Co-funded by the
Erasmus+ Programme
of the European Union

New and updated courses for Bachelor and Master of Science (BSc and MSc) programme (Geodesy - University of Belgrade - UB)

OBJECTIVES OF STUDY'S PROGRAMME OF GEODESY AND GEOINFORMATICS AT THE FACULTY OF CIVIL ENGINEERING - UNIVERSITY OF BELGRADE

Study programme Geodesy and Geoinformatics at the University of Belgrade is under the responsibility of the Faculty of Civil Engineering - Department of Geodesy and Geoinformatics which contributes to science and profession development in the field of geodesy and geoinformatics. Apart from that, being the leading institution of this kind at the territory of Serbia, the Department is also tasked with organization of research towards contributing general science development in this field. The Department of Geodesy and Geoinformatics is the parent department in the field of geodetic engineering, namely: Reference geodetic networks, Determination of Earth gravity, Survey and land territory management, Photogrammetry and remote sensing, Geodetic mapping, Land information systems, Geodetic metrology, Geodesy in engineering applications and Modelling and management in geodesy.

The Department of Geodesy and Geoinformatics exists since 1935 in various organizational forms at the Faculty of Civil Engineering. It organizes and provides education for studies of geodesy and geoinformatics at three levels of study – Undergraduate, Master and Doctoral. The Department has several laboratories at its disposal.

This curricula is completed with four new courses at MSc level being supported by this Erasmus+ project 561902-EPP-1-2015-1-SE-EPPKA2-CBHE-JP with title: "Modernizing geodesy education in Western Balkan with focus on competences and learning outcomes" (GEOWEB). These are: Global geopotential models, Precise GNSS point positioning, Laser scanning and Geovisualization. Except above-mentioned four new courses, more other current courses were modernized including acquisition of new modern geodetic equipment and new computer's tools and software that were supplied during this Erasmus+ project.

The Department of Geodesy and Geoinformatics has 30 full-time lecturers and associates. Apart from theoretical lecturing, practical training is being organized at special teaching polygons, along with professional internship in geodetic organizations throughout Serbia.

The first year enrolment for academic study programme covers 40 budget financed and 20 self-financing tuitions for students. When enrolling, rating is being determined upon high school grades and results on mathematics test. An academic year is divided into two semesters, each lasting 15 weeks.

PROCEDURES FOR ASSESSMENT OF STUDENTS' ACHIEVEMENT

Assessment of student's achievement on the base of the learning outcomes, skills and competences are to be in accordance with following scale defined by Law of High Education:

Local grade	Points	Grade	Definition
10 Excellent	91 - 100	A+	Only minor errors
9 Very good	81 - 90	A	Above the average standards but with some errors
8 Good	71 - 80	B	A number of notable errors
7 Satisfactory	61 - 70	C	With significant shortcomings
6. Adequate performance	55 - 60	D	Performance meets the minimum criteria
5 Unacceptable	Below 55	F	Fail – some more/ considerable further work required before the credit can be awarded

REGIME AND OBJECTIVE OF BACHELOR PROGRAMME OF GEODESY AND GEOINFORMATICS

The purpose of undergraduate programme is to introduce the students to the methodology of techniques and technologies for geodetic measurements, geospatial data acquisition methods, data processing and analysis techniques, using technical documentation and performing governmental and administrative tasks in the field of Real Estate Cadastre. The programme lasts for 3 years, providing the professional title: Geodetic Engineer.

COMPETENCES DESCRIPTION FOR A BACHELOR PROGRAMME IN GEODESY AND GEOINFORMATICS

After successful graduation of BSc level, the student will get the competences that will qualify him/her to:

- Use mathematical and physical concepts and theory of data processing, data modelling and principle of construction and work of comprehensive geodetic equipment and other types of sensors;
- Plan and realize field data measurements (or collection of space data) with proper procedures and appropriate geodetic equipment (sensors), process them using proper methods and visualize the data for different purposes in an computer readable environment (CAD, GIS,…);
- Work in a team and communicate effectively in oral and written form taking into account ethic relevant to geodetic profession.

