavební Inženýrství - konstrukce a dopravní stavby, 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:

povinně volitelné předměty

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
101YMCD	Methods of Time Discretization	Z	2	1P+1C	L	PV
101YMST	Mathematical statistics for technicians	Z	2	1P+1C	L	PV
101YNUM	Numerical Methods Ivana Pultarová	Z	2	1P+1C	L	PV
126YBIM	Building Information Modelling - Fundamentals	Z	2	2C	L	PV
132YDSK	Diagnostics of Building Structures Michal Polák	Z	2	1P+1C	L	PV
132YMCK	Micromechanics of Cement-Based Composites	Z	2	1P+1C	L	PV
132YNAK	Nonlinear Analysis of Materials and Structures	Z	2	1P+1C	L	PV
132YNA2	Numerical Analysis of Structures 2 Bo ek Patzák	Z,ZK	4	2P+1C	L	PV
132YPM2	Computer Analysis of Structures 2 Ji í Máca	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
133YPMM	Parametric Bridge Design	Z	2	2C	L	PV
133YPNB	Fire desgn og concrete and mnsory structures Radek Stefan	Z	2	1P+1C	L	PV
133YRZM	Reconstruction and strengthening of bridges Michal Drahorád	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 Zden k Sokol	Z	2	1P+1C	L	PV
134YSOD	Connections of steel and timber structures	Z	2	1P+1C	L	PV
134YSOK	Special steel structures Jakub Dolejš	Z	2	1P+1C	L	PV
135YGEM	Geotechnical monitoring Jan Záleský	Z	2	1P+1C	L	PV
135YMPK	Mechanics of underground structures Alexandr Butovi	Z	2	1P+1C	L	PV
135YZKS	Soil structures Ivan Vaní ek	Z	2	1P+1C	L	PV
136YMVZ	Pavement mechanics Ludvík Vébr	Z	2	1P+1C	L	PV
136YPPK	Intersection Highway Design Jaromíra Ježková	KZ	2	2C	L	PV
137YAZS	Project - Progressive application of substructure Vít Lojda	KZ	2	2C	L	PV
137YEAD	Ecological Aspects of Transport Lenka Lomoz	Z	2	1P+1C	L	PV

Characteristics of the courses of this group of Study Plan: Code=NK20230200_1 Name=Stavební Inženýrství - konstrukce a dopravní stavby, PV p edm ty, 2. semestr

101YMCD	Methods of Time Discretization	Z	2		
The course is devoted t	The course is devoted to a universal and very effective method for solving problems involving time, the so-called evolutionary problems, especially for				
a time variable. This me	ethod represents a modern approach to modeling and solving engineering tasks. These problems, both linear and non-linear,	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	Inferential statistics. Theory of probability. Random variables and its characteristics. Basic methods of mathematical statistics.				
101YNUM	Numerical Methods	Z	2		
Numerical computing in	n applied mathematics: course for heginners	•	•		

126YBIM	Building Information Modelling - Fundamentals	Z	2
	ling Information Modeling (BIM) topic as with the modern tool for management and operation of construction projects. It is ori	_	
•	it, Autodesk Navisworks) and especially to understanding meaning of BIM in current construction business and its future and	importance in sp	ecific phases of
construction projects. 132YDSK	Diagnostics of Building Structures	Z	2
132YMCK	Diagnostics of Building Structures Micromechanics of Cement-Based Composites	Z	2
-	n the basis of today's civilization and construction industry; traditional concrete is now the most produced material in the worl	_	_
•	ar. The properties of these composites can be changed in a wide range according to needs - compressive strength up to 800 l	_	
	ices or the formation of cracks. The subject presents a multi-scale description of these cement composites, from the atomic le	· · · · · · · · · · · · · · · · · · ·	- 1
It includes an overview of	of experimental methods used to identify properties, analytical and numerical methods for modeling hydration, heat transfer, el	asticity, creep and	strength across
	tion. The subject is supplemented by a whole range of engineering applications on which these methods have been successful		
	ctures (arches with cooling, foundation blocks, guide faces of dams), cement concrete highway covers with extended durability, s		
	calcium sulphide binders, innovative crack-resistant materials, alkali-activated fly ash. Most of the used numerical models hat DOFEM, which you can freely use, for example, for your prediction of temperatures during hydration, stress and crack analysis		
reinforcement and boun		s including the init	luerice of
132YNAK	Nonlinear Analysis of Materials and Structures	Z	2
	ainted with the concepts of linear stability and calculation of elastoplastic load capacity. Linear stability - evaluation of the criti		
•	ccording to the 2nd order theory - equilibrium conditions on a deformed structure, initial stress matrix. Elastoplastic analysis of		
load capacity, distributio	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
	ite element method. Formulation of plate elements suitable for thin and thick plates, plates on elastic foundation. Introduction to	o nonlinear proble	ms: 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 analys	sis of structures.
Verification of results.	Conoral Dringiples of Machanics	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 contir		
	walls and three-dimensional bodies.		
133YATK	Applied Theory of Structures	Z,ZK	4
	theoretical approaches to the effects of creep and shrinkage on structures. Principles of time-dependent analysis. Methods for t		-walled concrete
structures, stability theo	ry.		
133YPMM	Parametric Bridge Design	Z	2
133YPNB	Fire desgn og concrete and mnsory structures	Z	2
	n fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal	analysis, loads, d	esign principles,
	al properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures.		_
133YRZM	Reconstruction and strengthening of bridges	Z	2
	the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation and str		
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 the ete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devo		-
	the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the		
theoretical knowledge in			
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 all	
and practice in designin	g of aluminium structures. Structures of stainless steel: Evolution of stainless steel materials/structures and examples of real	ized structures. S	tainless steels
	re described in a detail, including their properties. Dissimilarities in assessments of members under common loadings with re	•	
	ate and serviceability limit states. In the end the possibilities concerning connections of stainless steel members, erection an	d installation of st	ainless steel
members are described		7	
134YNDK	Load-bearing timber roof constructions es. Creation of numerical models for assessment of internal forces and deformations for main different roof systems and struct	Z Z	2
•	es. Cleation of numerical models for assessment of internal ofces and deformations for main unierent foor systems and structur ndividual elements and their design. Historic structures and their reconstruction. Designing typical structural details based on	•	
	nods of joining elements of timber structures.	carpoint y jointo.	We will alcoude
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		
field of stability of glass	beams, columns and walls. Principles of designing structural elements made of glass according to normative documents, ex	perimental verifica	ation of material
properties of glass, safe	ety 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 introduc	ction 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
	ht and ability to apply the knowledge related to structural connections and its application by software.		
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.			
135YGEM	Geotechnical monitoring	Z Z	2
-	and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assura d data for back analyses and modelling of field performance.	nce. Relation bety	veen application
135YMPK	Mechanics of underground structures	Z	2
	Mechanics of underground structures ation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The cou		=
	nstruction and provides practical experience in the design and implementation of underground structures. The student tries ou	-	- 1
_	nel project. An integral part of the course is also an excursion to a completed underground construction in Prague.		

135YZKS	Soil structures	Z	2	
Principles of soil struct	ures design			
136YMVZ	Pavement mechanics	Z	2	
Rise and development	of road pavement mechanics, fundamental data for designing, characteristics of traffic load, thermic and water relation of sub-	base,load-bearing	capacity of	
subgrade, road pavem	ent materials, pavement design methods - partition, development and possibilities. Stress and transformation analysis on roa	d pavement constr	uction and	
subgrade, pavement d	esign specificity for different constructional types, road pavements with special loads.			
136YPPK	Intersection Highway Design	KZ	2	
Design of interchange.	Based on capacity assessment, evaluation of the most suitable form of interchange and its design processing. Roundabout of	lesign.		
137YAZS	Project - Progressive application of substructure	KZ	2	
The content of the sub	ect is focused on the presentation of the latest knowledge and results of research and development in the field of railway unc	lercarriage, which	have not yet	
entered into common p	practice or the regulatory base in the Czech Republic. It complements and expands students' knowledge from basic subjects a	Z01, Z02 and Z03.		
137YEAD	Ecological Aspects of Transport	Z	2	
Negative impacts of noise and vibration on human. Assessment of varied transport noise Acoustic levels. Noise maps. Noise study. Traffic noise characteristics of different transport				
means. Propagation of	noise. Ways of environment protection before adverse impacts of transport noise (urban, architectural, traffic-organizing, tech	nnical).		

