UNIVERSITY OF PRISHTINA
“HASAN PRISHTINA”

FACULTY OF CIVIL ENGINEERING

DEPARTMENT GEODESY – MSc.

2019 – 2022

Study Program: MSc in Geodesy

First year						
First semester			**Hours/ Week**			
No.	**O/E**	**Subject**	**L**	**E**	**ECTS**	**Professor**
1	O	Geodetic reference systems	2	2	6	Prof.asoc.dr. Perparim Ameti
2	O	Geospatial databases and data integration	2	2	6	Prof.ass.dr. Ismail Kabashi
3	O	Geovisualization	2	2	6	Prof.ass.dr. Bashkim Idrizi
4	O	Spatial data infrastructure	2	2	6	Dr. Ymer Kuka
		Total	**8**	**6**	**24**	
No.	**E**	**Subject**	**L**	**E**	**ECTS**	**Professor**
1	E	Applied mathematics	2	2	6	Prof. dr. Abdullah Zejnullahu
2	E	Foreign language	2	0	3	Nedime Belegu
3	E	Advanced digital photogrametry	2	1	3	Prof.dr. Murat Meha
		Total	**6**	**3**	**12**	
		Total 21+9 =30 ECTS				
Second semester			**Hours/ Week**			
No.	**O/E**	**Subject**	**L**	**E**	**ECTS**	**Professor**
1	O	Global Navigation Satellite Systems (GNSS)	2	2	6	Prof.asoc.dr. Perparim Ameti
2	O	Advanced theory of errors	2	2	6	Prof.dr. Murat Meha
3	O	Geoinformation Science & Spatial analysis	2	2	6	Prof.ass.dr. Bashkim Idrizi
4	O	Cadastre Information Systems	2	0	3	Prof.dr. Murat Meha
		Total	**8**	**6**	**21**	
No.	**E**	**Subject**	**L**	**U**	**ECTS**	**Professor**
1	E	Land market economy	2	2	6	Dr. Ymer Kuka
2	E	GIS in environment	2	1	3	Prof.asoc.dr. Perparim Ameti
3	E	Virtual Cartographic Modeling	2	2	6	Prof.ass.dr. Bashkim Idrizi
		Total	**6**	**5**	**15**	
		Total 21+9=30ECTS				
Second year						
Third semester			**Hours/ Week**			
No.	**O**	**Subject**	**L**	**E**	**ECTS**	**Professor**
1	O	Physical geodesy and tectonic	2	2	6	Prof.ass.dr. Florim Graiqevci
2	O	Advanced Image Processing and RS	2	2	6	Prof.ass.dr. Bashkim Idrizi

3	O	Engineering surveying (mine included)	2	2	6	Prof.ass.dr. Ismail Kabashi
4	O	GIS project management	2	0	3	Dr. Ymer Kuka
		Total	**8**	**6**	**21**	
No.	**E**	**Subject**	**L**	**E**	**ECTS**	**Professor**
1	E	Web GIS	2	2	6	Prof.asoc.dr. Perparim Ameti
2	E	Agriculture Information Systems	2	0	3	Prof.asoc.dr. Perparim Ameti
3	E	Spatial decision support systems	2	0	3	Dr. Ymer Kuka
		Total	**6**	**2**	**12**	
		Total21+9=30 ECTS				
Fourth semester						
1		Diploma Thesis			30	
		Total			**30**	

Course title:	**Geodetic Reference Systems**
Rationale and description of the course:	This course begins with basic knowledge on geodetic reference systems, and it continues with determination and establishment of International Terrestrial Reference Systems and Frames, global coordinate systems and referent ellipsoid, coordinate transformation. The course will end with reference surfaces of heights and variations and geodynamic of geodetic reference frames.
Course Goals:	To achieve theoretical and practical knowledge in definition of ITRS and ITRS.
Expected Learning Outcomes:	After completing this module, a student should: - understand the definition and realization of geodetic reference systems and frames, in particular global systems realized by modern space methods - be familiar with existing geodetic reference frames used in Kosovo, Western Balkan and internationally - be able to transform between different types of geodetic refernce frames
Teaching Methods:	- *Lecture* - *Discussion during lectures*

