Study plan

Name of study plan: Geodézie a kartografie

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Geodesy and Cartography Type of study: Bachelor full-time Required credits: 180 Elective courses credits: 0 Sum of credits in the plan: 180 Note on the plan: p echod na nový studijní plán, plat pro nástup 2021 a 2022

Name of the block: Compulsory courses Minimal number of credits of the block: 165 The role of the block: Z

Code of the group: BG20190100 Name of the group: Geodézie a kartografie, 1. semestr Requirement credits in the group: In this group you have to gain at least 29 credits Requirement courses in the group: In this group you have to complete at least 6 courses Credits in the group: 29 Note on the group:

Note on the group	5.					
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
101KOGG	Constructive Geometry Hana Lakomá, Petra Vacková, Jozef Bobok, Iva Malechová, Iva Slámová Hana Lakomá Hana Lakomá (Gar.)	Z,ZK	5	2P+2C	Z	Z
101MM1G	Mathematics 1G Jozef Bobok, Iva Malechová, Jan Chleboun, Milan Bo ík Jan Chleboun Ivana Pultarová (Gar.)	Z,ZK	5	2P+2C	z	Z
102FY_1	Physics 1G Ji í Novák Ji í Novák Ji í Novák (Gar.)	Z,ZK	5	2P+2C	Z	Z
154GED1	Geodesy 1 Rudolf Urban Jaroslav Braun Rudolf Urban (Gar.)	Z,ZK	5	2P+3C	Z	Z
155GEP1	Geodetic instruments 1 Zden k Vysko il Zden k Vysko il (Gar.)	Z,ZK	5	2P+2C	Z	Z
155IGS1	Interactive Graphical Systems 1 Petr Soukup Petr Soukup (Gar.)	KZ	4	1P+2C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=BG20190100 Name=Geodézie a kartografie, 1. semestr

			r				
101KOGG	Constructive Geometry	Z,ZK	5				
In the first part the course contains the basics and principles of projections of the space. It applies and practices this knowledge when displaying solids, surfaces, geodetic curves, the							
reference sphere with n	neridians and parallels, when using cartographic projections and in the constructive photogrammetry. The 3D program Sketch	Up is used for vis	sualization and				
solving geometric probl	ems. In the second part, the course presents the basics of spherical trigonometry and its use in mathematical geography and	l astronomy.					
101MM1G	Mathematics 1G	Z,ZK	5				
https://mat.fsv.cvut.cz/v	yuka/bakalari/zs/MA1G/						
102FY_1	Physics 1G	Z,ZK	5				
This course focuses on	basic physical phenomena and applications of classical mechanics, thermodynamics and thermal properties of materials, ele	ectricity and magn	etism. Individual				
topics arecomplemente	d by technical applications with a special focus on surveying and measurement methods.						
154GED1	Geodesy 1	Z,ZK	5				
Historical development	of geodesy, representation of the Earth and reduction of measured quantities. Basic geodetic instruments (theodolites, distar	ice meters) and a	ids and their				
parts. Instrument errors	and their elimination. Theoretical basics of measuring horizontal and vertical angles and lengths. Centering of measured qua	antities. Point field	ls, geodetic				
reference systems in th	e Czech Republic. Basic coordinate calculations. Introduction to Error Theory and Balancing Calculus.						
155GEP1	Geodetic instruments 1	Z,ZK	5				
The subject aims at the	principles of optical devices and their functional parts. Simple optical tasks lead to an understanding of the principles of optical	al measurement.					
155IGS1	Interactive Graphical Systems 1	KZ	4				
The subject of practical training is the Kokeš system - an interactive graphic editor for working with digital maps. The exercises consist of solving practical tasks in a number of areas							
of the system's use. Lectures are focused on an introduction to algorithmization of (geodetic) tasks. Flow charts are used to write the algorithms. The functionality of the algorithms is							
demonstrated using Matlab. A web-based course in the Moodle system is used for teaching.							

Code of the group: BG20190200 Name of the group: Geodézie a kartografie, 2. semestr Requirement credits in the group: In this group you have to gain at least 28 credits Requirement courses in the group: In this group you have to complete at least 7 courses Credits in the group: 28

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
101MM2G	Mathematics 2G Jozef Bobok, Iva Malechová, Jan Chleboun, Milan Bo ík Jan Chleboun Jan Chleboun (Gar.)	Z,ZK	5	2P+2C	L	Z
102FY_2	Physics 2G Ji í Novák, Pavel Novák Ji í Novák Ji í Novák (Gar.)	Z,ZK	5	2P+2C	L	Z
154GED2	Geodesy 2 Rudolf Urban, Martin Štroner Jaroslav Braun Martin Štroner (Gar.)	Z,ZK	5	2P+3C	L	Z
154VY1	Fieldwork Training of Geodesy 1,2 Michal Seidl Michal Seidl (Gar.)	KZ	2	4C	L	Z
155GEP2	Geodetic instruments 2 Zden k Vysko il Zden k Vysko il (Gar.)	Z,ZK	5	2P+2C	L	Z
155GIT1	Informatics 1 Jan Holešovský, Martin Landa, Jaroslav Šedina Martin Landa Aleš epek (Gar.)	КZ	5	2P+2C		Z
155VGP	Fieldwork training in geodetic instruments Zden k Vysko il Zden k Vysko il Zden k Vysko il (Gar.)	KZ	1	2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=BG20190200 Name=Geodézie a kartografie, 2. semestr

101MM2G	Mathematics 2G	Z,ZK	5
Core course focuse	d on integral calculus of functions of one variable, differential calculus of functions of several variables, and elements of ordina	ary differential equation	ns. This course
is taught only in Cz	ech. More information on https://mat.fsv.cvut.cz/vyuka/bakalari/ls/MA2G/		
102FY_2	Physics 2G	Z,ZK	5
The course introdu	es students to the basic concepts and applications of electromagnetic waves, optics, optical devices, laser principles, thermal ra	diation and photodete	ctors. Individual
topics are complen	ented by technical applications with a special focus on surveying and metrology.		
154GED2	Geodesy 2	Z,ZK	5
Determining height	s (height point fields, height systems, measurement methods, devices and aids for technical leveling). Geodetic position bases	, coordinate systems	and map works
on the territory of the	e Czech Republic. Methods of detailed topographic measurement and its numerical and graphical processing. Marking tasks	(circular arcs and sim	ple, objects),
determination of di	nensions. Initial information about the real estate cadastre of the Czech Republic, BIM, GNSS, Laser scanning, photogramme	try.	
154VY1	Fieldwork Training of Geodesy 1,2	KZ	2
The course provide	s practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several thematic	tasks.	
155GEP2	Geodetic instruments 2	Z,ZK	5
The subject aims a	the principles of operation of electro-optical geodetic instruments (rangefinders, theodolites, laser instruments) and other inst	truments used in land	surveying -
gyrotheodolite, GN	SS. From a practical point of view, the subject is oriented towards working with GNSS and the subsequent processing of meas	surements.	
155GIT1	Informatics 1	KZ	5
One of the three in	roductory courses in bachelor's study program into applied informatics. The course is focused on practical tasks which may be	e extended in following	g courses.
	ant is strassed together with loops, if statements and user defined functions		
Algorithm developr	ent is stressed together with loops, if-statements and user-defined functions.		
Algorithm developr 155VGP		KZ	1
155VGP	Fieldwork training in geodetic instruments subject consists of seven tasks, which are solved by students in two- to four-member teams over five days. GNSS, laser scann	1 1	1 ling - with the