Name of the block: Povinn volitelné p edm ty, doporu ení S4

Minimal number of credits of the block: 4

The role of the block: S4

Code of the group: NK20230200_2

Name of the group: Stavební inženýrství - konstrukce a dopravní stavby, diplomový seminá

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:

xxxDISE Diplomový seminář

note on the group	J. AMDIOL DIPIOI	novy commu				
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
101DISE	Diploma Seminar Jozef Bobok	Z	4	4C	L	S4
132DISE	Diploma Seminar Aleš Jíra	Z	4	4C	L	S4
133DISE	Diploma Seminar Lukáš Vráblík	Z	4	4C	L	S4
134DISE	Diploma Seminar Michal Jandera Pavel Ryjá ek (Gar.)	Z	4	4C		S4
135DISE	Diploma Seminar Jan Pruška	Z	4	4C	L	S4
136DISE	Diploma Seminar Petr Mondschein	Z	4	4C		S4
137DISE	Diploma Seminar Lenka Lomoz	Z	4	4C	L	S4
210DISE	Diploma Seminar	Z	4	4C		S4
220DISE	Diploma Seminar Radek Vaší ek	Z	4	4C		S4

Characteristics of the courses of this group of Study Plan: Code=NK20230200_2 Name=Stavební inženýrství - konstrukce a dopravní stavby, diplomový seminá

stavby, diplomo	vý seminá		
101DISE	Diploma Seminar	Z	4
Please contact your t	eacher or guarantor of this subject.		
132DISE	Diploma Seminar	Z	4
The course precedes	the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on	the agreement of	the teacher and
the student. The vast	majority of assignments are connected with the scientific and research activities of the respective employee. The output of the	solution may be a	brief research
study of the given pro	blem, experimental activity, programming and others according to the respective assignment.		
133DISE	Diploma Seminar	Z	4
The topic of the assignment	nment is individual, mostly related to the expected topic of the Diploma Thesis.		
134DISE	Diploma Seminar	Z	4
Semestral project of	master study.		
135DISE	Diploma Seminar	Z	4
Deepening of knowle	dge in the field according to the choice of the assignment as preparation for the Diploma Thesis, study of specialized literature and	knowledge from in	mplementations,
preparation of theore	tical research and variant solutions, or preparation for the implementation of an experimental program.		
136DISE	Diploma Seminar	Z	4
Preparation of the ba	sic documents for the assignment of a master thesis and their processing. Lectures by experts from the practice (road design, co	onstruction techno	logy, information
about new procedure	s and software)		
137DISE	Diploma Seminar	Z	4
After agreement with	the teacher, a preliminary thesis topic is determined. The student should responsibly prepare for the creation of the work itself by	studying the doci	uments, creating
research, and obtain	ng background materials (e.g. maps). Furthermore, he should determine the outline of the work and master the work with any	measuring technic	ue, etc.

210DISE	Diploma Seminar	Z	4
Preparatory works on di	ploma thesis elaboration. Literature review, study on problematics to be solved - practical cases in geotechnical laboratory and	the Josef underg	round laboratory
(http://ceg.fsv.cvut.cz).			
220DISE	Diploma Seminar	Z	4
Preparatory works on di	ploma thesis elaboration. Literature review, study on problematics to be solved - practical cases in geotechnical laboratory and	the Josef underg	round laboratory

Name of the block: Povinn volitelné p edm ty, doporu ení S1

Minimal number of credits of the block: 30

The role of the block: S1

(https://www.stolajosef.cz).

Code of the group: NK20230300

Name of the group: Stavební Inženýrství - konstrukce a dopravní 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
101DPM	Diploma Thesis Daniela Jarušková, Michal Beneš, Milan Bo ík, Jakub Šolc Michal Beneš Daniela Jarušková (Gar.)	Z	30	24C	Z	S1
132DPM	Diploma Thesis Bo ek Patzák, Martin Horák, Michal Polák, Mat j Lepš, Jan Zeman, Ji í Máca, Jan Sýkora, Martin Došká, Tomáš Janda, Aleš Jíra	Z	30	24C	Z	S1
133DPM	Diploma Thesis Martin Tipka	Z	30	24C	Z	S1
134DPM	Diploma Thesis 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
136DPM	Diploma Thesis Petr Mondschein	Z	30	24C	Z	S1
137DPM	Diploma Thesis Lenka Lomoz Leoš Horní ek (Gar.)	Z	30	24C	Z	S1
210DPM	Diploma Thesis Michal Mára, Jan Zatloukal, Radoslav Sovják, Jind ich Forn sek, Ji í Litoš Ji í Litoš Ji í Litoš (Gar.)	Z	30	24C	Z	S1
220DPM	Diploma Thesis Ji í Svoboda, Radek Vaší ek Ji í Svoboda Ji í Svoboda (Gar.)	Z	30	24C	Z	S1

Characteristics of the courses of this group of Study Plan: Code=NK20230300 Name=Stavební Inženýrství - konstrukce a dopravní stavby, diplomová práce

101DPM	Diploma Thesis	Z	30			
Please contact your tea	cher or guarantor of this subject.	•	'			
132DPM	Diploma Thesis	Z	30			
In accordance with the	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 completi	on 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 individual	ly.				
135DPM	Diploma Thesis	Z	30			
In the diploma thesis, the	ne student deals with a topic chosen by the department from those regularly announced by the department. It addresses, for	example, problem	is related to the			
design and construction	of geotechnical structures, civil engineering structures, special foundations for industrial, transport, housing and water mana	gement structure	s, earth and rock			

structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project.

136DPM Diploma Thesis The assigned topic of diploma theses can be a project, traffic surveys, research of selected issues with application in practice for various technical solutions of road structures, laboratory tests to verify the functionality of various materials for pavements, etc. In terms of design, the most common topics of theses are, for example, the design of a new construction or reconstruction of a selected section of a road (bypass, flyover), the design of a road network in a selected area of the city, the design of a new construction or reconstruction of intersections, the design of an airport, heliport, etc. In terms of pavement structures and road construction technologies, the most frequent topics of work are, for example, comparison

of different material solutions for asphalt or concrete pavements, including the relevant composite materials or input components (binders, aggregates, etc.), assessment of the behaviour of a particular material or type of structure by laboratory methods, or carrying out simulations, etc.

137DPM Diploma Thesis Z

The diploma thesis is the final complex work prepared by students at the end of their university studies. The diploma thesis describes the given issue in a broader context, in which the student demonstrates the ability to work independently and an engineering approach. The diploma thesis takes the form of either a project (reconstruction of a section of a railway line, study of new railway lines), a research (processing of an overview in a certain area) or a laboratory (including the execution and evaluation of specified laboratory tests), or a combined one.

210DPM	Diploma Thesis	Z	30	
Students will get the opportunity to organize complex process of experimental work from the beginning of production, experimental investigation to of the data. Thesis are designed to				
fit scientific and resear	fit scientific and research activity of the Experimental Centre			
220DPM	Diploma Thesis	Z	30	
Diploma thesis elabora	tion with possible use of geotechnical laboratory and underground facility the Josef underground laboratory (http://ceg.fsv.cv	ut.cz).		