	- *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	1) Torge, W.: Geodesy, 3rd Edition, Walter de Gruyter, 2001. 2) Seber, G.: Satellite Geodesy, 2nd Edition, Walter de Gruyter, 2003
Additional Literature:	Skuka Q.: Gjeodezia e Larte, Libër Universitar, 2008, Tirane

Course title:	**Geospatial databases and data integrations**
Rationale and description of the course:	Geospatial databases and data integration is a very important course. GIS systems have an important role in almost every sector of society and all GIS systems are depended on the databases.
Course Goals:	This course is focused in the design and development of geospatial databases. Importance role will be focused on the modeling techniques.
Expected Learning Outcomes:	- Understand the general principles of data modeling - Establish object-based and field-based views of the world - Understand the fundamentals of representing spatial information in discrete structures

	- Know principles, foundations and basic techniques of Land surveying, Global Navigation Satellite Systems, Photogrammetry and remote sensing - Understand approaches to and characteristics of secondary data acquisition - Be able to compare acquisition methods and decide which method to apply - Be able to establish processing workflows, assess accuracy results and applicability for tasks
Teaching Methods:	- Lecture - Discussion during lectures - Exercises - Work in group
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First valuation: 25% Second Valuation: 25% Homework: 10% Attendance: 10% Final Exam: 30% Total: 100%
Primary Literature:	1) M. Zeiler (2001): Modeling our world: The ESRI Guide to Geodatabase Design, ESRI Press 2) P. Rigaux, M. Scholl and A. Voisard (2002): Spatial Databases with applications to GIS, Morgan Kaufmann

	3) S. Shekhar and S. Chawla (2003): Spatial Databases: A Tour, Prentice Hall
Additional Literature:	1) C.D. Ghilani and P.R. Wolf (2008): Elementary Surveying: An Introduction to Geomatics: International Edition, Prentice Hall 2) J. R. Jensen (2007): Remote Sensing of the 3) Environment: An Earth Resource Perspective, Prentice-Hall

Course title:	**Geovisualization**
Rationale and description of the course:	Geovisualization is oriented mainly in topographic symbols and graphic variables: size, colors, Toponyms, orientation, models; Topographic and thematic map design and symbolisation; Map design for presentation, synthesis, analysis and exploration of spatial data; Exploratory data analysis, graphical data analysis techniques 2D, 2.5D, 3D and 4D graphics and its representation; Virtual models; Cartography on internet, publication alternatives for distribution of electronic atlases; Programming, scripting and automation for visualization and publishing electronic atlases
Course Goals:	The basic objective of this course are teaching cartographic principles and techniques Effective visualization of spatial data. Upon completion of this course students will be able to design cartographic products manual and digital using existing geographical systems, will also catch the level of development in critical thinking-essential in creating geographic products.
Expected Learning Outcomes:	After completing this course students should be able : - having knowledge of cartographic symbols and classification data, - Visual variables: spacing, size, orientation, shape, , arrangement, height, hue, value, saturation - Topographic and thematic map design and symbolization - Map design for presentation, synthesis, analysis and exploration of spatial data.

	- Exploratory data analysis, graphical data analysis techniques
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First valuation: 25% Second Valuation: 25% Homework: 10% Attendance: 10% Final Exam: 30% Total: 100% %
Primary Literature:	1. Terry, B. Robert, Thematic Cartography and Geovisualization, 3rd edition, 2008 2. M.-J. Kraak & F. Ormeling, Cartography – Visualization of Geospatial Data, Prentice Hall, 2nd edition, 2003
Additional Literature:	1. D. Jason, A. Maceachren, M. Jan Krak: Exploring Geovisualization, 2005 2. Idrizi B.: Hartografia e përgjithshme dhe përgjithësimi hartografik. 2006.