Sem: 1	Year: 1			Sem: 2	Year: 1		
No.	Course Name	Course	ETCS	No.	Course Name	Course	ETCS
1	Math 1	C	10	1	Math 2	C	6
2	Fundamentals of Geosciences	C	2	2	Introduction to programming	C	5
3	Basics of Informatics	C	5	3	Theory of errors of geodetic measurements	C	5
4	Computational geometry	C	4	4	Techniques geodetic measurements	C	7
5	Technical Physics 1	C	5	5	Technical Physics 2	C	5
6	Principles of Economics	S	3	6	English - Foreign language	S	3
7	Fundamentals of Real and administrative law	S	3	7	English professional	S	3
	Total=		32		Total=		34
	BSc C =		26		BSc C =		28
	BSc S =		6		BSc S =		6

Sem: 3	Year: 2			Sem: 4	Year: 2		
No.	Course Name	Course	ETCS	No.	Course Name	Course	ETCS
1	Plane (geodetic) surveying 1	C	5	1	Plane (geodetic) surveying 2	C	4
2	Geoinformatics 1	C	5	2	Geoinformatics 2	C	5
3	Cartography 1	C	4	3	Cartography 2	C	5
4	Real Estate Cadastre 1	C	5	4	Plane surveying, field practice	C	4
5	Math 3	C	6	5	Theoretical Geodesy	C	3
6	Adjustment calculation 1	C	5	6	Urban and rural land development	C	4
				7	Photogrammetry and Remote Sensing 1	C	5
	Total=		30		Total=		30
	BSc C =		30		BSc C =		30
	BSc S =		0		BSc S =		0

Sem: 5	Year: 3			Sem: 6	Year: 3			
No.	Course Name	Course	ETCS	No.	Course Name	Course	ETCS	
1	Geodetic metrology	C	5	1	Engineering Geodesy 2	C	5	
2	Engineering Geodesy 1	C	5	2	Basics of management in geodesy	C	3	
3	Satellite geodesy	C	3	3	Engineering surveying, field practice	C	3	
4	Photogrammetry and Remote Sensing 1	C	5	4	Final work	C	9	
5	Geodesy in space and urban planning	S	5	5	Professional practice	C	2	
6	Fundamentals of Digital Image Processing	S	5	6	Gravimetry	S	5	
7	Global navigation satellite systems	S	3	7	Digital Terrain Modeling	S	5	
8	State geodetic surveying and regulations	S	3	8	Geodetic surveying, field practice	C	3	
9	Visualization and presentation of 3D models	S	4	9	Geodetic Metrology, Practical work	S	3	
10	Plane (geodetic) surveying 3	S	3	10	Geoinformatics, Practical work	S	3	
				11	Cartography, Practical work	S	3	
				12	Photogrametry, Practical work	S	3	
								Σ
	Total=		41		Total=		47	214
	BSc C =		18		BSc C =		25	157
	BSc S =		23		BSc S =		22	57

REGIME AND OBJECTIVE OF MASTER PROGRAMME OF GEODESY AND GEOINFORMATICS

The Master academic studies in geodesy have the objective to improve academic competences of the undergraduate students. Course structures at all modules involve specific fields of geodesy, being not only daily engineering practice – complex fields included, which require additional knowledge for comprehending and resolving. Duration of the Master academic studies is two years, with three modules available. Two of the modules are traditionally related to the field of geodesy – Geodesy and Geoinformatics, with separate module being introduced in 2008 – Land management. This module had been established within the separate European Union Tempus project. At the completion of Master studies, the Master thesis is being presented, and the graduate title is Master Engineer in Geodesy and Geoinformatics.

COMPETENCES DESCRIPTION FOR A MASTER PROGRAMME IN GEODESY AND GEOINFORMATICS

After successful graduation of MSc level, the student will get the competences that will qualify him/her to:

- Recognize and apply the different methods of solving the problems (Geodetic, Geoinformatics, Land management) with the capability to use the appropriate ones in accordance with the prerequisite of the consumer needs,
- Design the project documentation with the methodology that appreciate professional standards, legal conditions and considerable ethic,
- Process and analyze space data collected, assess the data quality, synthesize the work of various professionals and visualize them in accordance to the professional standards, and
- Communicate with the consumers in an efficient way satisfying the expected market needs and lead the teamwork to realize the project (Geodesy, Geoinformatics, Land management) successfully.

