Study plan

Name of study plan: Geodézie a kartografie, specializace Geomatika

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: Follow-up master full-time

Required credits: 120 Elective courses credits: 0 Sum of credits in the plan: 120

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: 54

The role of the block: Z

Code of the group: NH20230001

Name of the group: Geodézie a kartografie, spec. Geomatika, 1. semestr

Requirement credits in the group: In this group you have to gain at least 26 credits

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

Credits in the group: 26 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
101MM4G	Mathematics 4G Jozef Bobok Jozef Bobok Jozef Bobok (Gar.)	Z,ZK	4	2P+2C	Z	Z
155DPRZ	Remote Sensing Karel Pavelka Eva Matoušková Karel Pavelka (Gar.)	Z,ZK	5	2P+2C	Z	Z
155GPL2	Survey Sketches 2 Zden k Valenta Zden k Valenta (Gar.)	KZ	2	2C	Z	Z
155KAT3	Cartography 3 Ji í Cajthaml, Tomáš Janata, Petra Justová, Josef Münzberger Ji í Cajthaml Ji í Cajthaml (Gar.)	Z,ZK	5	2P+2C	Z	Z
155TGD3	Theoretical geodesy 3 Jan Holešovský Jan Holešovský (Gar.)	Z,ZK	5	2P+2C	Z	Z
155UZPR	Introduction to Spatial Data Processing Martin Landa Martin Landa Martin Landa (Gar.)	Z,ZK	5	2P+2C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=NH20230001 Name=Geodézie a kartografie, spec. Geomatika, 1. semestr

101MM4G	Mathematics 4G	Z,ZK	4			
https://mat.fsv.cvut.cz/	obok/					
155DPRZ	Remote Sensing	Z,ZK	5			
The subject is focused	on explanation of physical bases allowing to use remote sensing, on technical explanation of methods of data collection/meas	urement, on beha	vior of individual			
materials/land covers a	s an interaction with electromagnetic radiation, and on possibility to use RS for many applications.					
155GPL2	Survey Sketches 2	KZ	2			
Students will learn about	ut the preparation of geometric plans through practical exercises. It is mainly about the orientation of changes for updating the	e cadastral registe	r by various			
measuring technologie	s and the subsequent processing of geometric plans as a technical basis for the introduction of these changes into the cadastra	l register in location	ons with different			
technical conditions - a	nalogue cadastral map, digital cadastral map (DKM, KMD, etc.)					
155KAT3	Cartography 3	Z,ZK	5			
Advanced cartography	web map services and applications, dynamic maps, spatial data formats, data sources, standardization, web maps, trends in	cartography.				
155TGD3	Theoretical geodesy 3	Z,ZK	5			
Vector and scalar desc	ription of gravitational field of the Earth. Properties of gravitational potential and its derivatives for basic bodies. Description of	gravity field of the	e Earth. Normal			
gravity field of normal l	oodies. Approximation of the shape of the Earth in form of geoid or level ellipsoid. Stokes´ and Molodensky´s solution of the sh	nape of the Earth.	Consequences			
of this procedures for geodesy (geoid, quasigeoid, heights). Construction and models of (quasi)geoid. Physical priciples of gravity surveying.						
155UZPR	Introduction to Spatial Data Processing	Z,ZK	5			
The course focuses on automated processing of geospatial data. Practical exercises are divided into two parts. In the first part, the Python scripting language is used for data processing						
in combination with Ge	oPandas, Rasterio, Fiona and other libraries. The second part of the course is focused on geospatial data management in ob	ject-relational data	abase systems			

and their processing using spatial SQL. Free connection to the courses Informatics 2 - Database Systems, Informatics 3 - Object-oriented programming, GIS1 and GIS2.