Course title:	**Spatial Data Infrastructure**
Rationale and description of the course:	In this course, students will explore theoretical and practical concepts of Spatial Data Infrastructures (SDIs). They will study fundamental concepts of SDI and the important factors that affect the development of SDI. Furthermore, techniques for design, implementation, management, and

	evaluation of SDIs will be explored. This course also includes practical and theoretical exercises relevant to current status of spatial data management and sharing, development of clearinghouse networks, SDI evaluation, and spatially enabled-society.
Course Goals:	The aim of the course is that students should have acquired on completion of the course the following knowledge and skills: Knowledge and understanding
Expected Learning Outcomes:	After completion of this course, students should be able to do as following: - Describe the importance of spatial data for planning, decision making and sustainable development - Describe the current status/the problems for spatial data in terms as availability, accessibility, applicability and usability - Describe the general the concepts and the aims for Spatial Data Infrastructure and the importance of data exchange - In detail, explain and understand the main components of a SDI
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	Masser, I. (2007). Building European SDI, ESRI Press

Additional Literature:	1. Crompvoets, J., Rajabifard, A.,Bregt, A., Williamson, I. (2004). Assessing the world wide developments of national spatial data clearinghouses, International Journal of Geographical Information Sciences, 18, 1-25. 2. Toomanian, A., Mansourian, A., Harrie, L., Ryden, A. (2011). Using Balanced Scorecard for Evaluation of Spatial Data Infrastructures: a Swedish Case Study in accordance with INSPIRE, International Journal of Spatial Data Infrastructures Research, 6, 311- 343 3. Williamson I.P., Rajabifard, A. and Feeney, M. E. F. (2003). Developing Spatial Data Infrastructure: from concept to reality, London & New York: Taylor & Francis.

Course title:	**Applied Mathematics**
Rationale and description of the course:	This course serves students for the acquisition of different mathematical models and their solution by numerical methods and the study of different phenomena in geodesy with different mathematical methods. Within this subject the following will be addressed: Equations with a variable and different methods for their numerical solution; Interpolation and Approximation; Numerical Derivative, Numerical Integration; Numerical linear algebra; Direct and indirect methods for solving systems of linear equations; Applicable statistics.
Course Goals:	To achieve theoretical and practical knowledge in applied mathematics.
Expected Learning Outcomes:	Students should be able to demonstrate that they can: - apply their knowledge of relevant mathematical techniques in a variety of contexts; - construct rigorous mathematical arguments through an appropriate use of precise statements, logical deduction and by manipulation of mathematical expressions; - evaluate mathematical models, including an appreciation of the assumptions made, and interpret, justify and present the results from a mathematical analysis in a form relevant to the original problem;

	- Communicate mathematical ideas and methods, including the use of appropriate mathematical notation, terminology, conventions and diagrams, in a clear, logical and well-structured presentation.
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	1) Margarita Qirko, Syti Hysko : Analiza Numerike, 2004, Tirane 2) Abdullah Zejnullahu, Fevzi Berisha : Matematika III, 1997, Prishtine 3) Applied Mathematics by Logan, J. David, 2013
Additional Literature:	Richard L. Burden, J. Douglas Faires : Numerical Analysis, 1997, ITP

Course title:	**Foreign Language**

Rationale and description of the course:	Introduction to Technical English Language course. Engineering construction as a profession. Reasons for choosing engineering as a profession. The main principles of building materials. Creating modern structures. Environmental Engineering. Bridges and tunnels. High buildings. Compilation of sentences using technical vocabulary.
Course Goals:	The goal of this course is to - Improve reading, writing, listening and speaking skills of the students. - Increase students' abilities to communicate in English, both in writing and in speaking. - Enrich students' vocabulary by independent reading and listening in English language. - Students should acquire knowledge in grammar by learning and practicing it in the given context. - Enrich students' vocabulary with technical jargon by using written, transcribed and commented words in English language and the same translated in Albanian.
Expected Learning Outcomes:	- Increases the student's skills of reading, writing, listening and oral communication. - To increase student's skills of communication in oral and written English. - To enrich their vocabulary by reading and listening to the English language. - To acquire knowledge in grammar by learning and practice the grammar in context.
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*

Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	New Headway Advanced Student's Book (2007). Oxford University Press. Oxford UK. Oxford Dictionary. Oxford University Press. Oxford UK.
Additional Literature:	Research the Internet to written materials and professional brochures magazine. Electronic dictionaries and writting with professional terminology.

Course title:	**Advanced digital photogrammetry**
Rationale and description of the course:	Advanced stereoscopic imaging and epipolar geometry; Bundle block adjustment of photogrammetric blocks; Matching techniques (Interest operators, least squares image; matching, area and feature based matching); Digital Terrain Model (DTM) extraction; Orthoimage and orthomosaic production; Accuracy assessment of photogrammetric projects and products; Visualization of photogrammetric products
Course Goals:	Main goal of this course is to achieve knowledge on satisfied techniques which are currently applied in digital photogrammetry.
Expected Learning Outcomes:	After this course, students will be able to understand sophisticated techniques for extracting reliable information from imaging that cover each other in photogrammetric project.

Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	*1) MichelKasser, YvesEgels, DigitalPhotogrammetry, by Taylor&Francis,* *2) Fotogrametria, KarlKraus (translated in albanianNamik Kopliku), 2011*
Additional Literature:	www.wikipedia.com

Course title:	**Global Navigation Satellite Systems**
Rationale and description of the course:	This course begins with basic knowledge on history of satellite geodesy, calculation of satellite orbits, satellite positioning, then continues with systems, observations and calculations, statistical concepts including filtering and smoothing Kalman, application of GNSS. This course will end with other systems of satellite geodesy.
Course Goals:	To achieve theoretical and practical knowledge in global navigation satellite systems: GPS, GLONASS, GALILEO.

Expected Learning Outcomes:	After the course, students will be able to: - describe the principle of satellite positioning methods, the main components in a satellite navigation system and their functions - account for and analyse the influence of different error sources on the positioning precision - plan, perform and process precise GNSS measurements - identify proper instruments, measurement and processing methods for different applications
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	1) Sjöberg, LE (2009) Theory of satellite geodesy, KTH 2) Hofmann-Wellenhof, et al. (2008): GNSS, Springe
Additional Literature:	Isufi, E.: Sistemi i Pozicionimit Global - GPS, 2006.

Course Title:	**Advanced Theory of Errors**
Rationale and description of the course:	Theory of errors and least squares adjustment is an important subject within the geomatics program offered at KTH. This is due to the fact that surveying and mapping (or production of spatial data) often requires mathematical processing of measurement data. Furthermore, the general methodology of spatial data processing is essentially the same as that for data processing in other science and engineering fields, even though data collection procedures and data types can be different. Theory of errors is related and comparable with what is called estimation theory used in automatic control and signal processing.
Course Objectives:	The course aims to teach in advanced level of Theory of Errors and methods.
Learning Outcomes:	After completing the course the student should: - Define the relation between measurements and errors in all surveying processes. - Discuss reasons why the theory of errors is necessary, before the recognition of the final results from the geodetic measurements, - Recognize problems and define the adjustment method, - Be able to simulate and compare adjustment methods, - Be able to evaluate results and define the residuals, - Support effectively decisions of the final results
The actuality and the importance of the course:	The actuality and the importance of the course Advanced Theory of Errors within the equalizations in geodesy represents and assures high level of geodetic measuring accuracy.
Teaching Methodology:	- *Lecture* - *Discussion during lectures* - *Exercises*