List of courses of this pass:

Code	Name of the course	Completion	Credits
101DISE	Diploma Seminar	Z	4
·	Please contact your teacher or guarantor of this subject.	•	
101DPM	Diploma Thesis	Z	30
'	Please contact your teacher or guarantor of this subject.	•	'
101NRDR	Numerical Solution of Differential Equations	Z,ZK	4
After elementary too	ols of linear algebra (matrix, determinant, Gaussian elimination) are recalled, iterative methods for solving systems of linear algebra	aic equations are ir	the focus.
Then, the finite differ	rence method and the finite element method are presented and their applications to problems based on differential equations are sl	hown. Attention is	also paid to
	basic methods for solving initial value problems in ordinary differential equations.		
101YMCD	Methods of Time Discretization	Z	2
The course is devote	ed to a universal and very effective method for solving problems involving time, the so-called evolutionary problems, especially for pa	artial differential eq	uations wit
a time variable. This i	method represents a modern approach to modeling and solving engineering tasks. These problems, both linear and non-linear, moc	del events in many	engineerin
	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.		'
102YFPL	Solid State Physics in Civil Engineering	Z	2
	ture, atomic shell theory, valence layer chemical bonds, dislocation disturbances, critical crack energy,vibration of masses, systems	natural frequency	of vibratior
and damped vibration	n, basics concepts of fracture mechanics, types of fracture, electron microscopes, scanning tunneling microscope, atomic force mic	roscope, diffraction	n, diffractio
	methods, semiconductors, p-n junction, photovoltaic effect, solar cells, heat and moisture transport.		
126YBIM	Building Information Modelling - Fundamentals	Z	2
Subject deals with E	Building Information Modeling (BIM) topic as with the modern tool for management and operation of construction projects. It is orien	ted to handling ha	sic relevant
		tou to manding bu	
software (Autodesk F	Revit, Autodesk Navisworks) and especially to understanding meaning of BIM in current construction business and its future and im		
software (Autodesk F	Revit, Autodesk Navisworks) and especially to understanding meaning of BIM in current construction business and its future and im construction projects.		
software (Autodesk F			
132DISE	construction projects.	portance in specifi	ic phases o
132DISE The course precedes	construction projects. Diploma Seminar	portance in specification Z agreement of the	ic phases of teacher an
132DISE The course precedes	construction projects. Diploma Seminar s the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the	portance in specification Z agreement of the	teacher an
132DISE The course precedes	construction projects. Diploma Seminar s the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol	portance in specification Z agreement of the	teacher an
132DISE The course precedes the student. The vas	construction projects. Diploma Seminar s the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment.	Z agreement of the lution may be a bri	4 teacher an
132DISE The course precedes the student. The vas	construction projects. Diploma Seminar s the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis	Z agreement of the lution may be a bri	4 teacher an
132DISE The course precedes the student. The vas 132DPM	construction projects. Diploma Seminar s the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal.	Z agreement of the lution may be a bri	4 teacher an ef research
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse	construction projects. Diploma Seminar s the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K	Z agreement of the lution may be a bri Z KZ s of building and e	4 teacher an ef research 30 4 ngineering
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca	construction projects. Diploma Seminar s the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostics	Z agreement of the lution may be a bri Z KZ s of building and end tunnel simulation	4 teacher an ef research 30 4 ngineering ns of wind
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to	construction projects. Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wire	agreement of the lution may be a bri Z KZ s of building and end tunnel simulation tures, bridges), dyn	4 teacher an ef research 30 4 ngineering ns of wind namic load
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to	construction projects. Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures, static load tests (building structures, engineering structures, engineering structures, static load tests (building structures, engineering structures)	agreement of the lution may be a bri Z KZ s of building and end tunnel simulation tures, bridges), dyn	4 teacher an ef research 30 4 ngineering ns of wind namic load
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to	construction projects. Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wirests on physical models), monitoring of building and engineering structures, static load tests (building structures, engineering structures, bridges, footbridges), effects of technical seismicity, evaluation of a	agreement of the lution may be a bri Z KZ s of building and end tunnel simulation tures, bridges), dyn	4 teacher an ef research 30 4 ngineering ns of wind namic load
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to tests and experiment 132NAK	construction projects. Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures, static load tests (building structures, engineering structures) (model similarity laws, seismic simulations on shake tables, wirests on physical models), monitoring of building and engineering structures, static load tests (building structures, engineering structures) (model 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).	agreement of the lution may be a bri Z KZ KZ s of building and end tunnel simulation tures, bridges), dyldverse effects of v	4 teacher an ef research 30 4 engineering ns of wind namic load ibration on 5
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to tests and experiment 132NAK Variational princip	construction projects. Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wirests on physical models), monitoring of building and engineering structures, static load tests (building structures, engineering structures) intal 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). Numerical Analysis of Structures	agreement of the lution may be a bri Z KZ S of building and end tunnel simulation tures, bridges), dyldverse effects of v Z,ZK elements, area coce	4 teacher an ef research 30 4 engineering ns of wind namic load ibration on 5
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to tests and experiment 132NAK Variational princip	construction projects. Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wirests on physical models), monitoring of building and engineering structures, static load tests (building structures, engineering structural 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). Numerical Analysis of Structures Diploma Thesis In accordance with the thesis proposal. Experimental Analysis of Structures Numerical Analysis of Structures Diploma Thesis In accordance with the thesis proposal. Set of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric of the meaning structures of the meaning structures of the meaning structures.	agreement of the lution may be a bri Z KZ S of building and end tunnel simulation tures, bridges), dyldverse effects of v Z,ZK elements, area coce	4 teacher an ef research 30 4 engineering ns of wind namic load ibration on 5
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to tests and experiment 132NAK Variational princip numer 132YDDS	construction projects. Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wire sets on physical models), monitoring of building and engineering structures, static load tests (building structures, engineering structures) and model 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). Numerical Analysis of Structures Place of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric of crical integration. Application of method to selected 1D and 2D problems (Elasticity, heat transfer, consolidation). Algorithmic aspects	agreement of the lution may be a bri Z KZ s of building and e and tunnel simulation tures, bridges), dyndverse effects of v Z,ZK elements, area cooks of the method.	4 teacher an ef research 30 4 engineering ns of wind namic load ibration on 5 ordinates,
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to tests and experiment 132NAK Variational princip numer 132YDDS Understanding of the procedures - the array	construction projects. Diploma Seminar In the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wing tests on physical models), monitoring of building and engineering structures, static load tests (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). Numerical Analysis of Structures Possibles of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric of the integration. Application of method to selected 1D and 2D problems (Elasticity, heat transfer, consolidation). Algorithmic aspects Dynamics of Transport Structures Popoblems of the Dynamics of transport structures (especially of road bridges, railway bridges and footbridges), explanation of experimant and experiment "in situ?, monitored parameters, measuring line, modal analysis, the monitoring systems for observation	agreement of the lution may be a bri Z S of building and e and tunnel simulation tures, bridges), dyndverse effects of verse of the method. Z mental and theoret of building structure.	4 teacher an ef research 30 4 angineering ins of wind namic load ibration on 5 ordinates, 2 ical analysi re dynamic
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to tests and experiment 132NAK Variational princip numer 132YDDS Understanding of the procedures - the array	Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wirests on physical models), monitoring of building and engineering structures, static load tests (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). Numerical Analysis of Structures eles of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric of the integration. Application of method to selected 1D and 2D problems (Elasticity, heat transfer, consolidation). Algorithmic aspects Dynamics of Transport Structures reproblems of the Dynamics of transport structures (especially of road bridges, railway bridges and footbridges), explanation of expering angement of an experiment "in situ?, monitored parameters, measuring line, modal analysis, the monitoring systems for observation affice flow characteristics, numerical methods for solving dynamical interaction between building structure and moving load, modelling	agreement of the lution may be a bri Z S of building and e and tunnel simulation tures, bridges), dyndverse effects of verse of the method. Z mental and theoret of building structure.	4 teacher an ef research 30 4 ngineering ns of wind namic load ibration on 5 ordinates, 2 ical analysi re dynamic
132DISE The course precedes the student. The vasing the student of the student of the student. The vasing the student of the s	Diploma Seminar In the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wireless on physical models), monitoring of building and engineering structures, static load tests (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). Numerical Analysis of Structures eles of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric of the convergence in the problems of the Dynamics of transport structures (especially of road bridges, railway bridges and footbridges), explanation of experimant and experiment "in situ?, monitored parameters, measuring line, modal analysis, the monitoring systems for observation affic flow characteristics, numerical methods for solving dynamical interaction between building structure and moving load, modelling pedestrians, dynamical wind effects, practical examples.	agreement of the lution may be a bri Z S of building and e and tunnel simulation tures, bridges), dyndverse effects of verse of the method. Z mental and theoret of building structures, traf	4 teacher an ef research 30 4 engineering for wind namic load ibration on 5 ordinates, 2 ical analysi re dynamic flow and
132DISE The course precedes the student. The vas 132DPM 132EANK Experiments focuse structures, tests ca effects, static load to tests and experiment 132NAK Variational princip numer 132YDDS Understanding of the procedures - the array	Diploma Seminar Is the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wirests on physical models), monitoring of building and engineering structures, static load tests (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). Numerical Analysis of Structures eles of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric of the integration. Application of method to selected 1D and 2D problems (Elasticity, heat transfer, consolidation). Algorithmic aspects Dynamics of Transport Structures reproblems of the Dynamics of transport structures (especially of road bridges, railway bridges and footbridges), explanation of expering angement of an experiment "in situ?, monitored parameters, measuring line, modal analysis, the monitoring systems for observation affice flow characteristics, numerical methods for solving dynamical interaction between building structure and moving load, modelling	agreement of the lution may be a bri Z S of building and e and tunnel simulation tures, bridges), dyndverse effects of v Z Z/K elements, area cook of the method. Z mental and theoret of building structures of structures, traf	4 teacher an ef research 30 4 ngineering ns of wind namic load ibration on 5 ordinates, 2 ical analysize dynamic
132DISE The course precedes the student. The vasing the student of the student of the student. The vasing the student of the s	Diploma Seminar In the thesis and prepares students for writing their future thesis. The assignment of the final thesis is always individual based on the st majority of assignments are connected with the scientific and research activities of the respective employee. The output of the sol study of the given problem, experimental activity, programming and others according to the respective assignment. Diploma Thesis In accordance with the thesis proposal. Experimental Analysis and Diagnostics K and on monitoring of the amount of climatic loads on building and engineering structures (wind, snow, temperature loads), diagnostic arried out on physical models of building and engineering structures (model similarity laws, seismic simulations on shake tables, wireless on physical models), monitoring of building and engineering structures, static load tests (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). Numerical Analysis of Structures eles of mechanics. Method of weighted residuals, conditions of convergence (continuity, integrity). Principles of FEM. Isoparametric of the convergence in the problems of the Dynamics of transport structures (especially of road bridges, railway bridges and footbridges), explanation of experimant and experiment "in situ?, monitored parameters, measuring line, modal analysis, the monitoring systems for observation affic flow characteristics, numerical methods for solving dynamical interaction between building structure and moving load, modelling pedestrians, dynamical wind effects, practical examples.	agreement of the lution may be a bri Z S of building and e and tunnel simulation tures, bridges), dyndverse effects of verse of the method. Z mental and theoret of building structures, traf	4 teacher an ef research 30 4 engineering for wind namic load ibration on 5 ordinates, 2 ical analysi re dynamic flow and