Code of the group: NH20230002

Name of the group: Geodézie a kartografie, spec. Geomatika, 2. semestr

Requirement credits in the group: In this group you have to gain at least 16 credits

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

Credits in the group: 16 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
155FTG2	Photogrammetry 2 Karel Pavelka, Jan Pacina Karel Pavelka Karel Pavelka (Gar.)	Z,ZK	5	2P+2C	L	Z
155PKAR	Project - Cartography Ji í Cajthaml, Tomáš Janata Ji í Cajthaml Ji í Cajthaml (Gar.)	KZ	5	3C	L	Z
155TG4	Theoretical geodesy 4 Jakub Kostelecký Jakub Kostelecký Leoš Mervart (Gar.)	Z,ZK	5	2P+2C	L	Z
155VTTG	Fieldwork Training in Theoretical Geodesy 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=NH20230002 Name=Geodézie a kartografie, spec. Geomatika, 2. semestr

155FTG2	Dhotogrammatry 2	7 71/	F			
	Photogrammetry 2	Z,ZK	5			
Aerial photogrammetry. Relative and absolute orientation of aerial photos. Analogue, analytic and digital interpreting devices, computer support. Photogrammetric methods in mapping						
Orthophoto, its accura	acy. Photo triangulation, AAT, block and bundle adjustments, analytical photogrammetry. Digital photogrammetry, digital orthoph	oto, digital photo	grammetric			
stations, optical corre	ation systems, aerial laser scanning, using of drones (RPAS).					
155PKAR	Project - Cartography	KZ	5			
Map creation in GIS,	geodatabase, data model, symbology, compositional elements of maps, geographical nomenclature, errors in maps.		1			
155TG4	Theoretical geodesy 4	Z,ZK	5			
Theoretical Geodesy	4 introduces students to the field of space geodesy, i.e. using satellite observations of the Earth to define and maintain global o	oordinate system	is, the Earth			
orientation parameter	s, models of the Earth's gravity field and ocean topography. The outputs of space geodesy form the basis from which one of the	most widely use	d measurement			
techniques in geodes	y GNSS is based.					
155VTTG	Fieldwork Training in Theoretical Geodesy	KZ	1			
Landsurveying in terrain is intended for the practice of measurement methods of geodesy and data processing work in the creation of a point field. Includes tasks: Long Range						
Triangulation and Trilateration (TRG) Determining the course of the quasi-geoid (GEO) Remeasurement and adjustment of height points with very precise leveling (VPN) Azimuth						
determination using the	determination using the gyrotheodolite, gravimetric measurements					

Code of the group: NH20230003

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

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 3 courses

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
155MSPD	Modern Methods of Spatial Data Acquisition Karel Pavelka, Jan Pacina Karel Pavelka Karel Pavelka (Gar.)	Z,ZK	5	2P+2C	Z	Z
155PKAZ	Law in Cadastre and Surveying Iveta Bláhová Iveta Bláhová (Gar.)	ZK	2	2P	Z	Z
155VFG	Photogrammetry -Project Karel Pavelka, Jind ich Hoda Karel Pavelka Karel Pavelka (Gar.)	KZ	5	3C	Z	Z

Characteristics of the courses of this group of Study Plan: Code=NH20230003 Name=Geodézie a kartografie, spec. Geomatika, 3. semestr

155MSPD	Modern Methods of Spatial Data Acquisition	Z,ZK	5			
The course focuses on	The course focuses on new modern and unconventional methods of geospatial data collection and presentation. Contains information on terrestrial, aerial and mobile laser scanning,					
about remote sensing and its methods, about hyperspectral imaging. Further, it focuses on the progressive method in geomathics - on RPAS. It informs about types, usage, legislation						
as well as about sensors and software for automatically processing for image data. Finally, geophysical methods and virtual reality technologies are presented.						

155PKAZ Law in Cadastre and Surveying

K.

