

## Study plan

**Name of study plan: obor Geodézie a kartografie, zam ení Teoretická geodézie**

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Geodesy and Cartography

Garantor of the study branch: prof. Ing. Martin Štroner, Ph.D.

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:

Name of the block: Compulsory courses

Minimal number of credits of the block: 71

The role of the block: Z

Code of the group: NG20150100

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

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

Requirement courses in the group: In this group you have to complete at least 5 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
101NMG	<b>Numerical Analysis</b>	Z,ZK	6	2P+2C	L	z
154ING2	<b>Engineering Surveying 2</b> Martin Štroner <b>Martin Štroner</b> Martin Štroner (Gar.)	Z,ZK	5	2P+2C	Z	z
155KANE	<b>Cadastre of Real Estate</b> Karel Benda	Z,ZK	6	3P+2C		z
155MSGA	<b>System MicroStation in Geodetic Applications</b> Petr Soukup	Z	3	2C		z
155TG3	<b>Theoretical geodesy 3</b> Jan Holešovský	Z,ZK	6	3P+2C	Z	z

**Characteristics of the courses of this group of Study Plan: Code=NG20150100 Name=obor Geodézie a kartografie, 1. semestr**

101NMG	Numerical Analysis	Z,ZK	6
154ING2	Engineering Surveying 2 Planning and evaluating of precision of the geodetic activities, evaluation of precision of measurement and setting-out of distances, angles and verticals including sources of errors. Geodetic setting-out networks positional, altimetric and spatial (derivation of precision), evaluation of precision of positional and altimetric setting-out of elementary parts of a building structure, derivation of main elements of transition curve including solution of circular arcs with transition curves, evaluation of precision and provableness of building structures shifts and deformations.	Z,ZK	5
155KANE	Cadastre of Real Estate History of land registration in the CR. Stable and land cadastre. Land registration and development of title registration. Subject and content of cadastre of real estates. Cadastral information system ISKN. Organisation of surveying agency. Administration and maintenance of cadastre - measurements, calculations, visualisation and documentation. Geometric plan. Setting-out of property boundaries. Legal relations to real estates, cadastral registration.	Z,ZK	6
155MSGA	System MicroStation in Geodetic Applications	Z	3
155TG3	Theoretical geodesy 3	Z,ZK	6

Code of the group: NG20150200

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

Requirement credits in the group: In this group you have to gain 22 credits

Requirement courses in the group: In this group you have to complete at least 5 courses

Credits in the group: 22

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
154ING3	<b>Engineering Surveying 3</b> Jaromír Procházka <b>Martin Stroner</b> Jaromír Procházka (Gar.)	Z,ZK	5	2P+2C	L	z
155FTG2	<b>Photogrammetry 2</b> Karel Pavelka, Jan Pacina <b>Karel Pavelka</b> Karel Pavelka (Gar.)	Z,ZK	5	2P+2C	L	z
155PKNZ	<b>Law in Cadastre and Surveying</b>	ZK	3	2P	L	z
155TG4	<b>Theoretical geodesy 4</b> Jakub Kostecký <b>Jakub Kostecký</b> Jakub Kostecký (Gar.)	Z,ZK	5	2P+2C		z
155VGM	<b>Field Training in Cadastre</b> Karel Benda	KZ	4	4C	L	z

**Characteristics of the courses of this group of Study Plan: Code=NG20150200 Name=obor Geodézie a kartografie, 2. semestr**

154ING3	Engineering Surveying 3	Z,ZK	5	Legislative regulations for geodetic activities in the capital construction, technical standards, geodetic ground for designing, geodetic activities in the building structures, transportation engineering, water resource management, industry and energetics (specificities of setting-out, check of geometrical parameters of structures, rectification of technological equipment etc.).		
155FTG2	Photogrammetry 2	Z,ZK	5	* 1. Evaluation with known external orientation parameters * 2. Requirement of coplanarity, requirement of zero vertical parallax, numerical determination of external orientation elements - overview * 3. Relative orientation (RO), RO of independent stereo-pairs, RO by image attachment, absolute orientation * 4. Complex solution, etape-solution, bundle adjustment * 5. Image triangulation, use, types * 6. Digital photogrammetry, digital image, principle, scanners, scanning, DPI, accuracy, data quantity * 7. Correlation technique, principle, utilization, automatic searching in raster image * 8. Digital orthophoto, types, interpolation, principle, algorithm, usage, problems * 9. Subpixel transformation * 10. Digital workstations, devices and processing systems * 11. Image transformations, Direct and Indirect methods, reasons to use * 12. Aerial laser scanning, utilization and products in the Czech Republic *13. RPAS methods (drones)		
155PKNZ	Law in Cadastre and Surveying	ZK	3	Legal and technical background of the Czech Cadastre, relation between cadastre and land books, cadastral law of 1927. Surveying and cadastral bodies. Basic surveying laws and regulations, special application of subjects. Forms of public rights, current in-force legal documents in surveying sector.		
155TG4	Theoretical geodesy 4	Z,ZK	5	Astronomical coordinate systems. Kepler's and disturbed motion of the satellites. Time learning. Precessions and nutation. Phenomena of the aberration type. Observation methods of cosmic geodesy. Geodetic satellites. Dynamic method of space geodesy. Space coordinate systems. Application to determine the Earth's gravity field parameters. Satellite Earth Observation Missions (CHAMP, GRACE, GOCE).		
155VGM	Field Training in Cadastre	KZ	4	Works in minor horizontal control for renewal and administration of cadastre of real estate. Detailed planimetry and altimetry measurements, revision of cadastre, setting-out of property boundaries.		