MSc at UB FCE (modul Geodesy)

Sem: 1	**Year: 1**			**Sem: 2**	**Year: 1**			
No.	**Course Name**	**Course**	**ETCS**	**No.**	**Course Name**	**Course**	**ETCS**	
1	Geodetic astronomy	C	5	1	Geodetic reference network	C	5	
2	Digital Signal Processing	C	6	2	Deformation analysis	C	5	
3	Surveying optimization	C	5	3	Project methodology in geodesy	C	5	
4	Adjustment calculation - advanced	C	5	4	Field practice	C	3	
5	The theory of satellite positioning	C	5	5	Design of geodetic works in engineering	C	5	
6	Electronics in Geodesy	S	6	6	Physical Geodesy	C	5	
7	Mechanics in geodesy	S	6					
	Total=		**38**		**Total=**		**28**	
	BSc C =		**26**		**BSc C =**		**28**	
	BSc S =		**12**		**BSc S =**		**0**	
Sem: 3	**Year: 2**			**Sem: 4**	**Year: 2**			
No.	**Course Name**	**Course**	**ETCS**	**No.**	**Course Name**	**Course**	**ETCS**	
1	Time series analysis	S	5	1	Master thesys	C	20	
2	Engineering Surveying in industry	S	5	2	Practice	C	2	
3	Surveying in information system engineering facilities formation	S	5	3	Research work on the preparation of the master thesis	C	10	
4	Engineering photogrammetry	S	5					
5	Measuring methods of physical geodesy	S	5					
6	Modeling objects in 3D space	S	5					
7	Quality assurance of geodetic measurements	S	5					
8	Project Management in geodesy	S	5					
9	Astrometric methods	S	6					
10	Geodetic geodynamics	S	6					
11	Geodetic reference systems	S	6					
12	Numerical methods of physical geodesy	S	6					
13	Object-Oriented Programming	S	6					
14	Satellite and inertial navigation	S	6					
15	Terrestrial Laser Scanning in Engineering	S	6					
16	The project in geodesy	S	6					
17	The project in plane surveying	S	6					
18	The project in engineering surveying	S	6					
19	**Global geopotential models (GGM) ***	**S**	**5**					
20	**Precise GNSS point positioning ***	**S**	**6**					
								Σ
	Total=		**111**		**Total=**		**32**	**209**
	BSc C =		**0**		**BSc C =**		**32**	**86**
	BSc S =		**111**		**BSc S =**		**0**	**123**

*** New courses**

This report reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

MSc at UB FCE (modul Geoinformatics)								
Sem: 1	**Year: 1**			**Sem: 2**	**Year: 1**			
No.	**Course Name**	**Course**	**ETCS**	**No.**	**Course Name**	**Course**	**ETCS**	
1	GIS	C	7	1	Digital photogrammetry	C	6	
2	Object oriented programming	C	6	2	IT in Cartography	C	5	
3	Digital signal processing	S	6	3	Real Estate cadastre 2	C	5	
4	Electronic in geodesy	S	6	4	Methodology of project design in geodesy	C	5	
5	Theory of satellite positioning	S	5	5	GIS designing	C	5	
6	Physical framework of Remote Sensing	S	5	6	Web programming	S	5	
7	Digital signal processing	S	5	7	Databases Advanced	S	5	
8	Engineering Photogrametry	S	5	8	Map projections	S	5	
				9	LBS	S	5	
				10	**Laser Scanning ***	**S**	**5**	
				11	**Geovizualization ***	**S**	**5**	
	Total=		**45**		**Total=**		**56**	
	BSc C =		**13**		**BSc C =**		**26**	
	BSc S =		**32**		**BSc S =**		**30**	
Sem: 3	**Year: 2**			**Sem: 4**	**Year: 2**			
No.	**Course Name**	**Course**	**ETCS**	**No.**	**Course Name**	**Course**	**ETCS**	
1	GIS programming	C	3	1	Master thesys	C	20	
2	Remote Sensing	C	5	2	Practice	C	2	
3	State Cartography	C	5	3	Research work on the preparation of the master thesis	C	10	
4	Web GIS	S	5					
5	Web Cartography	S	5					
6	Land consolidation Advanced	S	5					
7	Geodesy in Space Planning	S	5					
8	Geostatistics	S	5					
9	Programming in PL/SQL	S	5					
10	Land Valuation	S	5					
11	Project in Cartography	S	5					
12	Project in Photogrametry	S	5					
								Σ
	Total=		**58**		**Total=**		**32**	**191**
	BSc C =		**13**		**BSc C =**		**32**	**84**
	BSc S =		**45**		**BSc S =**		**0**	**107**
*** New courses**								