Public and private, substantive and procedural law. Overview of legal regulations governing the cadastre of real estate (CN) and land surveying. Predecessors of surveying and cadastral authorities in the past. Surveying and cadastral authorities today. Thing, thing in the legal sense, division of things, immovable things, part of a thing and accessories of a thing. Land, parcel of land, land in jurisprudence, building, building in jurisprudence, small buildings, temporary buildings, building, unit. Origin of the CN and its predecessors, the Cadastral Act and implementing regulations, definition and purpose of the CN. Content of the CN, cadastral register, registration of rights in the CN, basic provisions. Rights entered into the CN by deposit, title deed, proposal for deposit, annexes to the proposal, deposit procedure. Deposit procedure, record, note. Administration of the CN, entries of other data, acceptance of data, time limits for entry in the CN, deposit of documents in the collection of documents, revision of the CN, correction of errors, obligations of owners and other beneficiaries, municipalities and public authorities. Surveying activities and geometrical plans, publicity of the CN, provision of CN data, offences, common, transitional and final provisions of the Cadastral Act. Real estate contracts. Previous legislation on land surveying, Land Surveying Act, introductory provisions, surveying activities. Rights and obligations in carrying out surveying activities, verification of results of surveying activities, geodetic reference systems and state mapping works, offences. Visit to the land register in the building of the Surveying and Cadastral Authorities in Prague Kobylisy.

155VFG Photogrammetry - Project

ΚZ

5

practical metrical documentation of historical objects and sites, technology of documentation and data processing by modern methods

Name of the block: Compulsory elective courses Minimal number of credits of the block: 36

The role of the block: S

Code of the group: NH20230001_1

Name of the group: Geodézie a kartografie, spec. Geomatika, PV p edm ty, 1. semestr

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

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

Credits in the group: 4 Note on the group:

11010 011 1110 5	Name of the course / Name of the group of courses		I	1	1 1	
Code	(in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
128TG	Graph Theory Ji í Demel Ji í Demel (Gar.)	Z,ZK	4	2P+2C	Z	S
155YCN1	Real Estate Valuation Eliška Housarová Eliška Housarová (Gar.)	Z,ZK	4	2P+2C	Z	S
155YGEI	Geoinformatics Ji í Cajthaml, Tomáš Janata, Lena Halounová, Tomáš Bayer, Markéta Pot ková Tomáš Bayer Tomáš Bayer (Gar.)	Z,ZK	4	2P+2C	Z	S

Characteristics of the courses of this group of Study Plan: Code=NH20230001_1 Name=Geodézie a kartografie, spec. Geomatika, PV p edm ty, 1. semestr

128TG	Graph Theory	Z,ZK	4				
Graph theory - basic ele	Graph theory - basic elements, graph tasks formulations, basic algorithms with recognition of calculation efficiency. Connectivity, strong connectivity, trees, spanning trees, flows in						
networks, matchings, et	ulerian trails, hamiltonian paths, independent sets, cliques, coloring, plannar graphs.						
155YCN1	Real Estate Valuation	Z,ZK	4				
Real estate valuation is	a very large field that intersects various areas such as construction, insurance, government, banking and land registry. Durir	ng the lectures we	will cover the				
basic concepts of real estate, methods of real estate valuation, for what purpose and when to use them. Market valuation - cost, comparative and income methods. Administrative							
valuation of real estate, valuation of easements and valuation of real estate in special cases such as loans, inheritance, community property, for insurance companies, etc.							
155VGEL	Geoinformatics	7 7K	1				

Code of the group: NH20230002_1

Name of the group: Geodézie a kartografie, spec. Geomatika, PV p edm ty, 2. 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
101STAG	Statistics Jana Nosková Jana Nosková (Gar.)	Z,ZK	5	2P+2C	L	S
128YNAA	Design and Analysis of Algorithms Ji í Demel Ji í Demel Ji í Demel (Gar.)	Z,ZK	4	2P+2C	L	S
155ADKI	Algorithms in Digital Cartography and GIS Tomáš Bayer Tomáš Bayer Tomáš Bayer (Gar.)	Z,ZK	5	2P+2C	L	S
155FGIS	Free Software GIS Martin Landa, Ond ej Pešek, Linda Karlovská Martin Landa Lena Halounová (Gar.)	Z,ZK	5	2P+2C	L	S