	- *Work in group*
Evaluation Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First valuation: 25% Second Valuation: 25% Homework: 10% Attendance: 10% Final Exam: 30% Total: 100%
Basic Literature:	*1) K. T. Chang: Introduction to Geographic Information Systems, Mc Graw-Hill International Edition, 6th Edition, 2011, p. 432* *2) M. de Smith - P. Longley - M. Goodchild: Geospatial Analysis - A comprehensive guide, Winchelsea Press, 4th Edition, 2012, p. 34*
Additional Literature:	P. Longley et al.: Geographic Information Systems and Science, 2nd Edition, John Wiley & Sons Ltd., 2005. p. 517

Course title:	**Geoinformation Science and Spatial Analysis**
Rationale and description of the course:	Geoinformation Science and spatial analysis is a course of high importance. During this course the students have the opportunity to gain knowledge about GIS and its practical implementation in society problem solving.
Course Goals:	This course aims to teach higher levels of geoinformation science.
Expected Learning Outcomes:	- Be familiar with key GI concepts and terms - Identify major components of GIS from both technical organizational point of view - Apply spatial operators, e.g. describing feature shapes as well as spatial patterns, finding a shortest path, model visibility, apply

	interpolation and explain the differences, advantages and disadvantages between alternative techniques - Recognize problems in using spatial operations - Use geostatistical techniques to solve practical problems - Be able to simulate of spatial processes - Explain benefits of integrating spatial information into general ICT - Be able to evaluate results of data analysis, criticize data the process, and defend the conclusion - Discuss reasons why spatial information provides added value - Define typical GIS applications - Support effectively spatial decision process
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First valuation: 25% Second Valuation: 25% Homework: 10% Attendance: 10% Final Exam: 30% Total: 100%

Primary Literature:	1. K. T. Chang: Introduction to Geographic Information Systems, Mc Graw-Hill International Edition, 6th Edition, 2011, p. 432 2. M. de Smith - P. Longley - M. Goodchild: Geospatial Analysis - A comprehensive guide, Winchelsea Press, 4th Edition, 2012, p. 348
Additional Literature:	1. P. Longley et al.: Geographic Information Systems and Science, 2nd Edition, John Wiley & Sons Ltd., 2005. p. 517

Course Title:	**Cadastral Information Systems**
Rationale and description of the course:	This course is focused on the concepts of cadastral information systems, definitions and main components of the cadastral systems including (Hardware and Software).
Course Objectives:	This course aims to offer knowledge about Cadastral Information Systems and applied methods.
Learning Outcomes:	- Be familiar with the concept of cadastral Information system. - Identify major components of cadastral Information. - Understanding the aspects of Multipurpose Cadastral information. - Explain the responsibilities of Public and Private Sectors to the cadastral Information - Explain correlation between cadastral and spatial data information. - Be able to evaluate and defend technology for Cadastre Information system, - Be able to define the relation between GIS applications technical science and cadastral information, Support effectively decisions based on cadastral Information System,
The actuality and the importance of the course:	This course will help new experts of the cadastre to understand how cadastral systems work in different countries and by knowing this they will be able to propose the needed changes within our cadastral system.

Teaching Methodology:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Evaluation Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First valuation: 25% Second Valuation: 25% Homework: 10% Attendance: 10% Final Exam: 30% Total: 100%
Basic Literature:	1. J. Kaufmann, D. Steudler. CADASTRE 2014 – A Vision for a Future Cadastral System. of FIG Commission 7. July 1998, p 102, eng. and alb.
Additional Literature:	2. Larsson, G. Land Registration and Cadastral Systems: Tools for land information and management. Longman Scientific and Technical, Essex

Course title:	**Land Market Economy**
Rationale and description of the course:	The Supply of Land; The Demand for Land and Land Related Resources; Land Resource Requirements; The Economic Framework of Land Use; The Institutional Framework of Land Use; Property Rights in Land and the Legal Dimension; Public Policy Controls over Land Use; Land Resource Policy