MSc at UB FCE (modul Land Management)								
Sem: 1	**Year: 1**			**Sem: 2**	**Year: 1**			
No.	**Course Name**	**Course**	**ETCS**	**No.**	**Course Name**	**Course**	**ETCS**	
1	Property market	C	5	1	Real Estate Investment Analysis	C	5	
2	GIS	C	7	2	Real Estate Cadastre 2	C	5	
3	Law in space planning and environmental protection	C	6	3	Land Consolidation basic	C	5	
4	Law in Land Management	C	7	4	Methodology of project design in geodesy	C	5	
5	Geostatistics	S	5	5	Urban Land Planning	C	5	
6	Environmental protection	S	5	6	IT in Cartography	S	5	
				7	Negotiation and Communication	S	5	
				8	**Geovizualization ***	**S**	**5**	
	Total=		**35**		**Total=**		**40**	
	BSc C =		**25**		**BSc C =**		**25**	
	BSc S =		**10**		**BSc S =**		**15**	
Sem: 3	**Year: 2**			**Sem: 4**	**Year: 2**			
No.	**Course Name**	**Course**	**ETCS**	**No.**	**Course Name**	**Course**	**ETCS**	
1	Land Consolidation Advanced	C	5	1	Master thesys	C	20	
2	Land Valuation	C	5	2	Practice	C	2	
3	Web GIS	S	5	3	Research work on the preparation of the master thesis	C	10	
4	Remote Sensing	S	5					
5	Project Management in geodesy	S	5					
6	Geodesy in space planning	S	5					
7	Infrastructure	S	5					
8	Natuarl Resorces	S	5					
9	Urban geodesy project	S	3					
10	Real Estate Project	S	3					
								Σ
	Total=		**46**		**Total=**		**32**	**153**
	BSc C =		**10**		**BSc C =**		**32**	**92**
	BSc S =		**36**		**BSc S =**		**0**	**61**
*** New courses**								

Course name	Global geopotential models (GGM)
ECTS credits	Lectures: 2 Practice/exercise: 1 Project: 2 **Total: 5**
Lecturer	Oleg Odalovic
Study hours	Lectures: 30 Practice/exercise: 30 Project: 60 **Total: 120**
Learning outcomes	After completing the course, students will be able to: • Describe Boundary Value Problem. • Explain Spherical Harmonics. • Interpret methods for determination of coefficients of GGM. • Apply GGM in order to determine anomaly (disturbing) potential and their functionals. • Design model of geoid or quasigeoid by Remove-Compute-Restore Techniques by applying collocation and Fast Fourier Transformation (FFT) • Analyse two approaches of geoid or quasigeoid modelling
Syllabus (List of lessons)	1. Boundary value problem (BVP). Dirichlet's problem. 2. Solution of BVP by means of spherical harmonics. 3. Zonal harmonics. Tesseral harmonics. Sectorial harmonics. Surface harmonics. 4. Satellite orbits and spherical harmonics. 5. Determination of geopotential coefficient by terrestrial measurement. 6. Determination of geopotential coefficient by satellite measurement. 7. Determination of geopotential coefficient by combination of terrestrial and satellite measurement. 8. Other BVP of potential theory (Neumann's problem, third boundary value problem,…) 9. Global Geopotential Models (GGM). 10. Dedicated satellite missions. 11. Determination of free air anomaly by GGM. 12. Determination of height anomaly by GGM. 13. Use of GGM in the process of determining the geoid by Remove-Compute-Restore method. Combination of GGM, gravity measurements and Digital Terrain models. 14. Degree Variances and Error Degree Variances and their usages. 15. Tailoring of GGM
Prerequisite	Physical geodesy. Numerical Methods of Physical Geodesy.
Course literature	1. Vaniček P., Krakivsky E., Geodesy, Concepts, ELSEVIER SCIENCE PUBLISHERS B.V. P.O. BOX 1991. 100 BZ AMSTERDAM THE NETHERLANDS. 2. H. Moritz, Advanced Physical Geodesy, HERBERT WICHMANN VERLAG KARLSRUHE ABACUS PRESS ABACUS PRESS TUNBRIDGE WELLS KENT 1980 3. Heiskanen Weiko H. Moritz, Physical geodesy, Springer, 2006. 4. Torge W., Gravimetry, Walter de Gruyter, Berlin-New York, 1989. 5. Mathematical and Numerical Techniques in Physical Geodesy Lectures delivered at the Fourth International Summer School in the Mountains on Mathematical and Numerical Techniques in Physical Geodesy Admont, Austria, August 25 to September 5, 1986 6. Nikolaos Pavlis, Modeling and Estimation of a Low Degree Geopotential Model From Terrestrial Gravity Data, Report No. 386, Department of Geodetic Science and Surveying, The Ohio State University, Columnus, Ohio, March 1988. 7. Jekeli, C., 2012: Geometric Reference Systems in Geodesy. Ohio State University, 209 pages.