155IN4G	Informatics 4 Jan Pytel Jan Pytel (Gar.)	Z,ZK	5	2P+2C	L	S	
155YWEK	Web Cartography Ji í Cajthaml, Tomáš Janata, Petra Justová, František Mužík Ji í Cajthaml Ji í Cajthaml (Gar.)	Z,ZK	5	2P+2C	L	S	
155YZPZ	Processing of Remote Sensing Data	Z,ZK	5	2P+2C	L	S	

Characteristics of the courses of this group of Study Plan: Code=NH20230002_1 Name=Geodézie a kartografie, spec. Geomatika, PV p edm tv. 2. semestr

101STAG	Statistics	Z,ZK	5			
Advanced methods of a						
128YNAA	Design and Analysis of Algorithms	Z,ZK	4			
Design and analysis of	Design and analysis of alorithms. Models of a computation. Proofs of correctness, time complexity of algorithms. Basic data structures. P and NP classes of problems.					
155ADKI	Algorithms in Digital Cartography and GIS	Z,ZK	5			
Automation of digital cartography tasks using rule-based strategies. Implementation of selected cartographic problems in a chosen programming language. Preparation and design of						
graphical outputs in Qt library.						
155FGIS	Free Software GIS	Z,ZK	5			

Free and open source software in geoinformation technologies. Emphasis is placed on the framework orientation in the issue. A comprehensive overview of available tools, their use and deployment in practical applications is provided during the course. In the exercises, students are introduced to desktop tools such as GRASS GIS, QGIS, SAGA or gvSig, GDAL, PROJ, PDAL libraries and other similar tools. Part of the course focuses on active scripting and developing plugins using the Python programming language. In addition, the students will get a general introduction to publishing geographic data and implementing GIS analyses in the Internet environment, GeoServer and MapServer, pygeoapi and OWSLib libraries, publishing platforms such as Gisquick, GeoNode and Margin Maps. Also mentioned are the issues of freely available geographic data, open geodata, and active data collection for the OpenStreetMap community project. Automation of deployment using Ansible and Docker technologies is mentioned in passing. Teaching is implemented on the open source platform GIS lab

155IN4G Informatics 4 Z,ZK 5 In the course, students are introduced to techniques how to handle big amount of data. The course starts with data preprocessing by command tools before import into DB. The focus is related to relation databases, NoSQL databases, ElasticSearch, R and cloud.

155YWEK	Web Cartography	Z,ZK	5
155YZPZ	Processing of Remote Sensing Data	Z,ZK	5

Digital image data processing collected mainly by satellite apparatuses. Practical methods of image data processing, their interpretation and classification. Individual themes depend on goals and themes of individual diploma thesis. 1. The Diploma Thesis (DT) topic analysis 2. Suitable source material selection 3. Geometric corrections of the processed data and their accuracy 4. Radiometric corrections of the processed data 5. Enhancement of individual bands 6. Multi-channel enhancement for DT - new channels calculation 7. Calculation of new channels by transformation to other systems - IHS, PCA, PCCA, 8. Classification pixel per pixel focused on DT goal 9. Image segmentation with various number of channels 10. Object oriented classification 11. Comparison of results - total, user's, producer's accuracy 12. Post-classification procedures to improve accuracy 13. Outputs - statistical, image, GIS

Code of the group: NH20230003_1

Name of the group: Geodézie a kartografie, spec. Geomatika, PV p edm ty, 3. 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
101PJS	Statistics Jana Nosková Jana Nosková Jana Nosková (Gar.)	KZ	5	3C	Z	S
143YKIG	GIS in Landscape Engineering Josef Krása Josef Krása Josef Krása (Gar.)	KZ	4	3C	Z	S
155YDPD	Visualization and Distribution of Spatial Data David Zahradník David Zahradník (Gar.)	Z,ZK	5	2P+2C	Z	S
155YFD	Photogrammetric Documentation of Historical Buildings and Sites Jind ich Hoda Jind ich Hoda (Gar.)	KZ	4	3C	Z	S
155YOPR	Object Oriented Programming Jan Pytel Jan Pytel (Gar.)	Z,ZK	5	2P+2C	Z	S
155YSKN	Information System of Cadastre of Real Estate Petr Sou ek Petr Sou ek (Gar.)	KZ	5	1P+2C	Z	S
155YUSU	Introduction to Machine Learning in Remote Sensing Martin Landa, Ond ej Pešek, Tomáš Bayer Martin Landa Martin Landa (Gar.)	Z,ZK	5	2P+2C	Z	S
155YV3D	Visualization of 3D Models with Modern Technologies Karel Pavelka, Ji í Cajthaml, František Mužík, Karel Pavelka, Vojt ch Cehák, Pavel Tobiáš, Michal Janovský Karel Pavelka Karel Pavelka (Gar.)	Z,ZK	5	2P+2C	Z	S