Course Goals:	To achieve theoretical and practical knowledge regarding to land market economy
Expected Learning Outcomes:	- To provide an overview of the theoretical principles, policy instruments, and current practice of using economics in understanding land markets. - To understand the market system, the externalities causing market failure, and the mechanisms to correct for externalities. - To apply economic tools for evaluating land-use policies.
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. The evaluation will be as follows: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 10% Attendance 10% Final Exam 60% Total 100%
Primary Literature:	1. G. Beaur, P. R Schofield, J.M. Chevet, M.T. Perez-Picazo: Property Rights, Land Markets and Economic Growth in the European Countryside, 2013 2. S.V. Lall, M. Freire, B. Yuen, R. Rajack, J.J. Helluin: Urban Land Markets, 2009

Additional Literature:	3. J. Gareth, W. M. Peter, Methodology for Land and Housing Market Analysis, 1994

Course title:	**GIS in Environment**
Rationale and description of the course:	Application of Geographic Information Systems to studies of the natural environment, such as: definition of GIS, GIS components, nature and source of geographic data, automatic data processing, map digitization, cartographic projections, creation of geo-databases, features, etc.
Course Goals:	The objective of this course is to introduce the student to the most effective computer-based methods for constructing geoscience maps. Emphasis will be on the production of digital GIS maps from scratch using field data, rather than maps based on previously digitized data sets. The course primarily uses commercial and noncommercial software used in GIS.
Expected Learning Outcomes:	After completion of this course, students should be able to do as following: 1. Digitize several maps and add data 2. To use geoinformations in environment 3. To have knowledge on application of GIS for different purposes 4. To design different professional projects independently
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5%

	Attendance 20% Final Exam 55% Total 100%
Primary Literature:	1) Ian H.: An Introduction to Geographical Information Systems, Fourth Edition, 2012 2) Robert S.: GIS for environmental management, 2006
Additional Literature:	An Introduction to the Theory of Spatial Object for GIS, Taylor & Francis Ltd, London, Molenaar, M (1998)

Course title:	**Virtual Cartographic Modeling**
Rationale and description of the course:	The course Cartographic Virtual modeling offers knowledge about: cartographic modeling and images, its specifics and their changing. It also offers knowledge about cartographic models and modern technology in the cartography.
Course Goals:	This course aims the high levels of learning about the virtual modeling science and the techniques of this field.
Expected Learning Outcomes:	- Definitions and concepts and virtual modeling - Cartographic models designs - 3D cartographic models - Advantages comparing with traditional techniques - Data basis preparation and animation
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises*

	- *Work in group*
Assessment Methods:	The way of students evaluation will be as follow: Homework or other commitments: 10% Regular attendance: 10% First colloquium: 25% Second Colloquium: 25% Final exam: 30% Total: 100%
Primary Literature:	1) Axel Hildebrand (1996) A Homogenous Approach from Image Processing in Virtual Reality, Eurographics'96 Tutorial,Fraunhofer IGD, Germany 2) Bandrova T., 3D Cartographic Modeling in Educational Process, 26th International Cartographic Conference, 25-30 August 2013, Dresden, Germany, On-line
Additional Literature:	1) Bandrova T., Bonchev St., 3D maps – scale, accuracy, level of details, 26th International Cartographic Conference, 25-30 August 2013, Dresden, Germany, On-line

Course title:	**Physical geodesy and tectonic**
Rationale and description of the course:	Gravitational law, Laplace's equation and boundary value problems; Gravity field, normal field and anomalous field of the earth; Global gravitational field and spherical harmonic expansions; Stokes' theory; Inversion of Poisson' integral; Molodenski's theory, Bjerhammar's methods and collocation; Global Geopotential Models; Geoid modelling Combination of Stokes' formula with global gravitational models
Course Goals:	This course offers knowledge about determination of gravity field of the earth as one of the main tasks in geodesy, based on measurements on and under

	the earth; theoretical and practical knowledge on measurements of these parameters
Expected Learning Outcomes:	By completing the module, the student should: - Be familiar with the mathematical and physical fundamentals of physical geodesy. - Understand the principles of gravity field determination. - Be able to carry out practical geoid computations.
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	1) Fan, H. (2008). Theoretical Geodesy. KTH 2) Moriz, H.: Advanced Physical Geodesy, WichmanVerlag, Karlsruhe 1989. 3) Klak, S.: Geophysic (Lecture Notes in Croatian), University of Zagreb, 1984.