Code of the group: NG20150300

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

Requirement credits in the group: In this group you have to gain 23 credits

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

Credits in the group: 23

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
154EKZ	<b>Economy in Land Surveying and Cadastre of Real Estates</b> Rudolf Urban <b>Rudolf Urban</b> Rudolf Urban (Gar.)	ZK	2	2P+1C	Z	z
154ING4	<b>Engineering Surveying 4</b> Pavel Hánek <b>Rudolf Urban</b> Pavel Hánek (Gar.)	Z,ZK	5	2P+2C	Z	z
154VTIG	<b>Engineering Surveying Fieldwork Training</b> <b>Tomáš Jiřikovský</b> Tomáš Jiřikovský (Gar.)	KZ	4	4C	L	z
155GEPL	<b>Survey Sketches</b> Karel Benda	Z	2	2C		z
155PRGE	<b>Project - Theoretical Ggeodesy</b>	KZ	5	3C	L	z
155VFG	<b>Photogrammetry -Project</b> Karel Pavelka, Jindřich Hoda <b>Jindřich Hoda</b> Karel Pavelka (Gar.)	KZ	5	3C	Z	z

**Characteristics of the courses of this group of Study Plan: Code=NG20150300 Name=obor Geodézie a kartografie, 3. semestr**

154EKZ	Economy in Land Surveying and Cadastre of Real Estates	ZK	2			
154ING4	Engineering Surveying 4	Z,ZK	5			
154VTIG	Engineering Surveying Fieldwork Training	KZ	4	Measurement and calculation of the geodetic micronetwork for industry purposes, precise height measurement, method of temporary stations, calculation of setting-out elements, setting-out of a construction with check measurement, setting out of the road arc with transitive curves, longitudinal profile and cross sections, measurement of spatial setting-out network using electronic tacheometer, including evaluation of accuracy.		
155GEPL	Survey Sketches	Z	2			
155PRGE	Project - Theoretical Ggeodesy	KZ	5			
155VFG	Photogrammetry -Project	KZ	5	practical documentation of historical objects, technology of documentation and data processing by modern methods		

Name of the block: Povinné p edm ty zam ení

Minimal number of credits of the block: 19

The role of the block: PZ

Code of the group: NG20150001

Name of the group: obor G, zam ení Teoretická geodézie, p edm ty zam ení

Requirement credits in the group: In this group you have to gain at least 19 credits (at most 30)

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

Credits in the group: 19

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
155GNSS	<b>Applications of GNSS</b>	ZK	4	3P		PZ
155FG1	<b>Physical geodesy T1</b> <i>Jan Holešovský</i>	ZK	4	2P	L	PZ
155KGT	<b>Space Ggeodesy T</b>	ZK	4	2P		PZ
155TPR	<b>Probability and Statistics</b>	KZ	2	2P+1C	Z	PZ
155YGG	<b>Geophysics and geodynamics</b> <i>Jan Holešovský</i>	Z,ZK	3	2P+1C	Z	PZ
155ZTMG	<b>Fundamentals of Theoretical Mechanics</b>	Z	2	2C	Z	PZ

Characteristics of the courses of this group of Study Plan: Code=NG20150001 Name=obor G, zam ení Teoretická geodézie, p edm ty zam ení

155GNSS	Applications of GNSS			ZK	4
155FG1	Physical geodesy T1			ZK	4
155KGT	Space Ggeodesy T			ZK	4
155TPR	Probability and Statistics			KZ	2
155YGG	Geophysics and geodynamics			Z,ZK	3
155ZTMG	Fundamentals of Theoretical Mechanics			Z	2

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: NG20150400\_1

Name of the group: obor Geodézie a kartografie, diplomová práce

Requirement credits in the group: In this group you have to gain 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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
101DPM	<b>Diploma Thesis</b> <i>Daniela Jarušková, Michal Beneš, Milan Bo ík, Jakub Šolc, Jana Nosková Daniela Jarušková (Gar.)</i>	Z	30	24C	Z	S1
102DPM	<b>Diploma Thesis</b> <i>Pavel Novák, Petr Pokorný, Alexey Sveshnikov Ji í Novák</i>	Z	30	24C	Z	S1
154DPM	<b>Diploma Thesis</b> <i>Martin Štroner</i>	Z	30	24C	Z,L	S1
155DPM	<b>Diploma Thesis</b> <i>Jind ich Hoda , Jan Holešovský, Karel Benda, Zden k Vysko il, Ji í Cajthaml, Petr Sou ek, Zden k Lukeš, Aleš epek, Lena Halounová, ..... Ji í Cajthaml</i>	Z	30	24C	Z,L	S1