Characteristics of the courses of this group of Study Plan: Code=NH20230003_1 Name=Geodézie a kartografie, spec. Geomatika, PV p edm ty, 3. semestr

	101PJS	Statistics	KZ	5
- 1	Students solve one part	icular problem of probability, mathematical statistics, geodesis or data analysis using advanced packages of software R-proje	ect.	

143YKIG	GIS in Landscape Engineering	KZ	4
Basic tasks of landsc	cape engineering and their connection to geoinformation technologies (agriculture, water management, landscape planning).		•
155YDPD	Visualization and Distribution of Spatial Data	Z,ZK	5
This course focuses of	on the digital modelling of a historic city and the subsequent presentation of the results on the web. Students will learn about the	various tools and	techniques used
in digital modeling an	nd spatial visualization. The main objective is to create a historical city model using Blender and then present it on a web page.		
155YFD	Photogrammetric Documentation of Historical Buildings and Sites	KZ	4
This course is organia	zed in a project-based manner. Students will gain an overview of the methods and technologies currently used in the measure	ment documentati	on of historical
objects and archaeolo	ogical sites. The students will learn in detail about the production of various types of measurement documentation (2D building plai	ns, 3D models, 2D	photogrammetric
outputs - photoplan, o	orthophoto, etc.) and the specifics of this type of work. Students will acquire theoretical knowledge and practical skills that will	enable them to use	e individual
documentation method	ods and technologies in their practice in projects in the field of heritage conservation. The course includes several lectures/sen	ninars with invited	practitioners
(surveyor archaeolog			
(surveyor, archaeolog	gist, conservationist). In the practical part, students will prepare a measurement documentation of a part of a selected object (in	ncluding data colle	ction in the field).
	jist, conservationist). In the practical part, students will prepare a measurement documentation of a part of a selected object (li Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III.	ncluding data colle	ction in the field).
		Z,ZK	ction in the field).
Students of the Facul 155YOPR	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III.		
Students of the Facul 155YOPR	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III. Object Oriented Programming		
Students of the Facul 155YOPR This course extends ' 155YSKN	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III. Object Oriented Programming "Informatics 3" course by object-oriented techniques demonstrated in C++ and Python programming languages.	Z,ZK	5
Students of the Facul 155YOPR This course extends ' 155YSKN The aim of the course	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III. Object Oriented Programming "Informatics 3" course by object-oriented techniques demonstrated in C++ and Python programming languages. Information System of Cadastre of Real Estate	Z,ZK	5
Students of the Facul 155YOPR This course extends ' 155YSKN The aim of the course	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III. Object Oriented Programming "Informatics 3" course by object-oriented techniques demonstrated in C++ and Python programming languages. Information System of Cadastre of Real Estate e is to familiarize students with the Information System of the Cadastre of Real Estate (ISKN) and its connection to other information.	Z,ZK	5
Students of the Facul 155YOPR This course extends ' 155YSKN The aim of the course administration, especi	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III. Object Oriented Programming "Informatics 3" course by object-oriented techniques demonstrated in C++ and Python programming languages. Information System of Cadastre of Real Estate e is to familiarize students with the Information System of the Cadastre of Real Estate (ISKN) and its connection to other information to the system of Basic Registers as defined by Act No. 111/2009 Coll.	Z,ZK KZ mation systems of	5 the state
Students of the Facul 155YOPR This course extends ' 155YSKN The aim of the course administration, especi 155YUSU Machine learning is a	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III. Object Oriented Programming Informatics 3" course by object-oriented techniques demonstrated in C++ and Python programming languages. Information System of Cadastre of Real Estate is to familiarize students with the Information System of the Cadastre of Real Estate (ISKN) and its connection to other information to the system of Basic Registers as defined by Act No. 111/2009 Coll. Introduction to Machine Learning in Remote Sensing	Z,ZK KZ mation systems of Z,ZK cquire basic knowl	5 the state 5 edge of machine
Students of the Facul 155YOPR This course extends ' 155YSKN The aim of the course administration, especi 155YUSU Machine learning is a learning algorithms and	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III. Object Oriented Programming Informatics 3" course by object-oriented techniques demonstrated in C++ and Python programming languages. Information System of Cadastre of Real Estate e is to familiarize students with the Information System of the Cadastre of Real Estate (ISKN) and its connection to other information to the system of Basic Registers as defined by Act No. 111/2009 Coll. Introduction to Machine Learning in Remote Sensing an integral part of data analysis and predictive modelling in many fields, including remote sensing. The aim of the course is to a	Z,ZK KZ mation systems of Z,ZK cquire basic knowl gned examples of r	5 the state 5 edge of machine nachine learning
Students of the Facul 155YOPR This course extends ' 155YSKN The aim of the course administration, especi 155YUSU Machine learning is a learning algorithms a applications using rer	Ity of Architecture also participate in this practical part within the "sister" course Monument Conservation III. Object Oriented Programming "Informatics 3" course by object-oriented techniques demonstrated in C++ and Python programming languages. Information System of Cadastre of Real Estate e is to familiarize students with the Information System of the Cadastre of Real Estate (ISKN) and its connection to other information to the system of Basic Registers as defined by Act No. 111/2009 Coll. Introduction to Machine Learning in Remote Sensing an integral part of data analysis and predictive modelling in many fields, including remote sensing. The aim of the course is to a and principles of model generalization and practical design of process lines. In the course, students work independently on assign	Z,ZK KZ mation systems of Z,ZK cquire basic knowl gned examples of r	5 the state 5 edge of machine nachine learning