Code of the group: BG20180300

Name of the group: Geodézie a kartografie, 3. semestr

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

Requirement courses in the group: In this group you have to complete at least 6 courses Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
101MA3G	Mathematics 3G Jozef Bobok, Iva Malechová, Jan Chleboun, Milan Bo ík Jan Chleboun Zden k Skalák (Gar.)	КZ	5	2P+2C	Z	Z
101PMSG	Probability and Statistics Jozef Bobok, Jana Nosková Jana Nosková (Gar.)	Z,ZK	5	2P+2C	L	Z
154GED3	Geodesy 3 Martin Štroner Martin Štroner Martin Štroner (Gar.)	Z,ZK	5	2P+3C	Z	Z

154TCV1	Theory of Errors and Adjustment Calculus 1 Martin Stroner Martin Stroner Martin Stroner (Gar.)	Z,ZK	5	2P+2C	Z	Z
155IN2G	Informatics 2 Jan Pytel Jan Pytel Jan Pytel (Gar.)	Z,ZK	5	2P+2C	Z	Z
155MAPO	Mapping Martin Tauchman Martin Tauchman Martin Tauchman (Gar.)	Z,ZK	5	2P+3C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=BG20180300 Name=Geodézie a kartografie, 3. semestr

101MA3G	Mathematics 3G	KZ	5				
https://mat.fsv.cvut.cz/vyuka/bakalari/zs/MA3G/							
101PMSG	Probability and Statistics	Z,ZK	5				
Fundamental concepts	and terminology, random variables, descriptive and inferential statistics. Discrete and continuous random variables, normal di	stribution, log- no	rmal distribution.				
Classical and nonparam	etric methods of estimation and hypotheses testing. Simple and multivariate linear regression.						
154GED3	Geodesy 3	Z,ZK	5				
Altitude system of the C	zech Republic. Methods of stabilization of altitude points. Geometric levelling from the centre, technology of precision and te	chnical levelling in	ncluding errors				
and accuracy characteri	stics. Method of trigonometric determination of height differences. Methods of suppressing the effect of refraction on the mea	sured zenith angl	e. Centering and				
mathematical reduction of	of measured quantities. Detailed altimetry measurements include older and newer technologies of the tachymetric method accord	ling to the available	e instrumentation				
up to the production of t	he altimetry plan.						
154TCV1	Theory of Errors and Adjustment Calculus 1	Z,ZK	5				
Measurement errors and	d their division, two and multidimensional errors. Measurement properties, characteristics of random variables. Probability dis	stributions. Law of	accumulation of				
real errors, standard dev	viations. Characteristics of precision. Equalization of measurements. Least squares method (equating measurements of inter	mediate, conditio	nal, intermediate				
with conditions). Alignme	ent of bound and free geodetic grids. Regression and correlation analysis - linear regression. Basics of statistical hypothesis	testing.					
155IN2G	Informatics 2	Z,ZK	5				
In the course, students	are introduced to the relational model, session normalization, integrity constraints, logical and physical database schema, co	nceptual schema	, as well as				
database model design methodology, E-R diagrams and data flow diagrams.							
155MAPO	Mapping	Z,ZK	5				
A set of lectures describing ways of renewing the cadastral documentation, the historical development of cadastral mapping in the Czech Republic and the creation of digital technical							
maps, including the issue of their updating.							

Code of the group: BG20180400

Name of the group: Geodézie a kartografie, 4. semestr

Requirement credits in the group: In this group you have to gain at least 30 credits Requirement courses in the group: In this group you have to complete at least 7 courses Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
154GED4	Geodesy 4 Zden k Sko epa Zden k Sko epa Zden k Sko epa (Gar.)	Z,ZK	5	2P+2C	L	Z
154VY3	Geodesy 4 Lenka Línková Zden k Sko epa (Gar.)	KZ	2	4C	L	Z
155IN3G	Informatics 3 Jan Pytel, Tomáš Bayer Jan Pytel Aleš epek (Gar.)	Z,ZK	5	2P+2C	L	Z
155KAR1	Cartography 1 Ji í Cajthaml Ji í Cajthaml Ji í Cajthaml (Gar.)	Z,ZK	5	2P+2C		Z
155KNEM	Cadastre of Real Estate Martin Tauchman Martin Tauchman Karel Benda (Gar.)	Z,ZK	5	2P+2C	L	Z
155VYMK	Fieldwork Training in Mapping and Cadastre Martin Tauchman Martin Tauchman Karel Benda (Gar.)	KZ	3	4C	L	Z
1551GIS	GIS 1 Martin Landa, Lena Halounová Lena Halounová Lena Halounová (Gar.)	Z,ZK	5	2P+2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=BG20180400 Name=Geodézie a kartografie, 4. semestr