Cement composites form the basis of today's civilization and construction industry; traditional concrete is now the most produced material in the world with an average consumption of over 1 m3 / person / year. The properties of these composites can be changed in a wide range according to needs - compressive strength up to 800 MPa, creep, shrinkage, resistance to environmental influences or the formation of cracks. The subject presents a multi-scale description of these cement composites, from the atomic level to the building structure level. It includes an overview of experimental methods used to identify properties, analytical and numerical methods for modeling hydration, heat transfer, elasticity, creep and strength across different levels of resolution. The subject is supplemented by a whole range of engineering applications on which these methods have been successfully used - designs and optimization of massive concrete structures (arches with cooling, foundation blocks, guide faces of dams), cement concrete highway covers with extended durability, sprayed concrete with replacement of Portland cement with calcium sulphide binders, innovative crack-resistant materials, alkali-activated fly ash. Most of the used numerical models have been implemented in the open-source software OOFEM, which you can freely use, for example, for your prediction of temperatures during hydration, stress and crack analysis including the influence of reinforcement and boundary conditions.

The course is aimed	Modern Methods of Optimization	Z	2
	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	n finite element method. Formulation of plate elements suitable for thin and thick plates, plates on elastic foundation. Introduction to no	onlinear problems:	geometrical
	and material nonlinearity, solution methods, implementation aspects.		
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		
	es according to the 2nd order theory - equilibrium conditions on a deformed structure, initial stress matrix. Elastoplastic analysis of str		
load capacity, distril	bution of internal forces at the limit state - static incremental method, kinematic method. Solving stability and elastoplasticity problems by	by means of a gene	ral-purpose
	finite element program.		
132YPM2	Computer Analysis of Structures 2	Z	2
Limit state of frame	s. Stability analysis of structures. Second order theory. Beams and gridwork girders on elastic foundation. Plate and wall structures.	Dynamic analysis o	f structures.
	Verification of results.	_	_
132YSEI	Seismic Engineeering	Z	2
	principles of design of earthquake resistant structures. Methods of calculating the response of structures to earthquake loads according	ing to Eurocode 8.	
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
	ial operators and their application in mechanics, Gauss and Green theorems. General structure of the basic equations of linear and r		
duality. Principle	of virtual work (power), variational principles (Lagrange, Castigliano, Hellinger-Reissner, Hu-Washizu) and their application to continu	uous and discrete i	models of
	beams, frames, plates, walls and three-dimensional bodies.		
133B03D	Concrete Structures 3D	Z,ZK	5
	Concrete structures with a focus on infrastructure		
133DISE	Diploma Seminar	Z	4
	The topic of the assignment is individual, mostly related to the expected topic of the Diploma Thesis.		
133DPM	Diploma Thesis	Z	30
· ·	In accordance with a thesis proposal.		
133YATK	Applied Theory of Structures	Z,ZK	4
Detailed introduction	n to theoretical approaches to the effects of creep and shrinkage on structures. Principles of time-dependent analysis. Methods for the a	analysis 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.		
133YBM2	Concrete Bridges 2	Z	2
Extension	n of the field of concrete bridges. The technologies of bridge construction represent main part of the study. Specifications of individua	l structural system	S.
133YPMM	Parametric Bridge Design	Z	2
			_
133YPNB	Fire desan og concrete and mnsory structures	7	2
133YPNB The course is focus	Fire desgn og concrete and mnsory structures sed on fire resistance of concrete and masonry structures; concrete and concrete structures exposed to fire, design rules, thermal and	Z	2
	Fire desgn og concrete and mnsory structures sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structu	Z alysis, loads, desig	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 design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures.	Z alysis, loads, designes.	2 n principles,
The course is focus 133YPRK	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures	Z alysis, loads, designes.	2 n principles, 2
The course is focus 133YPRK The course focuse	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures.	Z alysis, loads, designes. Z es. Methods of stre	2 n principles, 2 engthening
The course is focus 133YPRK The course focuse	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures so on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measures.	Z alysis, loads, designes. Z es. Methods of stre	2 n principles, 2 engthening
The course is focus 133YPRK The course focuse existing concrete	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures es on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice.	Z alysis, loads, designes. Z res. Methods of streding moment and seconds.	2 n principles, 2 engthening shear, and
The course is focus 133YPRK The course focuse existing concrete 133YRZM	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures es on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges	Z alysis, loads, designers. Z es. Methods of streding moment and street	2 n principles, 2 engthening shear, and
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures es on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation	Z alysis, loads, designers. Z res. Methods of streding moment and strengthening	2 n principles, 2 engthening shear, and 2
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures es on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes	Z alysis, loads, designers. Z res. Methods of streding moment and strengthening Z	2 n principles, 2 engthening shear, and 2
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the course	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures es on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation	Z alysis, loads, designers. Z res. Methods of streding moment and strengthening Z structures. The cor	2 n principles, 2 engthening shear, and 2 2 nponents of
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the course of the course of the course formance of the course of the	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures es on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin	Z alysis, loads, designers. Z res. Methods of streding moment and strengthening Z structures. The cored to the componer	2 n principles, 2 engthening shear, and 2 In ponents of onts of high
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the course of the course of the course formance of the course of the	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rise focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rise is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin econcrete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devoted.	Z alysis, loads, designers. Z res. Methods of streding moment and strengthening Z structures. The cored to the componer	2 n principles, 2 engthening shear, and 2 In ponents of onts of high
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the course of the course of the course formance of the course of the	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin econcrete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devoted accrete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the stheoretical knowledge in practical use.	Z alysis, loads, designers. Z res. Methods of streding moment and strengthening Z structures. The cored to the componer	2 n principles, 2 engthening shear, and 2 In ponents of onts of high
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the cour high performance cor	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation. Ultrahigh Performance Concretes rese is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin a concrete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devoted accrete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structures are design of concretes and strength and by laboratory exercises, where the strength and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the strength and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the strength and the method of manufacturing.	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z structures. The cored to the componer students can exper	2 n principles, 2 engthening shear, and 2 nponents of high ience the
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the cour high performance cor	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese 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 devoted the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the strength and project of master study. Diploma Seminar Semestral project of master study.	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z structures. The cored to the componer students can exper	2 n principles, 2 engthening shear, and 2 nponents of high ience the
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the cour high performance cor 134DISE 134DPM	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin econcrete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devote concrete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the stheoretical knowledge in practical use. Diploma Seminar	Z alysis, loads, designes. Z res. Methods of strending moment and strengthening Z structures. The cored to the componer students can experi	2 engthening shear, and 2 engonents of high ience the 4
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the cour high performance cor 134DISE 134DPM Design of steel / tr	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin econcrete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devoted increte, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structures are design of masonry bridges. Diploma Seminar Semestral project of master study. Diploma Thesis	Z alysis, loads, designes. Z res. Methods of strending moment and strengthening Z structures. The cored to the componer students can experi	2 engthening shear, and 2 engonents of high ience the 4
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the cour high performance cor 134DISE 134DPM Design of steel / to foci	set on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese 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 devoted and the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the 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	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can expering the structural elements or individually.	2 engthening shear, and 2 engonents of his of high ience the 30 ts. A study
The course is focus 133YPRK The course focuse existing concrete 133YRZM The course focuse existing concrete 133YVHB The aim of the course performance cors 134DISE 134DPM Design of steel / to focus 134O02D	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese 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 devoted increte, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structures is devoted and the method of manufacturing in practical use. Diploma Seminar Semestral project of master study. Diploma Thesis Imber load bearing building structure according to external requirements in relation to interaction of load bearing and final completion	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can experist a continuous control of the componer of the componer of the componer students can experist a continuous can experise can exper	2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the courligh performance cor 134DISE 134DPM Design of steel / to focus 134O02D Deepening of know	sed on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures as on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese is to present a special type of concrete that achieves great strength and high durability, which enables the realization of very thin exponents are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devote accrete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structure according to external requirements in relation to interaction of load bearing and final completion used on research of load bearing 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	Z alysis, loads, designes. Z res. Methods of strending moment and strengthening Z structures. The cored to the componer students can experiment and structural elements or individually. Z,ZK s, global analysis of	2 engthening shear, and 2 engonents of nts of high ience the 4 30 ts. A study 5 f structures,