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

Code of the group: NH20230004

Name of the group: Geodézie a kartografie, spec. Geomatika, 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
154DPM	Diploma Thesis Martin Štroner Martin Štroner (Gar.)	Z	30	24C	Z,L	S1
155DPM	Diploma Thesis Eva Matoušková, Ji í Cajthaml, Tomáš Janata, Jan Holešovský, Jind ich Hoda , Zden k Vysko il, Lena Halounová, Jan Pytel, Petr Sou ek, Ji í Cajthaml Ji í Cajthaml (Gar.)	Z	30	24C	Z,L	S1

Characteristics of the courses of this group of Study Plan: Code=NH20230004 Name=Geodézie a kartografie, spec. Geomatika, diplomová práce

154DPM	Diploma Thesis	Z	30
Final thesis, prepared a	ccording to the assignment.	•	
155DPM	Diploma Thesis	Z	30
in accordance with the	thesis proposal	•	•

List of courses of this pass:

Code	Name of the course	Completion	Credits		
101MM4G	Mathematics 4G	Z,ZK	4		
	https://mat.fsv.cvut.cz/bobok/	'	•		
101PJS	Statistics	KZ	5		
Stud	dents solve one particular problem of probability, mathematical statistics, geodesis or data analysis using advanced packages of soft	ware R-project.	•		
101STAG	Statistics	Z,ZK	5		
	Advanced methods of mathematical statistics. Sequential tests, bayesian and robust methods. Software R-project.				