154GED4	Geodesy 4	Z,ZK	5			
Attention is paid to the	problem coordinate transformation in the plane with an redundant number of identical points (Helmert transformation, congru	ent transformation	n), coordinate			
transformation in space	, to the calculation of coordinates of free station with least squares adjustment, formulation and solution of the error model of	basic intersection	n problems			
(covariance matrix of co	pordinates, mean ellipse errors, isolines for coordinate standard deviation), calculation of the traverse with least squares adju	stment and the ef	fect of errors in			
the centering of an inst	rument and the target on the measured polar coordinates.					
154VY3	Geodesy 4	KZ	2			
Surveying and calculati	on of points of the geodetic network - a flat special-purpose network with measured horizontal directions and lengths, determ	ination of trigono	metric height			
differences from simulta	aneously and bilaterally measured zenith angles and slope lengths using a total station, determination of the height of one po	int of the network	by geometric			
levelling from the centre	e (precise levelling), use of GNSS (RTK measurements in the CZEPOS network of reference stations), calculation according	to the method of I	east squares.			
Detailed positional and	height measurements (tachymetry) of the specified location in the extravilan at a scale of 1:500 and preparation of a digital t	errain model. Mea	asurement of the			
actual state of the build	ing for the planned reconstruction and preparation of documentation at a scale of 1 : 50 (plan drawing).					
155IN3G	Informatics 3	Z,ZK	5			
This introductory C++ p	rogramming course introduces students to the basic elements of the language, program structure and data types. The course	e progresses from	n elementary			
concepts such as variable declarations, constants, variable initialization, expressions, statements, functions, and pointers. Emphasis is placed on the object-oriented features of the						
language and the use of selected tools of the standard C++ library, such as vector and map containers, and their use in dynamic memory allocation, which is essential for programming						
simple geodesic tasks and solving buffer calculus problems, for example. This introductory course does not aim to exhaustively cover all features of C++ (e.g., the issue of templates						
is only hinted at), but it o	loes aim to introduce students to C++ in sufficient detail so that they can actively program and be prepared for subsequent stud	y of object-oriente	ed programming.			

155KAR1	Cartography 1	Z,ZK	5			
The importance of math	nematical cartography. Reference surfaces and coordinate systems. Cartographic distortions. Classification of cartographic re	presentations. Re	presentation of			
an ellipsoid on a sphere	e. Simple conic, cylindrical and azimuthal representations. Irregular, polyconic, polyhedral and general representations. An ov	erview of represe	ntations used in			
the Czech Republic and	worldwide. Selection, identification and evaluation of displays. Reference coordinate systems in GIS.					
155KNEM	Cadastre of Real Estate	Z,ZK	5			
A set of lectures describ	ing the complex issues of the digital real estate cadastre from a technical and legal point of view. While in the subject of mappin	g the student lear	ns to understand			
the principle of creating	a new cadastral map, in the subject of real estate cadastre the principle of updating it is explained to him. Emphasis is placed	on technical activ	ities in cadastre.			
155VYMK	Fieldwork Training in Mapping and Cadastre	KZ	3			
At the end of the 2nd ye	ear, the teaching of the subjects of mapping and real estate cadastre is appropriately rounded off with field activities. Theoreti	ical knowledge is	applied in the			
creation of a cadastral r	nap, from the construction of a point field to the detailed measurement of the topography. Students learn the possibilities of n	neasuring in cada	stre and finding			
often complex solutions	, how to deal with the basic technical tasks of the cadastre, whether it is geometric plan or the marking of a boundary in the	terrain.				
1551GIS	GIS 1	Z,ZK	5			
GIS 1 is a set of lecture's describing basic terms, principles, models and tools how to use geographic information systems for various applications and purposes. Vector and raster data						
applications are explained.						
<u> </u>						

Code of the group: BG20180500

Name of the group: Geodézie a kartografie, 5. semestr

Requirement credits in the group: In this group you have to gain at least 30 credits Requirement courses in the group: In this group you have to complete at least 6 courses Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
155FTG1	Photogrammetry 1 Karel Pavelka, Jan Pacina Karel Pavelka Karel Pavelka (Gar.)	Z,ZK	5	2P+2C	Z	Z
155KAT2	Cartography 2 Ji í Cajthaml, Tomáš Janata Ji í Cajthaml Tomáš Janata (Gar.)	Z,ZK	5	2P+2C	Z	Z
155PJIN	Project - Informatics Martin Landa, Jaroslav Šedina, Ond ej Pešek Martin Landa Martin Landa (Gar.)	КZ	5	3C	Z	Z
155PUG	Land Consolidation Josef Vlasák Josef Vlasák (Gar.)	КZ	5	2P+2C	L	Z
155TGD1	Theoretical geodesy 1 Jakub Kostelecký Jakub Kostelecký Jakub Kostelecký (Gar.)	Z,ZK	5	2P+2C	Z	Z
1552GIS	GIS 2 Martin Landa, Lena Halounová Lena Halounová (Gar.)	Z,ZK	5	2P+2C	L	Z

Characteristics of the courses of this group of Study Plan: Code=BG20180500 Name=Geodézie a kartografie, 5. semestr

155FTG1	Photogrammetry 1	Z,ZK	5				
Introduction to photogrammetry. Analogue, analytic and digital solutions in photogrammetry. Internal and external orientation of photos, elements of orientation. Single image terrestrial							
photogrammetry, intersection and stereophotogrammetry. Survey metric cameras, methods of interpreting of photos, aerial photogrammetry, aerial and terrestrial laer scanning- an							
overview.							
155KAT2	Cartography 2	Z,ZK	5				
The course builds on the	e basics of mathematical cartography and introduces students to the topographic and thematic parts of cartography. It also incl	udes an excursion	into polygraphic				
techniques, theory of co	plour, copyright and editorial work. As a part of the course, an excursion to the offices of COSMC is organized.						
155PJIN	Project - Informatics	KZ	5				
The course follows up t	hree preceding courses in applied informatics. Students work in groups on selected project.						
155PUG	Land Consolidation	KZ	5				
The course provides the	e basic theoretical and practical background in land consolidation in the Czech Republic and includes the synthesis of sub-iss	sues in a planning	documents. The				
students create a simpl	e land consolidation project within the course in the selected area including designing of new features in common measures	plan.					
155TGD1	Theoretical geodesy 1	Z,ZK	5				
Theoretical geodesy 1 i	ntroduces the issue of creating positional, height and gravity geodetic foundations, definition and implementation of geodetic r	eference systems	- worldwide and				
for the Czech Republic. It provides information about their origin and development, including the necessary theoretical basis of higher geodesy.							
1552GIS	GIS 2	Z,ZK	5				
GIS 2 is focused on a wide range of advanced analyses in the raster GIS using map algebra, on interpolation and extrapolation in 2D and 3D, on statistical data description, geostatistics							
and graph theory for op	and graph theory for optimisation tasks of network analysis.						