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the cour high performance cor 134DISE 134DPM Design of steel / troce 134O02D Deepening of know buckling of structure	Failures and Rehabilitation of Concrete Structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures as on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese 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 devoted and the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structure the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structure the composition and the method of manufacturing and final completion. Diploma Seminar Semestral project of master study. Diploma Thesis 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 superist steel or research of load bearing structures may be also the topic of the ordinary concrete structures. Complementation of load structures and detailed design of industrial buildings and crane girders. Design of masts, towers, chi	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z structures. The cored to the componer students can experient and structural elements or individually. Z,ZK s, global analysis oknowledge from firelines, technological	2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5 f structures, e resistance
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the cour high performance cor 134DISE 134DPM Design of steel / troce 134O02D Deepening of know buckling of structure	read on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures as on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of being foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation of understanding of the present a special type of concrete that achieves great strength and high durability, which enables the realization of very thing concrete are presented and the main differences in composition of ordinary concrete and HPC. A large part of the lectures is devoted and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structure, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structure is project of master study. Diploma Seminar Semestral project of master study. Diploma Thesis 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 superist steel on research of load bearing structures may be also the topic of the the project. The project is assigned by a final project superist steel on the field of steel grade selection, toughnes all systems, joint classification, and high strength steel and demanding c	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z structures. The cored to the componer students can experient and structural elements or individually. Z,ZK s, global analysis oknowledge from firelines, technological	2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5 f structures, e resistance
The course is focus 133YPRK The course focuse existing concrete 133YRZM The cou 133YVHB The aim of the cour high performance cor 134DISE 134DPM Design of steel / troce 134O02D Deepening of know buckling of structure	Failures and Rehabilitation of Concrete Structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures and Rehabilitation of Concrete Structures as on the description of failures of concrete structures, explanation of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese 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 devoted and the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structure the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the structure the composition and the method of manufacturing and final completion. Diploma Seminar Semestral project of master study. Diploma Thesis 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 superist steel or research of load bearing structures may be also the topic of the ordinary concrete structures. Complementation of load structures and detailed design of industrial buildings and crane girders. Design of masts, towers, chi	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z structures. The cored to the componer students can experient and structural elements or individually. Z,ZK s, global analysis oknowledge from firelines, technological	2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5 f structures, e resistance
The course is focus 133YPRK The course focuse existing concrete 133YRZM The course focuse existing concrete 133YVHB The aim of the course performance corsection focus focu	red on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges ree focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes ree 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 corete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the stheoretical knowledge in practical use. Diploma Seminar Semestral project of master study. Diploma Thesis 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 Steel Structures 2D ledge received from courses 133NNK and 1340K01. Amplifying of theoretical knowledge in the field of steel grade selection, toughnes al systems, joint classification, and high strength steel and demanding composite steel and concrete structures. Complementation of pre-stressed steel structures and basis of design from aluminium alloys and stainless steel, and cable and membrane structures are str	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can experiate and strengthing and strengthings, technological stres. Z sairing and strengthings of structural st	2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5 f structures, e resistance I structures,
The course is focus 133YPRK The course focuse existing concrete 133YRZM The course focuse existing concrete 133YVHB The aim of the course formance corsection for the course formance corsection focus fo	red on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of Concrete Structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges ree focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation. Ultrahigh Performance Concretes ree 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 increte, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the subsequently acc	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can experiate and strengthing and strengthings, technological stres. Z sairing and strengthings of structural st	2 engthening shear, and 2 engonents of this of high ience the 4 30 ts. A study 5 f structures, e resistance I structures, and engage in the structures, and engage in the structures, and engage in the structures.
The course is focus 133YPRK The course focuse existing concrete 133YRZM The course focuse existing concrete 133YVHB The aim of the course performance corsection focus focu	red on fire resistance of concrete and masonry structures: concrete and concrete structures exposed to fire, design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of the causes of these failures and the design of remedial measur structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges ree focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes ree 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 corete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the stheoretical knowledge in practical use. Diploma Seminar Semestral project of master study. Diploma Thesis 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 Steel Structures 2D ledge received from courses 133NNK and 1340K01. Amplifying of theoretical knowledge in the field of steel grade selection, toughnes al systems, joint classification, and high strength steel and demanding composite steel and concrete structures. Complementation of pre-stressed steel structures and basis of design from aluminium alloys and stainless steel, and cable and membrane structures are str	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can experiate and strengthing and strengthings, technological stres. Z sairing and strengthings of structural st	2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5 f structures, e resistance I structures,
The course is focus 133YPRK The course focuse existing concrete 133YRZM The course 133YVHB The aim of the course high performance cors 134DISE 134DPM Design of steel / times focus 134O02D Deepening of known buckling of structure of steel and compo 134YDKM Timber structures for 134YHNK Subject YHNK cove	design methods, material properties of concrete and steel reinforcement at high temperatures, fire design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rise focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rise 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 acrete, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the subsequently accompanied by laboratory e	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can experience and individually. Z/X	2 engthening shear, and 2 engonents of this of high ience the 4 30 ts. A study 5 f structures, e resistance I structures, e resistance I structures, e remains a fine of the structures of the structure of the str
The course is focus 133YPRK The course focuse existing concrete 133YRZM The course 133YVHB The aim of the course high performance cors 134DISE 134DPM Design of steel / times focus 134O02D Deepening of known buckling of structure of steel and compo 134YDKM Timber structures for 134YHNK Subject YHNK cover and practice in designed.	design methods, material properties of concrete and steel reinforcement at high temperatures, fire design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of Concrete Structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of bein foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese 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 increte, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the subsequently accompanied	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can experient and individually. Z/X	2 engthening shear, and 2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5 f structures, e resistance I structures, e resistance I structures, e resistance I structures, e steels
The course is focus 133YPRK The course focuse existing concrete 133YRZM The course focuse existing concrete 133YVHB The aim of the course formance corsection for the course formance corsection focus fo	design methods, material properties of concrete and steel reinforcement at high temperatures, fire design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of ben foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese 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 to reter, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the subscription and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the subscription and the method of manufacturing and project of master study. Diploma Seminar Semestral project of master study. Diploma Thesis 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 superise Steel Structures 2D Indege received from courses 133NNK and 134OK01. Amplifying of theoretical knowledge in the field of steel grade selection, toughness all systems, joint classification, and high strength steel and demanding composite steel and concrete structures. Complementation of site structures and detailed design of industrial buildings and crane girders. Design of masts, towers, chimneys, t	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can experient and individually. Z/Z X s, global analysis of knowledge from firdines, technological ares. Z faluminium alloys: ed structures. Stainspect to low-carbor inspect to low-carbor	2 engthening shear, and 2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5 f structures, e resistance I structures, e res
The course is focus 133YPRK The course focuse existing concrete 133YRZM The course focuse existing concrete 133YVHB The aim of the course formance cors 134DISE 134DPM Design of steel / transport focus 134O02D Deepening of known buckling of structure of steel and compo 134YDKM Timber structures for focus for the focus	design methods, material properties of concrete and steel reinforcement at high temperatures, fire design rules, thermal and design methods, material properties of concrete and steel reinforcement at high temperatures, fire design of masonry structures are also discussed. Surface repairs, strengthening of Concrete Structures are also discussed. Surface repairs, strengthening of contactors, strengthening of structural elements to the effects of bein foundation structures are discussed. The course appropriately combines theoretical approaches with common practice. Reconstruction and strengthening of bridges rese focuses on the assessment of existing concrete and masonry bridges, determination of carrying capacity, design of rehabilitation Ultrahigh Performance Concretes rese 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 increte, the composition and the method of manufacturing, which are subsequently accompanied by laboratory exercises, where the subsequently accompanied	Z alysis, loads, designes. Z res. Methods of streding moment and strengthening Z and strengthening Z structures. The cored to the componer students can experient and structural elements or individually. Z Z X S, global analysis of knowledge from firdines, technological ares. Z and in fire. Z f aluminium alloys: ed structures. Stainspect to low-carbor	2 engthening shear, and 2 engthening shear, and 2 engonents of hits of high ience the 4 30 ts. A study 5 f structures, e resistance I structures, e res