Course name	Precise GNSS Point Positioning
ECTS credits	Lectures: 6 Practice/exercise: 0 Project: 0 **Total: 6**
Lecturer	Dragan Blagojevic
Study hours	Lectures: 30 Practice/exercise: 0 Project: 0 **Total: 30**
Learning outcomes	After completing the course, students will be able to: • Define PPP model, • Explain the impact of various error sources on PPP, • Interpret the problems in combined use of different satellite systems, • Analyse the accuracy in static and kinematic geodetic applications.
Syllabus (List of lessons)	1. GNSS architecture: space segment, control segment, user segment 2. Principle of GNSS positioning. Satellite navigation systems: GPS, GLONASS, GALILEO, BEIDOU, QZSS. 3. Functional PPP model: classic model, UoC model 4. Modelling of geometric range. Correction due to Earth rotation. Basic stochastic model. 5. Satellite error sources: satellite ephemeris and clocks, satellite orientation, antenna phase center, differential code biases 6. Receiver error sources: receiver clock, antenna phase center, differential code biases, cycle slips. 7. Environmental error sources: troposphere delay, ionosphere delay, multipath. 8. Tidal and loading error sources: earth body tide, ocean tide loading, atmospheric pressure loading. 9. Other error sources: relativistic effects, phase windup. 10. Least squares method. Kalman filter. The state vector. Calculating the expected observations. Design matrix. 11. Observation stochastic modeling. Parameter stochastic modeling. 12. Quality control and outlier detection. Feasibility of PPP. 13. Static and kinematic positioning, possibilities and accuracy. 14. Atmospheric research, weather forecast, ionospheric studies. 15. Time transfer.
Prerequisite	No
Course literature	1. Grewal, M. S., and Andrews, A. P.:Kalman Filtering: Theory and Practice Using MATLAB. John Wiley & Sons, Inc., 2nd ed., 2001. 2. Seeber, G.: Satelliten geodaesie, Grundlagen, Methoden und Anwendungen. Walter de Gruyter, Berlin, New York, 1989. 3. Hofmann-Wellenhof, B., Lichtenegger, H., and Wasle, E.:GNSS — Global Navigation Satellite Systems: GPS, GLONASS, Galileo, and more. Wien: Springer, 2008. 4. Leick, A.:GPS satellite surveying. John Wiley & Sons, 3 ed., 2004

Course name	Laser Scanning
ECTS credits	Lectures: 3 Practice/exercise: 2 Project: **Total: 5**
Lecturer	Zeljko Cvijetinovic, Nenad Brodic
Study hours	Lectures: 75 Practice/exercise: 50 Project: **Total: 125**
Learning outcomes	After completing the course, students will be able to: • Define remote sensing concepts with a focus on light detection and ranging (LiDAR) technology. • Describe laser scanning measurement procedure, data management, processing and modeling; • Explain principles of terrestrial, airborne and mobile laser scanning; • Operate point clouds taken from different positions; • Georeference, segment and classify the point clouds; • Fit geometrical primitives to point cloud; • Create digital terrain models and urban models from laser scanning data; • Map the images (textures) onto point cloud; • Evaluate the applications of laser scanning in forestry, engineering and for cultural heritage.
Syllabus (List of lessons)	1. Basic measurement principles and components of laser scanners. 2. Airborne laser scanning (basics, ALS systems, operational aspects). 3. Terrestrial laser scanning (basics, terrestrial laser scanners, operational aspects). 4. Mobile mapping. 5. System calibration. 6. Basics of LiDAR data processing and management. 7. Point cloud structuring and visualisation. 8. Registration and georeferencing of point clouds. 9. Point cloud data formats and software tools. 10. Accuracy, quality assurance and quality control of LiDAR data. 11. Filtering of point clouds and DTM generation. 12. Feature extraction from LiDAR data (roads, buildings, vegetation, etc.). 13. Integration with other sensors. 14. Laser scanning applications (forestry, engineering, cultural heritage, etc.).
Prerequisite	No
Course literature	1. Vosselman, G. and Maas, H.-G.:Airborne and Terrestrial Laser Scanning, CRC Press - Taylor and Francis Group, 2010. 2. Shan J. and Toth. C.:Topographic LaserRangingAnd Scanning: Principles and Processing, CRC Press - Taylor and Francis Group, 2008. 3. Kraus, K.: Photogrammetry: Geometry from Images and Laser Scans, Walter de Gruyter, 2007.