Code of the group: BG20230600 Name of the group: Geodézie a kartografie, 6. 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:

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Martin Stroner Martin Stroner (Gar.) Lick O In tool L L 155GPL1 Survey Sketches 1 JI Capithami, Zaton is Violenta JI Capithami, Ji Capithami (Gar.) KZ 3 2C L z 155GPL2 Theoretical geodesy 2 Jakub Kostelecky Jakub Kostelecky LeoS Mervart (Gar.) Z,ZK 5 2P+2C L z 155GR02 Theoretical geodesy 2 Jakub Kostelecky Jakub Kostelecky LeoS Mervart (Gar.) Z,ZK 5 2P+2C L z 154INGE Engineering Surveying Engineering Surveying Planning for measurement accuracy. Measuring and setting out lengths, angles and verticals and evaluating their accurs Pasitona, height and spatial marking networks, positional and height marking. Solving and setting out arcs. Measurement and evaluation of displacements and deformations of buildin Application of geodesy in construction. Z,ZK 5 154TCV2 Theory of Errors and Adjustment Calculus 2 Z,ZK 5 164TCV2 Theory of Errors and Adjustment Calculus 2 Z,ZK 5 156GPL1 Survey Sketches 1 Z,ZK	154INGE	Engineering Surveying Jaroslav Braun Jaroslav Braun Martin Štroner (Gar.)	Z,ZK	5	2P+2C	L	Z
If if Capitant, Zeen is Valenta if if Capithant, if Cap	154TCV2	Theory of Errors and Adjustment Calculus 2	Z,ZK	5	2P+2C	L	Z
Database Jakub Kostelecký Jakub Kostelecký Leoš Mervart (Gar.) Link D <thd< th=""> D D <thd< th=""> <thd< td=""><td>155GPL1</td><td></td><td>KZ</td><td>3</td><td>2C</td><td>L</td><td>Z</td></thd<></thd<></thd<>	155GPL1		KZ	3	2C	L	Z
154INGE Engineering Surveying Z,ZK 5 History, Terminology and Symbols in Engineering Surveying. Planning for measurement accuracy. Measuring and setting out lengths, angles and verticals and evaluating their accuracy. Advantage and the evaluating and verticals and evaluating their accuracy. Measuring and setting out lengths, angles and verticals and evaluating their accuracy. Solving and setting out accs. Measurement and evaluation of displacements and deformations of buildin Application of geodesy in construction. 154TCV2 Theory of Errors and Adjustment Calculus 2 Z,ZK 5 Alignment of intermediaries, repetition of measurement errors and basic procedures in alignment: Elimination of unknowns. Sequential equalization. Errors in the initial quantitie deviations. Statistical hypothesis testing 2. Reliability. Optimization of geodetic measurements. Methods for solving normal equations. Direct solution, inversion, sequential equatities statistical hypothesis testing 2. Reliability. Optimization of geodetic measurements. Methods for solving normal equations. Direct solution, inversion, sequentize 2 introduces students to the issue of Global Navigation Satellite Systems (GNSS) and their use in practice. It expands students for the issue of statelite issue of Science 3. CZK 5 Theoretical Geodes 2 introduces students to the issue of Science 3. Z,ZK 5 Teoretical Geodes 2 introduces students to the issue of Science 3. Z,ZK 5 Teoretical Geodes 2 introduces students to the issue of Science 3. Z,ZK 5 Teoretical Geodetic instruments) on the i	155TGD2		Z,ZK	5	2P+2C	L	Z
155GPL1 Survey Sketches 1 KZ 3 155TGD2 Theoretical geodesy 2 Z,ZK 5 Theoretical Geodesy 2 introduces students to the issue of Global Navigation Satellite Systems (GNSS) and their use in practice. It expands students' knowledge from the previous subject (Geodetic instruments) on the issue of satellite movement around the Earth, errors in GNSS measurements and methods of their elimination, methods of processing GNSS measurements and detailed information on current GNSS. wame of the block: Povinná t lesná výchova, sportovní kurzy Name of the block: POV Vame of the group: BTV_POV Name of the group: Povinná t lesná výchova Requirement credits in the group: Name of the group: Povinná t lesná výchova Requirement courses in the group: In this group you have to complete at least 2 courses Credits in the group: 0 Note on the group: 0 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.) Tutors, authors and guarantors (gar.) Z 0 0+2 Z PT	Positional, height and spa Application of geodesy ir 154TCV2 Alignment of intermediar Robust methods of comp Approximation of relation	atial marking networks, positional and height marking. Solving and setting out arcs. Meas in construction. Theory of Errors and Adjustment Calculus 2 ies, repetition of measurement errors and basic procedures. The law of the accumulation pensation. Finding outlying measurements. Special procedures in alignment: Elimination ships. Regression and correlation analysis. Equating line and plane. Approximation by e	urement and evaluat on of weights. Gener n of unknowns. Sequ mpirical polynomial.	ion of displa al law of acc iential equal Harmonic a	cements an	d deformations Z,ZK of standard dev ors in the initial rier transform.	of building: 5 viations. quantities. Equalizatio
155TGD2 Theoretical geodesy 2 Z,ZK 5 Theoretical Geodesy 2 Introduces students to the issue of Global Navigation Satellite Systems (GNSS) and their use in practice. It expands students' knowledge from the previous subject (Geodetic instruments) on the issue of satellite movement around the Earth, errors in GNSS measurements and methods of their elimination, methods of processing GNSs measurements and detailed information on current GNSS. 5 Name of the block: Povinná t lesná výchova, sportovní kurzy 7 7 Vinimal number of credits of the block: 0 7 7 The group: BTV_POV 7 7 Name of the group: Povinná t lesná výchova 7 7 Requirement credits in the group: 7 7 Requirement courses in the group: In this group you have to complete at least 2 courses 7 Credits in the group: 0 7 7 7 Name of the group: 7 7 7 7 Note on the group: 0 7 7 7 7 Code Name of the course / Name of the group of courses for courses the list of codes of their members) 7 0 0+2 2 7 Tutors, authors and guarantors (gar.) 7 0 0+2 2 7 7	pseudoinversion.	Survey Skatches 1				K 7	3
Theoretical Geodesy 2 introduces students to the issue of Global Navigation Satellite Systems (GNSS) and their use in practice. It expands students' knowledge from the previous subject (Geodetic instruments) on the issue of satellite movement around the Earth, errors in GNSS measurements and methods of their elimination, methods of processing GNSS measurements and detailed information on current GNSS. Name of the block: Povinná t lesná výchova, sportovní kurzy Minimal number of credits of the block: 0 The role of the block: PT Code of the group: BTV_POV Name of the group: Povinná t lesná výchova Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 2 courses Credits in the group: 0 Note on the group: Name of the group: The order of the group: 0 Note on the group: Tutors, authors and guarantors (gar.) Tutors, authors and guarantors (gar.) Tutors, authors and guarantors (gar.) Tutor Physical Education	13301 11						5
Name of the group: Povinná t lesná výchova Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 2 courses Credits in the group: 0 Note on the group: Code Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) Z 0 0+2 Z PT	1	e ,	ir use in practice. It e	expands stud	1	·	
Requirement courses in the group: In this group you have to complete at least 2 courses Credits in the group: 0 Note on the group: Code Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) TV1 Physical Education Z 0 0+2 Z PT	Theoretical Geodesy 2 ir subject (Geodetic instrum measurements and detai Name of the blo Vinimal numbe	ntroduces students to the issue of Global Navigation Satellite Systems (GNSS) and the nents) on the issue of satellite movement around the Earth, errors in GNSS measurem iled information on current GNSS. Ock: Povinná t lesná výchova, sportovní kurzy er of credits of the block: 0	•	•	dents' know	ledge from the	previous
Credits in the group: 0 Note on the group: Code Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) TV1 Physical Education Z 0 0+2 Z PT	Theoretical Geodesy 2 ir subject (Geodetic instrum measurements and detai Name of the blo Ainimal numbe The role of the Code of the gro Name of the gro	ntroduces students to the issue of Global Navigation Satellite Systems (GNSS) and the nents) on the issue of satellite movement around the Earth, errors in GNSS measurem iled information on current GNSS. Ock: Povinná t lesná výchova, sportovní kurzy er of credits of the block: 0 block: PT Dup: BTV_POV oup: Povinná t lesná výchova	•	•	dents' know	ledge from the	previous
Note on the group: Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.) Completion Credits Scope Semester Role TV1 Physical Education Z 0 0+2 Z PT	Theoretical Geodesy 2 ir subject (Geodetic instrum measurements and detai Name of the blo Ainimal numbe The role of the gro Name of the gro Requirement cl	ntroduces students to the issue of Global Navigation Satellite Systems (GNSS) and the nents) on the issue of satellite movement around the Earth, errors in GNSS measurem iled information on current GNSS. ock: Povinná t lesná výchova, sportovní kurzy er of credits of the block: 0 block: PT oup: BTV_POV oup: Povinná t lesná výchova redits in the group:	ents and methods o	f their elimin	dents' know ation, meth	ledge from the	previous
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.)CompletionCreditsScopeSemesterRoleTV1Physical EducationZ00+2ZPT	Theoretical Geodesy 2 ir subject (Geodetic instrum measurements and detain Name of the block Ainimal number The role of the grock Name of the grock Name of the grock Requirement contracts	ntroduces students to the issue of Global Navigation Satellite Systems (GNSS) and the nents) on the issue of satellite movement around the Earth, errors in GNSS measurem iled information on current GNSS. Ock: Povinná t lesná výchova, sportovní kurzy er of credits of the block: 0 block: PT oup: BTV_POV oup: Povinná t lesná výchova redits in the group: ourses in the group: In this group you have to comp	ents and methods o	f their elimin	dents' know ation, meth	ledge from the	previous
TV1 Physical Education Z 0 0+2 Z PT	Theoretical Geodesy 2 ir subject (Geodetic instrum measurements and detain Name of the block Minimal number The role of the grock Name of the grock Name of the grock Requirement con Credits in the grock Credits in the grock	ntroduces students to the issue of Global Navigation Satellite Systems (GNSS) and the nents) on the issue of satellite movement around the Earth, errors in GNSS measurem iled information on current GNSS. Ock: Povinná t lesná výchova, sportovní kurzy er of credits of the block: 0 block: PT Dup: BTV_POV oup: Povinná t lesná výchova redits in the group: ourses in the group: In this group you have to comp proup: 0	ents and methods o	f their elimin	dents' know ation, meth	ledge from the	previous
	Theoretical Geodesy 2 ir subject (Geodetic instrum measurements and detain Name of the block Minimal number The role of the groc Name of the groc Name of the groc Requirement co Credits in the g	htroduces students to the issue of Global Navigation Satellite Systems (GNSS) and the nents) on the issue of satellite movement around the Earth, errors in GNSS measurem ited information on current GNSS. Ock: Povinná t lesná výchova, sportovní kurzy er of credits of the block: 0 block: PT Dup: BTV_POV oup: Povinná t lesná výchova redits in the group: ourses in the group: In this group you have to comp proup: 0 Dup: Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members)	blete at leas	t 2 cou	rses	ledge from the ods of process	previous
	Theoretical Geodesy 2 ir subject (Geodetic instrum measurements and detai Name of the blo Minimal number The role of the gro Name of the gro Name of the gro Requirement co Requirement co Credits in the gro Note on the gro	htroduces students to the issue of Global Navigation Satellite Systems (GNSS) and the nents) on the issue of satellite movement around the Earth, errors in GNSS measurem iled information on current GNSS. ock: Povinná t lesná výchova, sportovní kurzy er of credits of the block: 0 block: PT oup: BTV_POV oup: Povinná t lesná výchova redits in the group: ourses in the group: In this group you have to comp proup: 0 oup: 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.)	Diete at leas	t 2 cou	rses	Semester	previous ing GNSS