Additional Literature:	Various webpages related to the content of the course

Course title:	**Advanced Image Processing and Remote Sensing**
Rationale and description of the course:	This is an advanced remote sensing course on sophisticated methods and techniques for collecting, processing and analyzing remotely sensed data; as well as applications of remote sensing in urban planning, environmental monitoring and natural resource management. Throughout the course, emphasis will be placed on image processing, image analysis, image classification, remote sensing and GIS data integration, and applications of remote sensing in various applications.
Course Goals:	Students will gain theoretical knowledge and practical skills on digital image processing, analysis, and applying these techniques in various remote sensing applications.
Expected Learning Outcomes:	After completing this course students should be able : - Remote Sensing & In Situ Data - Image Processing - Image Analysis - Image Classification - Digital Change Detection - Remote Sensing Applications
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*

Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First valuation: 25% Second Valuation: 25% Homework: 10% Attendance: 10% Final Exam: 30% Total: 100%
Primary Literature:	Jensen, J.R., 2005. Introductory Digital Image Processing: A Remote Sensing Perspective, 3rd edition, Prentice Hall, Upper Saddle River, New Jersey. 526 pp.
Additional Literature:	Gonzalez C. R, Woods E. R: Digital Image Processing, 2007

Course title:	**Engineering Survey (mines included)**
Rationale and description of the course:	Course Engineering Survey (mines including) is one of the most important courses of Geodesy. It offers knowledge about: implementation and quality control of geodetic networks, determining surface elements of referent systems, movements of referent geodetic networks, it gives the basis for underground measurements and it includes all the tasks for infrastructure object supervising.
Course Goals:	The aim of this course is to inform students with all responsibilities and tasks of engineering geodesy.
Expected Learning Outcomes:	After completing the course, students should be familiar with: - Surveying instruments (theodolites, levels, total stations): principles, testing and adjusting.

	- Methods of precise distance and angular measurements - Horizontal geodetic networks: design, observation and computation - Height determination: levelling, trigonometric and barometric methods - Precise setting-out and alignment methods and instruments - Mine surveying: connecting surveys and orientation with gyro theodolite. - Deformation measurements: methods and analysis
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First valuation: 25% Second Valuation: 25% Homework: 10% Attendance: 10% Final Exam: 30% Total: 100%
Primary Literature:	1) Kolonja, Y., Hamzai J. Gjeodezia inxhinierike, Libri 2 dhe 3. Tiranë 2) Kavanagh B.F. (2010) Surveying with Construction Applications.
Additional Literature:	1) Schofield W., Breach M. (2007) Engineering Surveying. Elsevier Ltd

Course title:	**GIS Project management**
Rationale and description of the course:	This course deals with knoledges related to general menagament processes and GIS in particular. Initially the course is based on exploring the knowledge to GIS. Then, will continue with a project including the aims, objectives, activities and outputs. SWOT analysis and LFM are one of the main important issues which will be explained. Teaching methodology will be based on PBL, which means that the students will take care of a practical GIS project.
Course Goals:	Knowing the basic principles of project management.
Expected Learning Outcomes:	- After completing the course the student will be able to know, understand and use to basic notions of management in general - The main principles of organization and management of work in projects in particular, in order to more easily afford difficulties facing during and after these studies.
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%

Primary Literature:	Project management institute: A Guide to the Project Management Body of Knowledge – Sixth Edition. Harold Kezner: Project Management: A Systems Approach to Planning, Scheduling, and Controlling.
Additional Literature:	Bela Markus: Geographic Infromation Management, lecture notes