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 benaviour of m	nain individual elements and their design. Historic structures and their reconstruction. Designing typical structural details based on ca also using modern methods of joining elements of timber structures.	rpentry joints, we	will discuss
134YNSK	Design of Glass Structures	Z,ZK	2
	ended for students of the master's program Civil Engineering, deepens the knowledge acquired in the subject 134YNKS. Extension of		
	plass beams, columns and walls. Principles of designing structural elements made of glass according to normative documents, exper		- 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	elements.	
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	rengthening, strengthening of steel and timber structures and strengthening of connections. Using of computers in reconstructions ar models.	id development of	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	_	1
	f steel structures are analysed including the importance of imperfections for a design of thin plated structures. Presented are principl		- 1
•	cory of buckling of thin plates. The results are applied to the 4th class cross sections in harmony with Eurocode. Buckling due to norm	=	-
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	d on member
and structure stab	ility. Possible global analysis methods are presented together with methods for compression and bending interaction for slender mem	bers. In detail, sp	ecific cases
	of lateral torsional buckling are explained including also tapered members.		
134YSOD	Connections of steel and timber structures	Z	2
4041/001/	The subject allows insight and ability to apply the knowledge related to structural connections and its application by softwar	e. 	
134YSOK	Special steel structures structures - actions, design, detailing. Silos - actions, behaviour, silos with rigid and non-rigid section. Masts - division, detiling, design	_	2
Crane supporting	calculation.	n. Cable 100is - p	rocedure or
135DISE	Diploma Seminar	Z	4
	ledge in the field according to the choice of the assignment as preparation for the Diploma Thesis, study of specialized literature and kno		1 1
3.	preparation of theoretical research and variant solutions , or preparation for the implementation of an experimental program		,
135DPM	Diploma Thesis	Z	30
In the diploma thes	sis, the student deals with a topic chosen by the department from those regularly announced by the department. It addresses, for example 1.	mple, problems re	elated to the
design and constru	ction of geotechnical structures, civil engineering structures, special foundations for industrial, transport, housing and water managen	ant structures of	
J			arth and rock
	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis projection.	ct.	
135DYGK	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis projection. Dynamics of geotechnical structures	z,ZK	4
135DYGK The course build	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis proje Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the det	Z,ZK ermination of the	4 loading of
135DYGK The course build geotechnical structure.	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis projection by namics of geotechnical structures So on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the	Z,ZK ermination of the	4 loading of letermining
135DYGK The course build geotechnical structure.	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis proje Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the det	Z,ZK ermination of the	4 loading of letermining
135DYGK The course build geotechnical structure.	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis projection by namics of geotechnical structures. So on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected to the contract of the properties of technical seismicity and earthquakes on selected to the contract of the properties of technical seismicity and earthquakes on selected to the contract of the properties of technical seismicity and earthquakes on selected to the contract of the properties of technical seismicity and the contract of the properties of the properties of technical seismicity and the contract of the properties of the properti	Z,ZK ermination of the	4 loading of letermining
135DYGK The course build geotechnical struthese properties.	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels).	Z,ZK ermination of the procedures for digeotechnical structures Z,ZK	4 loading of letermining ctures (slab
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics	Z,ZK ermination of the procedures for digeotechnical structures Z,ZK	4 loading of letermining ctures (slab
135DYGK The course build geotechnical struthese properties.	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures.	Z,ZK ermination of the procedures for digeotechnical structures Z,ZK	4 loading of letermining ctures (slab
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structure of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance.	z,ZK ermination of the procedures for dependent structures and the use	4 loading of letermining ctures (slab 5 e of methods
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structure of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance.	z,ZK ermination of the procedures for dependent structures and the use Z. Relation between	4 loading of letermining ctures (slab 5 e of methods 2 n application
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structure of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling	z,ZK ermination of the procedures for degeotechnical structures and the use Z. Relation betwee Z	4 loading of letermining ctures (slab 5 e of methods 2 n application 2
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acqua	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structure of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction in the structure of the properties of the properties of the design in Geotechnics. Emphasis is placed on introduction of the properties of the properties of the design of the properties of the	z,ZK ermination of the procedures for dependent of the procedure of the procedur	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element N	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structure of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling and geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite	z,ZK ermination of the procedures for dependential structures and the use Z Relation betwee Z Dducing the basic elements used in	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element N	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structure of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction in the structure of the properties of the properties of the design in Geotechnics. Emphasis is placed on introduction of the properties of the properties of the design of the properties of the	z,ZK ermination of the procedures for dependential structures and the use Z Relation betwee Z Dducing the basic elements used in	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, materia	Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the det ctures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structure of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling ainted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introdethod and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems.	z,ZK ermination of the procedures for dependential structures and the use Z Relation betwee Z Dducing the basic elements used in	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, materia	Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the det ctures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the landdition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structure of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling ainted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introdethod and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite ial models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The	z,ZK ermination of the exprocedures for degeotechnical structures and the used z. Relation betwee z. Relation betwee z. Relation betwee z. Z. Selements used in its knowledge is fuzziero.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical inther applied 2
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquethe Finite Element Napplications, material	Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the landition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling ainted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite ial models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures	z,ZK ermination of the exprocedures for degeotechnical structures and the used. Z,ZK etures and the used. Z anducing the basic elements used in its knowledge is further the second to the control of t	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical orther applied 2 wledge in the
135DYGK The course build geotechnical structhese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquethe Finite Element Napplications, material	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling ainted with the Finite Element Method, the currently dominant tool for numerical modelling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite ial models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures attitudes of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course	z,ZK ermination of the exprocedures for degeotechnical structures and the use z,ZK etures and the use z z. Relation betwee z z ducing the basic elements used in its knowledge is fur z deepens the knowle application of the Prague.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical inther applied 2 wledge in the e knowledge
135DYGK The course build geotechnical struct these properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the landdition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics Specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling ainted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures Minuation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course of construction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in	z,ZK ermination of the exprocedures for degeotechnical structures and the use z,ZK etures and the use z z. Relation betwee z z ducing the basic elements used in its knowledge is fur z deepens the knowle application of the Prague.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical rither applied 2 wledge in the e knowledge
135DYGK The course build geotechnical struct these properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling ainted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introducted and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures thinuation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course of construction and provides practical experience in the design and implementation of underground struc	z,ZK ermination of the exprocedures for degeotechnical structures and the use z,ZK etures and the use z z. Relation betwee z z ducing the basic elements used in its knowledge is fur z deepens the knowle application of the Prague.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical rither applied 2 wledge in the e knowledge
135DYGK The course build geotechnical struct these properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, materion applications, materion applications of the course is a confield of underground the Fundamentals	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures Is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling inted with the Finite Element Method, the currently dominant tool for numerical modelling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures Mechanics of underground structures deconstruction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in Basics of mining of Quarrying course introduces students to all the essential aspects of aggregate mining, an important part of the national economy, in way. Aggregates ext	z,ZK ermination of the procedures for dependential structures and the use z,ZK etures and the use z,ZK etures and the use z,ZK etures and the use z,Z . Relation betwee z z educing the basic elements used in its knowledge is fur z deepens the knowle application of the prague. Z a concise and und	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical orther applied 2 wledge in the e knowledge 2 derstandable