Characteristics of the courses of this group of Study Plan: Code=BTV POV Name=Povinná t lesná výchova

onal actoriotico of			
TV1	Physical Education	Z	0
TV2	Physical Education	Z	0

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

Code of the group: BF20190101_I Name of the group: Povinn volitelný jazyk, 1. semestr Requirement credits in the group: In this group you have to gain at least 1 credit Requirement courses in the group: In this group you have to complete at least 1 course Credits in the group: 1 Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
104YCA1	English 1 Karolína Synková, Alexandra Steinerová, Elena Da eva, Jarmila Fu íková, Sandra Giormani, Hana Horká, Petra Martincová, V ra ermáková, Michaela Németh, Svatava Boboková Bartíková Sandra Giormani (Gar.)	Z	1	2C	Z,L	J
104YCN1	German 1 Svatava Boboková Bartíková Svatava Boboková Bartíková Svatava Boboková Bartíková (Gar.)	Z	1	2C	Z,L	J

Characteristics of the courses of this group of Study Plan: Code=BF20190101_I Name=Povinn voliteIný jazyk, 1. semestr

104YCA1 English 1

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

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104YCN1 German 1

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

Code of the group: BF20190202_I

Name of the group: Povinn volitelný jazyk, 2. semestr Requirement credits in the group: In this group you have to gain at least 2 credits Requirement courses in the group: In this group you have to complete at least 1 course Credits in the group: 2