Course title:	**WEB GIS**
Rationale and description of the course:	The aim of the course is to teach students the fundamental theories and technologies for disseminating and processing geographic information by means of Internet and World Wide Web. For this, two specific distributed GIS architectures are studied: the Web-based and the mobile GIS architectures. It is demonstrated through case studies, laboratory exercises, and group projects that these architectures and related technologies allow 1) the creation of dynamic web maps and Internet-based geographic analysis, and 2) the provision of GIS functionality in the field through mobile GIS solutions and in a commercial setting in the form of Location-Based Services (LBSes).
Course Goals:	Main goal of this course is to develop knowledge on basic principles of GIS and its functions in order to manage geospatial data through Web.
Expected Learning Outcomes:	At the end of the course, students should know how to design and implement web maps, Internet-based geographic analysis, and mobile GIS and LBS solutions
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*

Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	3) Sjöberg, LE (2009) Theory of satellite geodesy, KTH 4) Hofmann-Wellenhof, et al. (2008): GNSS, Springe 5) Isufi, E.: Sistemi i Pozicionimit Global - GPS, 2006.
Additional Literature:	www.wikipedia.com

Course title:	**Agriculture Information Systems**
Rationale and description of the course:	This course includes application of GIS and GPS in agriculture. GIS is used to assist precision farming, balancing the need between the economy return from a crop with the environmental impact. An increasing number of farmers are investing in GPS receivers which can pinpoint precise locations by locking onto a network of satellites. Combining this information with digital mapping using GIS allows the farmer to store, analyze and display a wide range of data.
Course Goals:	After the completion of this course students should be able to demonstrate that they have achieved to raise their practical and theoretical knowledge on precise agriculture. They will be informed about source of geospatial data that are more reliable and accurate.
Expected Learning Outcomes:	After the completion of the course, students should be familiar with: - GPS & Guidance

	- Yield Monitoring & Mapping - Remote Sensing for Agriculture - Soil & Crop Sensing - Electronics & Control Systems
Teaching Methods:	- *Lecture* - *Discussion during lectures* - *Exercises* - *Work in group*
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10% Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 55% Total 100%
Primary Literature:	Francis J. Pierse, David Clay: GIS applications in agriculture, 2007
Additional Literature:	Internet GIS: Distributed Geographic Information Services for the Internet and Wireless Networks, authored by Dr. Zhong-Ren Peng and Dr. Ming-Hsiang Tsou. Published by Wiley. 2003.

Course title:	**Decision Support System**

Rationale and description of the course:	This course tends to give the student the concepts and applications of the decision support system, including type of decisions, type of decision makers, modeling decisions, decisions within organizations, rule based expert systems, and simulation as a DSS applications. This module also covers practical issues in DSS such as using Integer and Linear Programming as applications of modeling and solving choices and uncertainties of real world decision problems.
Course Goals:	1) To provide students with the main concepts of Decision Support System (DSS) and management sciences 2) To study the components of DSS and the main players who participate in the decision process 3) To study management science models especially linear and integer programming, network and decision tree 4) To explain key area contributing to DSS such as knowledge acquisition, expert system and knowledge base system *5)* To study group decision support and groupware technologies within organizations
Expected Learning Outcomes:	• Knowledge and understanding • Cognitive skills (thinking and analysis) • Communication skills (personal and academic) • Practical and subject specific skills (Transferable Skills)
Teaching Methods:	- Lecture - Discussion during lectures - Exercises - Work in group
Assessment Methods:	In evaluation, the percentage of the attendance of each partial evaluation in the final evaluation must be determined. One of the ways of evaluation would be: First Evaluation: 10%

	Second Evaluation: 10% Homework or other engagement: 5% Attendance 20% Final Exam 5% Total 100%
Primary Literature:	1. John A. Lawrence, Jr and Barry A. Pasternack, Applied Management Science. 2nd Edition, John Wiley & sons Inc. (2002)
Additional Literature:	