128TG	Graph Theory	Z,ZK	4
Graph theory - ba	sic elements, graph tasks formulations, basic algorithms with recognition of calculation efficiency. Connectivity, strong connectivity, tre	,	es, flows in
	networks, matchings, eulerian trails, hamiltonian paths, independent sets, cliques, coloring, plannar graphs.		
128YNAA	Design and Analysis of Algorithms	Z,ZK	4
	analysis of alorithms. Models of a computation. Proofs of correctness, time complexity of algorithms. Basic data structures. P and NP		
143YKIG	GIS in Landscape Engineering	KZ	4
	lasic tasks of landscape engineering and their connection to geoinformation technologies (agriculture, water management, landscape		20
154DPM	Diploma Thesis Final thesis, prepared according to the assignment.	Z	30
155ADKI	Algorithms in Digital Cartography and GIS	Z.ZK	5
	al cartography tasks using rule-based strategies. Implementation of selected cartographic problems in a chosen programming langua	,	1
tatomation or algite	graphical outputs in Qt library.	gori roparanon a	a accigii c
155DPM	Diploma Thesis	Z	30
ľ	in accordance with the thesis proposal		'
155DPRZ	Remote Sensing	Z,ZK	5
he subject is focus	ed on explanation of physical bases allowing to use remote sensing, on technical explanation of methods of data collection/measurem	nent, on behavior	of individua
	materials/land covers as an interaction with electromagnetic radiation, and on possibility to use RS for many applications.		
155FGIS	Free Software GIS	Z,ZK	5
	rce software in geoinformation technologies. Emphasis is placed on the framework orientation in the issue. A comprehensive overview		
	practical applications is provided during the course. In the exercises, students are introduced to desktop tools such as GRASS GIS, C es and other similar tools. Part of the course focuses on active scripting and developing plugins using the Python programming langu	_	-
	es and other similar tools. Part of the course focuses on active scripting and developing plugins using the Python programming langu troduction to publishing geographic data and implementing GIS analyses in the Internet environment, GeoServer and MapServer, pyt		
	s such as Gisquick, GeoNode and Margin Maps. Also mentioned are the issues of freely available geographic data, open geodata, and		
• .	mmunity project. Automation of deployment using Ansible and Docker technologies is mentioned in passing. Teaching is implemented		
	GIS.lab.		•
155FTG2	Photogrammetry 2	Z,ZK	5
	etry. Relative and absolute orientation of aerial photos. Analogue, analytic and digital interpreting devices, computer support. Photogram		
Orthophoto, its a	ccuracy. Photo triangulation, AAT, block and bundle adjustments, analytical photogrammetry. Digital photogrammetry, digital orthopho	to, digital photog	rammetric
	stations, optical correlation systems, aerial laser scanning, using of drones (RPAS).		_
155GPL2	Survey Sketches 2	KZ	2
	n about the preparation of geometric plans through practical exercises. It is mainly about the orientation of changes for updating the c	_	-
neasuring technolo	gies and the subsequent processing of geometric plans as a technical basis for the introduction of these changes into the cadastral reg technical conditions - analogue cadastral map, digital cadastral map (DKM, KMD, etc.)	ister in locations	with differen
155IN4G	Informatics 4	Z.ZK	5
	ents are introduced to techniques how to handle big amount of data. The course starts with data preprocessing by command tools bef	,	-
in the course, stude	is related to relation databases, NoSQL databases, ElasticSearch, R and cloud.	ore import into D	D. THE locus
155KAT3	Cartography 3	7 7K	5
155KAT3 Advanced	Cartography 3 d cartography, web map services and applications, dynamic maps, spatial data formats, data sources, standardization, web maps, tre	Z,ZK nds in cartograph	5 ny.
	d cartography, web map services and applications, dynamic maps, spatial data formats, data sources, standardization, web maps, tre	nds in cartograph	I .
Advanced 155MSPD		nds in cartograph	ny. 5
Advanced 155MSPD The course focuses	d cartography, web map services and applications, dynamic maps, spatial data formats, data sources, standardization, web maps, tre Modern Methods of Spatial Data Acquisition	nds in cartograph Z,ZK al and mobile las	by. 5 er scanning
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155VTTG	Fieldwork Training in Theoretical Geodesy	KZ	1
	in terrain is intended for the practice of measurement methods of geodesy and data processing work in the creation of a point field. Ir		1 .