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
104YC2A	English 2 Karolína Synková, Alexandra Steinerová, Elena Da eva, Jarmila Fu íková, Sandra Giormani, Hana Horká, Petra Martincová, V ra ermáková, Michaela Németh, Svatava Boboková Bartíková Sandra Giormani (Gar.)	Z,ZK	2	2C		J
104YC2N	German 2 Svatava Boboková Bartíková Sandra Giormani Svatava Boboková Bartíková (Gar.)	Z,ZK	2	2C		J

Characteristics of the courses of this group of Study Plan: Code=BF20190202 | Name=Povinn voliteIný jazyk, 2. semestr

104YC2A	English 2	Z,ZK	2
English 2 Course code	104YC2A Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit and exam The aim of the compuls	ory English cours	e is to enhance
the knowledge of lexis	and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall fc	ocus is on professi	ional language
(i.e., ESP - technical st	yle) and communicative competence within the construction industry. The course also seeks to teach students to read technic	cal literature and t	o be able to
produce essential writte	en discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a cred	it and an examina	tion. Literature:
Horká Hana, Giormani	Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 6 10)		
104YC2N	German 2	Z,ZK	2
The compulsory course	- German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction in	dustry, understand	ding professional
texts, and learning the	necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. L	iterature: A.Hanák	ová, J.Dressel:
Deutsch im Bauwesen			

Name of the block: Povinn volitelné p edm ty, doporu ení S1 Minimal number of credits of the block: 12 The role of the block: S1

Code of the group: BG20180600_1 Name of the group: Geodézie a kartografie, bakalá ská práce Requirement credits in the group: In this group you have to gain at least 12 credits Requirement courses in the group: In this group you have to complete at least 1 course Credits in the group: 12 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
154BAPG	Bachelor project Martin Štroner Martin Štroner (Gar.)	Z	12	10C	L,Z	S1
155BAPG	Bachelor Project Zden k Vysko il, Jaroslav Šedina, Jan Pytel, Ji í Cajthaml, Jind ich Hoda , Tomáš Janata Ji í Cajthaml Ji í Cajthaml (Gar.)	Z	12	10C	Z,L	S1
101BAPG	Bachelor Project Milan Bo ík, Jana Nosková Jana Nosková Jana Nosková (Gar.)	Z	12	10C	L,Z	S1
102BAPG	Bachelor Project Petr Pokorný, Václav Nežerka Ji í Novák	Z	12	10C	L,Z	S1

Characteristics of the courses of this group of Study Plan: Code=BG20180600_1 Name=Geodézie a kartografie, bakalá ská práce

154BAPG	Bachelor project	Z		12
Final thesis, prepar	red according to the assignment.	·		
155BAPG	Bachelor Project	Z		12
Processing according	ing to the work assignment			
101BAPG	Bachelor Project	Z	-	12
Please contact you	r teacher or guarantor of this subject.	'		1
102BAPG	Bachelor Project	Z		12
in accordance with	the thesis proposal			'

List of courses of this pass:

Code	Name of the course	Completion	Credits
101BAPG	Bachelor Project	Z	12
	Please contact your teacher or guarantor of this subject.	I	1
101KOGG	Constructive Geometry	Z,ZK	5
In the first part the	course contains the basics and principles of projections of the space. It applies and practices this knowledge when displaying solids,	surfaces, geodetic	curves, the
reference sphere	with meridians and parallels, when using cartographic projections and in the constructive photogrammetry. The 3D program SketchU	p is used for visual	ization and
solving	geometric problems. In the second part, the course presents the basics of spherical trigonometry and its use in mathematical geogra	phy and astronom	у.
101MA3G	Mathematics 3G	KZ	5
	https://mat.fsv.cvut.cz/vyuka/bakalari/zs/MA3G/		
101MM1G	Mathematics 1G	Z,ZK	5
	https://mat.fsv.cvut.cz/vyuka/bakalari/zs/MA1G/		1
101MM2G	Mathematics 2G	Z,ZK	5
	ed on integral calculus of functions of one variable, differential calculus of functions of several variables, and elements of ordinary dif		This course
	is taught only in Czech. More information on https://mat.fsv.cvut.cz/vyuka/bakalari/ls/MA2G/		
101PMSG	Probability and Statistics	Z,ZK	5
Fundamental conc	epts and terminology, random variables, descriptive and inferential statistics. Discrete and continuous random variables, normal distri	bution, log- normal	distribution
	Classical and nonparametric methods of estimation and hypotheses testing. Simple and multivariate linear regression.		
102BAPG	Bachelor Project	Z	12
	in accordance with the thesis proposal	1	1
102FY 1	Physics 1G	Z,ZK	5
_	is on basic physical phenomena and applications of classical mechanics, thermodynamics and thermal properties of materials, electr	1 '	n. Individual
	topics arecomplemented by technical applications with a special focus on surveying and measurement methods.		
102FY_2	Physics 2G	Z,ZK	5
_	ces students to the basic concepts and applications of electromagnetic waves, optics, optical devices, laser principles, thermal radiation	1 '	s. Individua
	topics are complemented by technical applications with a special focus on surveying and metrology.		
104YC2A	English 2	Z,ZK	2
	code: 104YC2A Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit and exam The aim of the compulsory	/ English course is	to enhance
the knowledge of	lexis and grammar within the scope of the chosen field of study and university studies in general (Academic English); the overall focu	us is on professiona	al language
(i.e., ESP - techr	nical style) and communicative competence within the construction industry. The course also seeks to teach students to read technic	al literature and to	be able to
produce essential	written discourse and to express themselves in writing on issues in their field of study. The end of course requirements are a credit a	and an examination	. Literature:
	Horká Hana, Giormani Sandra, Martincová Petra, Nivenová Renata : Professional English for Civil Engineering (Units 6 10	D)	
104YC2N	German 2	Z,ZK	2
The compulsory co	urse - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction indus	try, understanding	professiona
texts, and learning	the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Liter	rature: A.Hanáková	, J.Dressel:
	Deutsch im Bauwesen		
104YCA1	English 1	Z	1
•	ode: 104Y CA1 Scope: 0 + 2 (practical sessions) Number of credits: 1 Final assessment: credit The aim of the compulsory English court		0
	nmar within the scope of the chosen field of study and university studies in general (Academic English); the overall focus is on profes		
	d communicative competence within the construction industry. The course also seeks to teach students to read technical literature and		
written discourse a	nd to express themselves in writing on issues in their field of study. The end of course requirements are a credit. Literature: Horká Hana	a, Giormani Sandra	, Martincová
	Petra, Nivenová Renata : Professional English for Civil Engineering (Units 1 - 5)		