Characteristics of the courses of this group of Study Plan: Code=NG20150400\_1 Name=obor Geodézie a kartografie, diplomová práce

101DPM	Diploma Thesis			Z	30
102DPM	Diploma Thesis			Z	30
in accordance with the thesis proposal					
154DPM	Diploma Thesis			Z	30
in accordance with the thesis proposal					

### List of courses of this pass:

Code	Name of the course	Completion	Credits
101DPM	Diploma Thesis	Z	30
101NMG	Numerical Analysis	Z,ZK	6
102DPM	Diploma Thesis in accordance with the thesis proposal	Z	30
154DPM	Diploma Thesis in accordance with the thesis proposal	Z	30
154EKZ	Economy in Land Surveying and Cadastre of Real Estates	ZK	2
154ING2	Engineering Surveying 2 Planning and evaluating of precision of the geodetic activities, evaluation of precision of measurement and setting-out of distances, angles and verticals including sources of errors. Geodetic setting-out networks positional, altimetric and spatial (derivation of precision), evaluation of precision of positional and altimetric setting-out of elementary parts of a building structure, derivation of main elements of transition curve including solution of circular arcs with transition curves, evaluation of precision and provableness of building structures shifts and deformations.	Z,ZK	5
154ING3	Engineering Surveying 3 Legislative regulations for geodetic activities in the capital construction, technical standards, geodetic ground for designing, geodetic activities in the building structures, transportation engineering, water resource management, industry and energetics (specificities of setting-out, check of geometrical parameters of structures, rectification of technological equipment etc.).	Z,ZK	5
154ING4	Engineering Surveying 4	Z,ZK	5
154VTIG	Engineering Surveying Fieldwork Training Measurement and calculation of the geodetic micronetwork for industry purposes, precise height measurement, method of temporary stations, calculation of setting-out elements, setting-out of a construction with check measurement, setting out of the road arc with transitive curves, longitudinal profile and cross sections, measurement of spatial setting-out network using electronic tacheometer, including evaluation of accuracy.	KZ	4
155DPM	Diploma Thesis in accordance with the thesis proposal	Z	30
155FG1	Physical geodesy T1	ZK	4
155FTG2	Photogrammetry 2 * 1. Evaluation with known external orientation parameters * 2. Requirement of coplanarity, requirement of zero vertical parallax, numerical determination of external orientation elements - overview * 3. Relative orientation (RO), RO of independent stereo-pairs, RO by image attachment, absolute orientation * 4. Complex solution, etape-solution, bundle adjustment * 5. Image triangulation, use, types * 6. Digital photogrammetry, digital image, principle, scanners, scanning, DPI, accuracy, data quantity * 7. Correlation technique, principle, utilization, automatic searching in raster image * 8. Digital orthophoto, types, interpolation, principle, algorithm, usage, problems * 9. Subpixel transformation * 10. Digital workstations, devices and processing systems * 11. Image transformations, Direct and Indirect methods, reasons to use * 12. Aerial laser scanning, utilization and products in the Czech Republic *13. RPAS methods (drones)	Z,ZK	5
155GEPL	Survey Sketches	Z	2
155GNSS	Applications of GNSS	ZK	4
155KANE	Cadastre of Real Estate History of land registration in the CR. Stable and land cadastre. Land registration and development of title registration. Subject and content of cadastre of real estates. Cadastral information system ISKN. Organisation of surveying agency. Administration and maintenance of cadastre - measurements, calculations, visualisation and documentation. Geometric plan. Setting-out of property boundaries. Legal relations to real estates, cadastral registration.	Z,ZK	6
155KGT	Space Ggeodesy T	ZK	4
155MSGA	System MicroStation in Geodetic Applications	Z	3
155PKNZ	Law in Cadastre and Surveying Legal and technical background of the Czech Cadastre, relation between cadastre and land books, cadastral law of 1927. Surveying and cadastral bodies. Basic surveying laws and regulations, special application of subjects. Forms of public rights, current in-force legal documents in suveying sector.	ZK	3
155PRGE	Project - Theoretical Ggeodesy	KZ	5
155TG3	Theoretical geodesy 3	Z,ZK	6
155TG4	Theoretical geodesy 4 Astronomical coordinate systems. Kepler's and disturbed motion of the satellites. Time learning. Precessions and nutation. Phenomena of the aberration type. Observation methods of cosmic geodesy. Geodetic satellites. Dynamic method of space geodesy. Space coordinate systems. Application to determine the Earth's gravity field parameters. Satellite Earth Observation Missions (CHAMP, GRACE, GOCE).	Z,ZK	5
155TPR	Probability and Statistics	KZ	2
155VFG	Photogrammetry -Project practical documentation of historical objects, technology of documentation and data processing by modern methods	KZ	5
155VGM	Field Training in Cadastre Works in minor horizontal control for renewal and administration od cadastre od real estate. Detailed planimetry and altimetry measurements, revision of cadastre, setting-out of property boundaries.	KZ	4
155YGG	Geophysics and geodynamics	Z,ZK	3
155ZTMG	Fundamentals of Theoretical Mechanics	Z	2

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