	I Trilateration (TRG) Determining the course of the quasi-geoid (GEO) Remeasurement and adjustment of height points with very pre		
mangulation and	determination using the gyrotheodolite, gravimetric measurements	cise leveling (vi i	N) Azimum
155YCN1	Real Estate Valuation	Z,ZK	4
	tion is a very large field that intersects various areas such as construction, insurance, government, banking and land registry. During		1
	f real estate, methods of real estate valuation, for what purpose and when to use them. Market valuation - cost, comparative and inco		
	eal estate, valuation of easements and valuation of real estate in special cases such as loans, inheritance, community property, for in		
155YDPD	Visualization and Distribution of Spatial Data	Z,ZK	5
	s on the digital modelling of a historic city and the subsequent presentation of the results on the web. Students will learn about the vari		-
	digital modeling and spatial visualization. The main objective is to create a historical city model using Blender and then present it on		•
155YFD	Photogrammetric Documentation of Historical Buildings and Sites	KZ	4
	anized in a project-based manner. Students will gain an overview of the methods and technologies currently used in the measuremen		of historical
objects and archae	ological sites. The students will learn in detail about the production of various types of measurement documentation (2D building plans, 3I	D models, 2D phot	ogrammetri
outputs - photop	lan, orthophoto, etc.) and the specifics of this type of work. Students will acquire theoretical knowledge and practical skills that will er	able them to use	individual
documentation n	nethods and technologies in their practice in projects in the field of heritage conservation. The course includes several lectures/semin	ars with invited pr	actitioners
(surveyor, archaeo	ogist, conservationist). In the practical part, students will prepare a measurement documentation of a part of a selected object (includ	ing data collectior	in the field)
	Students of the Faculty of Architecture also participate in this practical part within the "sister" course Monument Conservation	III.	
155YGEI	Geoinformatics	Z,ZK	4
155YOPR	Object Oriented Programming	Z,ZK	5
	This course extends "Informatics 3" course by object-oriented techniques demonstrated in C++ and Python programming langu	ages.	
155YSKN	Information System of Cadastre of Real Estate	KZ	5
The aim of the	course is to familiarize students with the Information System of the Cadastre of Real Estate (ISKN) and its connection to other inform	ation systems of	the state
	administration, especially to the system of Basic Registers as defined by Act No. 111/2009 Coll.		
155YUSU	Introduction to Machine Learning in Remote Sensing	Z,ZK	5
Machine learning is	an integral part of data analysis and predictive modelling in many fields, including remote sensing. The aim of the course is to acquir	e basic knowledge	of machine
learning algorithms	and principles of model generalization and practical design of process lines. In the course, students work independently on assigned	examples of macl	nine learning
applications using	remote sensing data. A prerequisite for the course is correct generalization of the trained model, including theoretical evaluation of over	erfitting and under	fitting. In the
	projects, students create their own Python scripts and critically evaluate the results.		
155YV3D	Visualization of 3D Models with Modern Technologies	Z,ZK	5
155YWEK	Web Cartography	Z,ZK	5
	Trob Cartography		
155YZPZ	Processing of Remote Sensing Data	Z,ZK	5
155YZPZ	<u> </u>	Z,ZK	_
155YZPZ Digital image data	Processing of Remote Sensing Data	Z,ZK on. Individual the	nes depend
155YZPZ Digital image data on goals and them	Processing of Remote Sensing Data processing collected mainly by satellite apparatuses. Practical methods of image data processing, their interpretation and classificating the control of	Z,ZK on. Individual theons of the process	nes depend ed data and
155YZPZ Digital image data on goals and them their accuracy 4. R	Processing of Remote Sensing Data processing collected mainly by satellite apparatuses. Practical methods of image data processing, their interpretation and classificati es of individual diploma thesis. 1. The Diploma Thesis (DT) topic analysis 2. Suitable source material selection 3. Geometric corrections.	Z,ZK on. Individual then ons of the process els calculation 7. C	mes depend ed data and calculation of

For updated information see http://bilakniha.cvut.cz/en/FF.html Generated: day 2025-07-20, time 12:42.