104YCN1	German 1	Z	1		
The compulsory co	urse - German Language for Civil Engineering is aimed at practising professional vocabulary within the scope of the construction indust	try, understanding	professional		
	the necessary presentation skills in order to present all relevant professional issues. The end-of-course requirement is a credit. Liter				
	Deutsch im Bauwesen				
154BAPG	Bachelor project	Z	12		
	Final thesis, prepared according to the assignment.	I –	. –		
154GED1	Geodesy 1	Z,ZK	5		
	pment of geodesy, representation of the Earth and reduction of measured quantities. Basic geodetic instruments (theodolites, distanc	1 · · ·	1		
-	It errors and their elimination. Theoretical basics of measuring horizontal and vertical angles and lengths. Centering of measured qua	-			
parts. Instrumen	reference systems in the Czech Republic. Basic coordinate calculations. Introduction to Error Theory and Balancing Calculu		geodelic		
1540500			F		
154GED2	Geodesy 2	Z,ZK	5		
	ts (height point fields, height systems, measurement methods, devices and aids for technical leveling). Geodetic position bases, coord		•		
-	the Czech Republic. Methods of detailed topographic measurement and its numerical and graphical processing. Marking tasks (circu	-	e, objects),		
	etermination of dimensions. Initial information about the real estate cadastre of the Czech Republic, BIM, GNSS, Laser scanning, pho	otogrammetry.	1		
154GED3	Geodesy 3	Z,ZK	5		
Altitude system of	f the Czech Republic. Methods of stabilization of altitude points. Geometric levelling from the centre, technology of precision and tech	nical levelling inclu	ding errors		
and accuracy chara	acteristics. Method of trigonometric determination of height differences. Methods of suppressing the effect of refraction on the measure	ed zenith angle. Ce	entering and		
mathematical reduc	ction of measured quantities. Detailed altimetry measurements include older and newer technologies of the tachymetric method according	to the available inst	rumentation		
	up to the production of the altimetry plan.				
154GED4	Geodesy 4	Z,ZK	5		
	to the problem coordinate transformation in the plane with an redundant number of identical points (Helmert transformation, congruer	1 · · ·	coordinate		
-	n space, to the calculation of coordinates of free station with least squares adjustment, formulation and solution of the error model of				
	c of coordinates, mean ellipse errors, isolines for coordinate standard deviation), calculation of the traverse with least squares adjustn				
,	the centering of an instrument and the target on the measured polar coordinates.				
154INGE	Engineering Surveying	Z,ZK	5		
	y and Symbols in Engineering Surveying. Planning for measurement accuracy. Measuring and setting out lengths, angles and verticals	1 '	-		
		-			
Positional, neight a	nd spatial marking networks, positional and height marking. Solving and setting out arcs. Measurement and evaluation of displacements Application of geodesy in construction.	and deformations	or buildings.		
45470144			_		
154TCV1	Theory of Errors and Adjustment Calculus 1	Z,ZK	5		
	rs and their division, two and multidimensional errors. Measurement properties, characteristics of random variables. Probability distrib				
	rd deviations. Characteristics of precision. Equalization of measurements. Least squares method (equating measurements of intermed		ntermediate		
with c	conditions). Alignment of bound and free geodetic grids. Regression and correlation analysis - linear regression. Basics of statistical h	ypothesis testing.			
154TCV2	Theory of Errors and Adjustment Calculus 2	Z,ZK	5		
Alignment of inte	ermediaries, repetition of measurement errors and basic procedures. The law of the accumulation of weights. General law of accumula	ation of standard d	eviations.		
Robust methods of	of compensation. Finding outlying measurements. Special procedures in alignment: Elimination of unknowns. Sequential equalization.	Errors in the initial	quantities.		
Approximation of re	elationships. Regression and correlation analysis. Equating line and plane. Approximation by empirical polynomial. Harmonic analysis.	Fourier transform.	Equalization		
of conditionals wi	ith unknowns. Statistical hypothesis testing 2. Reliability. Optimization of geodetic measurements. Methods for solving normal equatio	ns. Direct solution,	inversion,		
	pseudoinversion.				
	pseudoinversion.				
154VY1		KZ	2		
154VY1 The	Fieldwork Training of Geodesy 1,2	KZ thematic tasks.	2		
The	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several	thematic tasks.	ı r		
The 154VY3	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several Geodesy 4	thematic tasks.	2		
The 154VY3 Surveying and ca	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several Geodesy 4 alculation of points of the geodetic network - a flat special-purpose network with measured horizontal directions and lengths, determine	thematic tasks. KZ nation of trigonome	2 tric height		
The 154VY3 Surveying and ca differences from s	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several Geodesy 4 alculation of points of the geodetic network - a flat special-purpose network with measured horizontal directions and lengths, determin simultaneously and bilaterally measured zenith angles and slope lengths using a total station, determination of the height of one point	thematic tasks. KZ nation of trigonome t of the network by	2 tric height geometric		
The 154VY3 Surveying and ca differences from s levelling from the	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several Geodesy 4 alculation of points of the geodetic network - a flat special-purpose network with measured horizontal directions and lengths, determin simultaneously and bilaterally measured zenith angles and slope lengths using a total station, determination of the height of one point centre (precise levelling), use of GNSS (RTK measurements in the CZEPOS network of reference stations), calculation according to	thematic tasks. KZ nation of trigonome t of the network by the method of leas	2 etric height geometric st squares.		
The 154VY3 Surveying and ca differences from s levelling from the	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several Geodesy 4 alculation of points of the geodetic network - a flat special-purpose network with measured horizontal directions and lengths, determin simultaneously and bilaterally measured zenith angles and slope lengths using a total station, determination of the height of one point centre (precise levelling), use of GNSS (RTK measurements in the CZEPOS network of reference stations), calculation according to and height measurements (tachymetry) of the specified location in the extravilan at a scale of 1 : 500 and preparation of a digital terra	thematic tasks. KZ nation of trigonome t of the network by the method of leas ain model. Measure	2 etric height geometric st squares.		
The 154VY3 Surveying and ca differences from s levelling from the Detailed positional	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several Geodesy 4 alculation of points of the geodetic network - a flat special-purpose network with measured horizontal directions and lengths, determine simultaneously and bilaterally measured zenith angles and slope lengths using a total station, determination of the height of one point centre (precise levelling), use of GNSS (RTK measurements in the CZEPOS network of reference stations), calculation according to and height measurements (tachymetry) of the specified location in the extravilan at a scale of 1 : 500 and preparation of a digital terra actual state of the building for the planned reconstruction and preparation of documentation at a scale of 1 : 50 (plan drawin	thematic tasks. KZ nation of trigonome t of the network by the method of leas ain model. Measure g).	2 tric height geometric st squares. ement of the		