135DYGK The course build geotechnical struct these properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material	Sericitic issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling directed in the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introduction the finited with the Finite Element Method, the currently dominant tool for numerical Engineering. The course suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The modeling of fundation to selected problems of walks, which is part of the Bachelor's degree programme. The course dominant provides practical experience in the design and implementation of underground construction in way. Aggregates extracted and processed in various ways are essential raw materials for most construction industries. Soil structures	z,ZK ermination of the exprocedures for degeotechnical structures and the use z,ZK etures and the use z z. Relation betwee z z ducing the basic elements used in its knowledge is fur z deepens the knowle application of the Prague.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical rither applied 2 wledge in the e knowledge
135DYGK The course build geotechnical struthese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material 135YMPK The course is a confield of underground 135YZAL The Fundamentals	Sericitic issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Mith the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introduction the finite diacrostruction and provides practical experience in the design and implementation of underground structures. The student will perform most construction in duartor of underground structures. The student will get acquainted with the design and more of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures thinuation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course donstruction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in way. Aggregates extracted and processed in various ways are essential raw materials for most construction industries. Soil structures Principles of soil structures design	z,ZK ermination of the exprocedures for dependent of the exprocedures for dependent of the expression	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical arther applied 2 wledge in the e knowledge 2 derstandable
135DYGK The course build geotechnical struthese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material structory application of the course is a confield of underground 135YZAL The Fundamentals 135YZKS 136DISE	structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures so not the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the line addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basis methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures tinuation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course donstruction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in way. Aggregates extracted and processed in various ways are essential raw materials for most construction industries. Soil structures Principles of soil structures design	z,ZK ermination of the procedures for dependential structures and the use z,ZK etures and the use z,ZK etures and the use z,ZK etures and the use z,Z declaring the basic elements used in its knowledge is fury z, Z deepens the knowle application of the prague.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical arther applied 2 wledge in the e knowledge 2 derstandable 2 4
135DYGK The course build geotechnical struthese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material 135YMPK The course is a corfield of underground 135YZAL The Fundamentals 135YZKS 136DISE	Sericitic issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Mith the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introduction the finite diacrostruction and provides practical experience in the design and implementation of underground structures. The student will perform most construction in duartor of underground structures. The student will get acquainted with the design and more of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures thinuation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course donstruction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in way. Aggregates extracted and processed in various ways are essential raw materials for most construction industries. Soil structures Principles of soil structures design	z,ZK ermination of the procedures for dependential structures and the use z,ZK etures and the use z,ZK etures and the use z,ZK etures and the use z,Z declaring the basic elements used in its knowledge is fury z, Z deepens the knowle application of the prague.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical arther applied 2 wledge in the e knowledge 2 derstandable 2 4
135DYGK The course build geotechnical struthese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material 135YMPK The course is a corfield of underground 135YZAL The Fundamentals 135YZKS 136DISE	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis project Dynamics of geotechnical structures so not the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the International to the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures Mechanics of underground structures deconstruction and provides practical experience in the design and implementation of underground structures. The course of construction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in way. Aggregates extracted and processed in various ways are essential raw materials for most construction industries. Soil structures Principles of soil structur	z,ZK ermination of the procedures for dependential structures and the use z,ZK etures and the use z,ZK etures and the use z,ZK etures and the use z,Z declaring the basic elements used in its knowledge is fury z, Z deepens the knowle application of the prague.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical arther applied 2 wledge in the e knowledge 2 derstandable 2 4
135DYGK The course build geotechnical struthese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material applications, material applications of the Fundamentals 135YZAL The Fundamentals 135YZKS 136DISE Preparation of the Element Napplication of the Elementals	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis projection of geotechnical structures so on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the det ctures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the lin addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling inted with the Finite Element Method, the currently dominant tool for numerical modeling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures Mechanics of underground structures thought of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course of construction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in way. Aggregates extracted and processed in various way	z,ZK ermination of the procedures for dependential structures and the use z,ZK etures and the use z,ZK etures and the use z,ZK etures and the use z,Z educing the basic elements used in its knowledge is furnish knowledge is furnish z, z, a concise and une z,	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical inther applied 2 wledge in the e knowledge 2 derstandable 2 //, information
135DYGK The course build geotechnical struthese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material applications, material applications of the Fundamentals 135YZAL The Fundamentals 135YZKS 136DISE Preparation of the Element Napplication of the Element Napplications of the Element Napplication of the E	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis projection Dynamics of geotechnical structures so not the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures Initiation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course of construction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in Basics of mining of Quarrying course introduces students to all the essential aspects of aggregate mining, an important part of the national economy, in way. Aggregates extracted and processed in var	z,ZK ermination of the procedures for dependential structures and the use z,ZK etures and the use z,ZK etures and the use z,ZK etures and the use z,Z educing the basic elements used in its knowledge is furner z, z,z deepens the knowle application of the prague. Z etuction technology z,	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical arther applied 2 wledge in the e knowledge 2 derstandable 2 derstandable 30 es, laboratory struction or
135DYGK The course build geotechnical struthese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material applications, material applications of the Fundamentals 135YZAL The Fundamentals 135YZKS 136DISE Preparation of the Element Napplication of the Element Napplications of the Element Napplications of the Element Napplication of the	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis proje Dynamics of geotechnical structures is on the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the in addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and strue of their static assessment. Geotechnical monitoring ures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction and their subsequent application to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures Mechanics of underground structures thinuation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course of construction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in way. Aggregates extracted and processed in various ways are essential raw materials	z,ZK ermination of the procedures for dependential structures and the use z,ZK etures and the use z,ZK etures and the use z,ZK etures and the use z,ZC educing the basic elements used in its knowledge is furnished to the prague. Z deepens the knowle application of the prague. Z a concise and und z z etuction technology z s of road structure ign of a new construction or reconstruction or reconstruction.	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical arther applied 2 wledge in the e knowledge 2 derstandable 2 derstandable 30 es, laboratory struction or ruction of
135DYGK The course build geotechnical struthese properties. 135GET Familiarization with 135YGEM Monitoring of struct 135YGSM Students get acquathe Finite Element Napplications, material applications, mat	Structures in complex cases and waste disposal structures. The thesis builds on and develops the findings of the thesis projection Dynamics of geotechnical structures so not the knowledge acquired by students of the Dynamics of Building Structures course. The student will get acquainted with the detectures from natural and technical seismicity, will get an overview of the properties of dynamically loaded soils and rocks, including the land addition, the student will learn the basic procedures for assessing the effects of technical seismicity and earthquakes on selected foundations, frame and retaining walls, embankments, slopes, tunnels). Geotechnics specific issues of building foundation, mastering the basic methods of technology of implementation of individual elements and structures and subsoil as a tool for confirmation of assumptions made at the design stage, selection of input data and reliability assurance of sensors and gathered data for back analyses and modelling of field performance. Geotechnical Software for Numerical modelling in Geotechnics. Emphasis is placed on introduction to selected problems of Geotechnical Engineering. The course summarises the types of finite all models suitable for the description of soil deformation, and selected specifics associated with numerical modeling in geotechnics. The in the modeling of foundation, embedded walls, and stability problems. Mechanics of underground structures Initiation of the course Underground structures and rock mechanics, which is part of the Bachelor's degree programme. The course of construction and provides practical experience in the design and implementation of underground structures. The student tries out the gained on a simple tunnel project. An integral part of the course is also an excursion to a completed underground construction in Basics of mining of Quarrying course introduces students to all the essential aspects of aggregate mining, an important part of the national economy, in way. Aggregates extracted and processed in var	z,ZK ermination of the procedures for dependential structures and the use z,ZK etures and the use z,ZC educing the basic elements used in its knowledge is furnities knowledge is furnities z, ZC etures and unce z, ZC etures and unce z, ZC etures and unce z, ZC etures are great a reconstruction or reconstruction or reconstruction or reconstruction or reconstruction are, for example,	4 loading of letermining ctures (slab 5 e of methods 2 n application 2 principles of geotechnical arther applied 2 wledge in the e knowledge 2 derstandable 2 derstandable 30 es, laboratory struction or ruction of comparison