<table>
<tr><th>Course name</th><th>Geovisualization</th></tr>
<tr><td>ECTS credits</td><td>Lectures: 3
Practice/exercise: 2
Project:
Total: 5</td></tr>
<tr><td>Lecturer</td><td>Milan Kilibarda, Dragutin Protic</td></tr>
<tr><td>Study hours</td><td>Lectures: 75
Practice/exercise: 50
Project:
Total: 125</td></tr>
<tr><td>Learning outcomes</td><td>After completing the course, students will be able to:
• Recognize the principles of cartography,
• Explain the visualization techniques,
• Visualize the geographic data both spatial and spatial-temporal in 2D and 3D space,
• Use modern technologies for map creation and dissemination,
• Practice a variety of thematic mapping and geovisualization techniques.</td></tr>
<tr><td>Syllabus (List of lessons)</td><td>1. Cartographic fundamentals.
2. Visual variables: spacing, size, orientation, shape, arrangement, height, hue, value, saturation.
3. Mapping discrete features.
4. Treatment of continuous surfaces.
5. Introduction to thematic mapping.
6. Statistical mapping.
7. Space-time visualization and 3D visualization
8. Introduction to multimedia and web cartography.
9. Data models and data formats; Model based visualization
10. Standardization and formats KML, VRML, GEOVRML, CITYGML; WEBGL, glTF
11. Cartographic visualization for Web, SLD ;
12. Virtual globes.
13. Virtual reality - VR and augmented reality - AR
14. Smart cities.
15. Map mashups.
16. Volunteered geographical information.</td></tr>
<tr><td>Prerequisite</td><td>No</td></tr>
<tr><td>Course literature</td><td>1. Kraak, M. J., & Ormeling, F. (2011). Cartography: visualization of spatial data. Guilford Press.
2. Slocum TA, McMaster RB, Kessler FC & Howard HH (2009) Thematic Cartography and Geovisualization, 3rd edition. Pearson / Prentice-Hall.
3. MacEachren, A.M, Taylor, D.R.F.: Visualization in modern cartography, Volume 2, 1st Edition</td></tr>
</table>

<u>Updated courses/New Lab equipment</u> were included in the course excersizes, field practice and practical work

No	BSc courses	Sem	No	MSc courses	Sem
1.	Techniques of geodetic measurements	2	1.	Geodetic reference network	2
2.	Plane surveying, Field practice	4	2.	Field practice (geodesy)	2
3.	Global navigation satellite systems	5	3.	Engineering surveying in industry	3
4.	Plane (geodetic) surveying 3	5	4.	Engineering photogrammetry	3
5.	Engineering surveying, Field practice	6	5.	Quality assurance of geodetic measurements	3
6.	Geoinformatics, Practical work	6	6.	Digital photogrametry	2
7.	Photogrametry, Practical work	6	7.	Project in Photogrametry	3
			8.	Project in Geoinformatics	3

<u>List of new teaching materials</u>

No.	Preliminary title of the new teaching material	Responsible teacher	Type of the teaching material (textbook, exercise manual, instruction, etc)	Reviewer
1	Geovizualization	Milan Kilibarda, Dragutin Protic PhD	Textbook	Zeljko Cvijetinovic, PhD
2	Precise GNSS Point Positioning	Dragan Blagojevic, PhD	Textbook	Oleg Odalovic, PhD
3	Global geopotential models	Oleg Odalovic, PhD	Textbook	Dragan Blagojevic, PhD
4	Laser scanning	Zeljko Cvijetinovic, Nenad Brodic PhD	Lessons	Dragan Mihajlovic, PhD
5	Research methodology and communication	Branko Bozic, PhD	Textbook	Branislav Bajat, PhD

Local coordinator
Prof. dr Branko Bozic