The 154VY3 Surveying and ca differences from s levelling from the Detailed positional 1551GIS	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several Geodesy 4 alculation of points of the geodetic network - a flat special-purpose network with measured horizontal directions and lengths, determinismultaneously and bilaterally measured zenith angles and slope lengths using a total station, determination of the height of one point centre (precise levelling), use of GNSS (RTK measurements in the CZEPOS network of reference stations), calculation according to and height measurements (tachymetry) of the specified location in the extravilan at a scale of 1 : 500 and preparation of a digital terra actual state of the building for the planned reconstruction and preparation of documentation at a scale of 1 : 50 (plan drawin GIS 1	thematic tasks. KZ hation of trigonome t of the network by the method of leas ain model. Measure g). Z,ZK	2 geometric st squares. ement of the		
The 154VY3 Surveying and ca differences from s levelling from the Detailed positional 1551GIS	Fieldwork Training of Geodesy 1,2 course provides practical experience with filed work and ability to apply knowledge from courses Geodesy 1 a Geodesy 2 in several Geodesy 4 alculation of points of the geodetic network - a flat special-purpose network with measured horizontal directions and lengths, determine simultaneously and bilaterally measured zenith angles and slope lengths using a total station, determination of the height of one point centre (precise levelling), use of GNSS (RTK measurements in the CZEPOS network of reference stations), calculation according to and height measurements (tachymetry) of the specified location in the extravilan at a scale of 1 : 500 and preparation of a digital terra actual state of the building for the planned reconstruction and preparation of documentation at a scale of 1 : 50 (plan drawin GIS 1 GIS 1	thematic tasks. KZ hation of trigonome t of the network by the method of leas ain model. Measure g). Z,ZK	2 geometric st squares. ement of the		
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155IN2G	Informatics 2	Z.ZK	5
	Judents are introduced to the relational model, session normalization, integrity constraints, logical and physical database schema, con	,	s well as
	database model design methodology, E-R diagrams and data flow diagrams.		
155IN3G	Informatics 3	Z,ZK	5
This introductory	C++ programming course introduces students to the basic elements of the language, program structure and data types. The course	progresses from el	ementary
concepts such as	variable declarations, constants, variable initialization, expressions, statements, functions, and pointers. Emphasis is placed on the o	bject-oriented feat	ures of the
language and the u	se of selected tools of the standard C++ library, such as vector and map containers, and their use in dynamic memory allocation, whic	h is essential for pr	ogramming
	sks and solving buffer calculus problems, for example. This introductory course does not aim to exhaustively cover all features of C+-		· ·
	it it does aim to introduce students to C++ in sufficient detail so that they can actively program and be prepared for subsequent study of	object-oriented pr	ogramming.
155KAR1	Cartography 1	Z,ZK	5
	mathematical cartography. Reference surfaces and coordinate systems. Cartographic distortions. Classification of cartographic repre	-	
an ellipsoid on a sp	where. Simple conic, cylindrical and azimuthal representations. Irregular, polyconic, polyhedral and general representations. An overvi		ons used in
	the Czech Republic and worldwide. Selection, identification and evaluation of displays. Reference coordinate systems in GIS		
155KAT2	Cartography 2	Z,ZK	5
The course builds o	n the basics of mathematical cartography and introduces students to the topographic and thematic parts of cartography. It also includes		polygraphic
	techniques, theory of colour, copyright and editorial work. As a part of the course, an excursion to the offices of COSMC is orga		
155KNEM	Cadastre of Real Estate	Z,ZK	5
	scribing the complex issues of the digital real estate cadastre from a technical and legal point of view. While in the subject of mapping th		
the principle of crea	ting a new cadastral map, in the subject of real estate cadastre the principle of updating it is explained to him. Emphasis is placed on t	echnical activities	
155MAPO	Mapping	Z,ZK	5
A set of lectures de	scribing ways of renewing the cadastral documentation, the historical development of cadastral mapping in the Czech Republic and t	he creation of digit	al technical
	maps, including the issue of their updating.		
155PJIN	Project - Informatics	KZ	5
	The course follows up three preceding courses in applied informatics. Students work in groups on selected project.		-
155PUG	The course follows up three preceding courses in applied informatics. Students work in groups on selected project. Land Consolidation	KZ	5
155PUG The course provide	The course follows up three preceding courses in applied informatics. Students work in groups on selected project. Land Consolidation s the basic theoretical and practical background in land consolidation in the Czech Republic and includes the synthesis of sub-issues	KZ in a planning docu	5
155PUG The course provide stude	The course follows up three preceding courses in applied informatics. Students work in groups on selected project. Land Consolidation s the basic theoretical and practical background in land consolidation in the Czech Republic and includes the synthesis of sub-issues ents create a simple land consolidation project within the course in the selected area including designing of new features in common	KZ in a planning docu	5 Iments. The
155PUG The course provide stude 155TGD1	The course follows up three preceding courses in applied informatics. Students work in groups on selected project. Land Consolidation s the basic theoretical and practical background in land consolidation in the Czech Republic and includes the synthesis of sub-issues ents create a simple land consolidation project within the course in the selected area including designing of new features in common Theoretical geodesy 1	KZ in a planning docu measures plan. Z,ZK	5 uments. The 5
155PUG The course provide stude 155TGD1 Theoretical geodes	The course follows up three preceding courses in applied informatics. Students work in groups on selected project. Land Consolidation s the basic theoretical and practical background in land consolidation in the Czech Republic and includes the synthesis of sub-issues ents create a simple land consolidation project within the course in the selected area including designing of new features in common Theoretical geodesy 1 y 1 introduces the issue of creating positional, height and gravity geodetic foundations, definition and implementation of geodetic refer	KZ in a planning docu measures plan. Z,ZK ence systems - wo	5 uments. The 5
155PUG The course provide stude 155TGD1 Theoretical geodes	The course follows up three preceding courses in applied informatics. Students work in groups on selected project. Land Consolidation s the basic theoretical and practical background in land consolidation in the Czech Republic and includes the synthesis of sub-issues ents create a simple land consolidation project within the course in the selected area including designing of new features in common Theoretical geodesy 1 y 1 introduces the issue of creating positional, height and gravity geodetic foundations, definition and implementation of geodetic refer for the Czech Republic. It provides information about their origin and development, including the necessary theoretical basis of highe	KZ in a planning docu measures plan. Z,ZK ence systems - wo r geodesy.	5 Iments. The 5 rldwide and
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