136S03D Road construction 3D	Z,ZK	5
Introduction to urban engineering, solutions in built-up areas - reconstruction. Parking - solution methods, technical parameters and re		
Public mass transport and its preferences. Pedestrian and bicycle traffic. Traffic signs. Adaptations for the blind and partially		
136S04D Road construction 4D	Z,ZK	4
Course 13604D is the final professional course for students who have chosen to specialization in road construction. The course deeper	• • • • •	
of technologies and technical solutions of road structures including pavements and extends it to other special or otherwise specific technologies for asphalt pavements, concrete pavements, stone paved pavements and bridge	•	cea to key
136YEES Environmental Aspects and Esthetics of Road Structures	Z Z	2
Terminology of evironmental terms, Laws 114/1991 and 100/2000, Detailed description of the EIA process from the point of view of t	=	
principles of acoustics, noise from traffic and anti-noise measures, emissions and immissions from traffic, historical development of		
relationship between increasing traffic intensity and decreasing emissions from better-quality vehicles, animal migration and its rea		
maintenance according to categories and owners, functioning of municipal and city authorities, competence of mayors, councils, cou	ncils and officials of the Department of	Transport
and Construction, advantages and risks transition to electric cars, technical, economic and environmental aspects and risks, issues		
construction in the Czech Republic, basics of automobile traffic modeling, aesthetics of off-road road design, landscape profile cons	· ·	
height profile, most common mistakes in proposals, risks of ill-advised acceptance of data from CRMV for transport ex numbers, the of the vehicle fleet, the differences between static and dynamic composition in the dat		mposition
136YLET Airports	Z	2
Types of airports, organization, data about airports, legislature, choice notions, movement of aeroplanes, flight and touch - down, asset	_	geometric
characteristics , ACN / PCN, protective zone, visual aids, traffic processes at the airport, structureof terminals a		
136YMVZ Pavement mechanics	Z	2
Rise and development of road pavement mechanics, fundamental data for designing, characteristics of traffic load, thermic and wa subgrade, road pavement materials, pavement design methods - partition, development and possibilities. Stress and transformatic		- 1
subgrade, road pavement materials, pavement design methods - partition, development and possibilities. Sitess and transformation subgrade, pavement design specificity for different constructional types, road pavements with specific types.		on and
136YPPK Intersection Highway Design	KZ	2
Design of interchange. Based on capacity assessment, evaluation of the most suitable form of interchange and its desi		-
137DISE Diploma Seminar	Z	4
After agreement with the teacher, a preliminary thesis topic is determined. The student should responsibly prepare for the creation of the	ne work itself by studying the documents	s, creating
research, and obtaining background materials (e.g. maps). Furthermore, he should determine the outline of the work and master	the work with any measuring technique	e, etc.
137DPM Diploma Thesis	Z	30
The diploma thesis is the final complex work prepared by students at the end of their university studies. The diploma thesis describes	_	
student demonstrates the ability to work independently and an engineering approach. The diploma thesis takes the form of either a pr study of new railway lines), a research (processing of an overview in a certain area) or a laboratory (including the execution and evalu	•	
one.	ation of specified laboratory tests), or a	COMBINE
137YAZS Project - Progressive application of substructure	KZ	2
The content of the subject is focused on the presentation of the latest knowledge and results of research and development in the fire	ı	ı
entered into common practice or the regulatory base in the Czech Republic. It complements and expands students' knowledge	ge from basic subjects Z01, Z02 and Z0	3.
137YDKP Diagnostics of rail transport construction	Z	2
Diagnostics of the railway track - Czech regulation 177/1995 as amended, regulations for assessing the operability of the lines, mean	-	cture and
switches, railway substructure - ballast bed. Measurement of other track parameters. Examples of defects and sho		
137YEAD Ecological Aspects of Transport		2
Negative impacts of noise and vibration on human. Assessment of varied transport noise Acoustic levels. Noise maps. Noise study. means. Propagation of noise. Ways of environment protection before adverse impacts of transport noise (urban, archite		ransport
137Z02D Railway structures 2D	Z,ZK	5
Track design of individual types of railway stations, structural elements of railway stations, equipment for passenger and freight transp		
modernisation and optimisation of railway lines, design of tram and metro lines, ecological impacts	-	,,
137Z03D Railway Structures 3D	Z,ZK	4
The subject is aimed at a detailed introduction to the construction and maintenance of railway lines. Students are introduced to work	ing procedures and mechanization tools	s that are
used for the construction of the railway bottom and top and for the establishment and maintenance of the geom		
210DISE Diploma Seminar	Z	4
Preparatory works on diploma thesis elaboration. Literature review, study on problematics to be solved - practical cases in geotechnical	I laboratory and the Josef underground I	laboratory
(http://ceg.fsv.cvut.cz).		
210DPM Diploma Thesis Students will get the experturity to experimental work from the beginning of production, experimental in	Z	30
Students will get the opportunity to organize complex process of experimental work from the beginning of production, experimental in fit scientific and research activity of the Experimental Centre	ivestigation to or the data. Thesis are de	saigi ieu lu
220DISE Diploma Seminar	Z	4
Preparatory works on diploma thesis elaboration. Literature review, study on problematics to be solved - practical cases in geotechnical	-	
(https://www.stolajosef.cz).	, a 2 a a a a a a a a a a a a a a a a a	,
220DPM Diploma Thesis	Z	30
Diploma thesis elaboration with possible use of geotechnical laboratory and underground facility the Josef underground	d laboratory (http://ceg.fsv.cvut.cz).	
220YLPG Geotechnical laboratory	Z	2
A course dealing with practical exercise on geotechnical tests in laboratory and in-situ activities (The losef underground laboratory	http://cog fev.cvut.cz/ It focuses on lak	orotoni

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2025-11-04, time 08:36.

determination of soil and rock parametres neccessary for geotechnical calculations and design - basic physical and hydrophysical properties, strength and deformation parametres.