FACULTY OF CIVIL ENGINEERING,
ARCHITECTURE AND GEODESY

UNIVERSITY OF MOSTAR
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GEODESY AND GEOINFORMATICS UNDERGRADUATE UNIVERSITY STUDY PROGRAMME CURRICULUM

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1. INTRODUCTION

The curriculum of the undergraduate university study programmme Geodesy and Geoinformatics is the result of the regular review process, which began with the Decision of the Senate at the session held on 26 February 2022 (No. 01-993-1/22). The regular revision procedure was carried out according to the *Rulebook on the procedure of adopting new and revisions of existing study programmes* (No. 01-993-1 / 22). It stipulates that the Committee coordinates the development of a revised curriculum. The Committee also includes student representatives and external users, and the scientific-teaching council of the Faculty of Civil Engineering, Architecture and Geodesy submits their proposal to the University Senate for adoption.

In order to involve all stakeholders in the process of improving the study programme, a public hearing was held on 24 February 2023 at the Faculty of Civil Engineering, Architecture and Geodesy, University of Mostar (https://fgag.sum.ba/).
The conclusions of the public debate were taken into account during the development of the curriculum.

In addition to the conclusions of the public debate, the recommendations of the Expert Committee from the last institutional accreditation in 2020 were taken into account. The recommendations include practical work outside the University (where applicable), application of legal and internal acts on the minimum share of pre-examination obligations in the final grade of all courses, and the application of modern teaching methods with the student at the centre of the teaching process.

Also, during the development of the curriculum, all strategic tasks in the strategic area of education from the *University Development Strategy 2018-2023*, which relate to the curriculum and teaching process, were carried out (more in the chapter "3.1. Connection with the Development strategy of the University of Mostar).

In addition, when making decisions on the type of changes, all relevant statistical data and survey results collected and conducted in the period since the last revision/adoption of the study programme were analysed:

- Results of student surveys
- Monitoring the development of technologies in geodesy and geoinformatics.
- Monitoring the needs of the labour market

Taking into account all the above, the following changes have been made in this revised curriculum in comparison to the existing one:

- The learning outcomes of the study programme and individual courses are harmonized with Bloom's taxonomy and a matrix of learning outcomes has been created. Syllabi for individual courses are arranged accordingly

- Core courses Field measurements and Land surveying in semester II, which are similar in content, have been combined into a single course Land surveying that remains in semester II
- The core course Geoinformation Modelling is transferred from semester III to semester II
- The core course Photogrammetry is transferred from semester IV to semester III
- The core course Land development is moved from semester VI to semester IV
- A new core course, Geomatics and BIM, is introduced in semester VI. It will cover the increasingly sought-after knowledge and skills in the area of modern technologies in building management.

2. GENERAL INFORMATION ABOUT THE STUDY PROGRAMME

Study programme:	Geodesy and Geoinformatics
Cycle:	1st (undergraduate)
Type:	University study programme
Scientific area:	Technical Sciences
Scientific field:	Geodesy
Academic title:	Bachelor of Geodesy and Geoinformatics
Abbreviation of the academic title:	univ. bacc. ing. geod. et geoinf.
EQF qualification level:	6
Duration of the study programme:	6 semesters
ECTS:	180
Language:	Croatia
Mode of study:	Full time
Awarding institution:	University of Mostar
Institution administering study programme:	University of Mostar, Faculty of Civil Engineering, Architecture and Geodesy
Study programme objectives:	The main objective of introducing this study is to train students for designing, planning and management in the sphere of geodesy and geoinformatics, as well as meeting the needs of the labour market for this personnel. The goals of the geodesy and geoinformatics study programme are primarily aimed at students achieving personal but also scientific competencies and academic skills in the area of geodesy and geoinformatics. The objectives of the study programme can be grouped into several categories: **Technical knowledge.** Obtaining the necessary knowledge in the area of geodesy together with knowledge in mathematics, physics and informatics. The programme must provide deep knowledge of specialized areas: geodesy and geoinformatics. **Practical knowledge.** Obtaining the necessary knowledge for formulating problems and projects, as well as a plan for solving them using various technical knowledge and skills. Among other things, it also includes the development of creative abilities to consider problems and the ability to think critically. **Communicativeness and teamwork.** Obtaining the

	necessary knowledge for the active use of at least one world language, while developing the ability to present one's own results to the professional and general public, as well as developing the ability to work in a team. **Preparations for further studies.** Obtaining the necessary knowledge that will enable further education through graduate academic studies, specialist and doctoral studies. One of the special goals that is in line with the goals of education of experts at the Faculty of Civil Engineering, Architecture and Geodesy, University of Mostar, is the development of students' awareness of the need for permanent education, development of society as a whole and protection of the environment. **Preparations for professional engagement.** Obtaining the necessary knowledge and developing awareness of a wide range of problems and obligations that occur in professional practice: safety, ethics, ecology and economy
Study programme competencies:	- the ability to analyse and exchange information, ideas, problems and solutions with expert and lay persons - the ability to adapt to changes in technology and working methods within lifelong education - the ability to effectively cooperate in professional groups and adapt to the demands of working environment - the ability to understand the influence of geodesy and geoinformatics on the society and environment, and clearly formed moral and ethical attitude in solving professional problems - the ability to apply the acquired knowledge and practices in further professional and academic education - the ability to critically evaluate arguments, assumptions and data when making decisions, and solve professional problems in a creative way - the ability to apply the acquired knowledge in all groups of study courses and technology in geodesy and geoinformatics - the ability to prepare and conduct experiments, and analyse and interpret the results - the ability to detect, identify, describe and solve professional geodetic problems - the ability to use common software tools to create documents, presentations, carry out calculations and simulations

Study programme learning outcomes:	1. State and explain the role of geodesy, geoinformatics and geomatics in everyday life (IU-FGAGGEB-1) 2. Describe and properly select measuring instruments and sensors, methods and technologies for measuring and collecting geospatial data (IU-FGAGGEB-2) 3. Apply theoretical principles, procedures of computer processing and visualization of geospatial data (IU-FGAGGEB-3) 4. Describe the records and registers of real estate and interests in them, distinguish land management measures and land valuation methods (IU-FGAGGEB-4) 5. Consider and distinguish regulations and standards important for geodesy, geoinformatics and geomatics (IU-FGAGGEB-5) 6. Select and apply knowledge of mathematics and physics in identifying, formulating and solving problems in the areas of geodesy, geoinformatics and geomatics (IU-FGAGGEB-6) 7. Measure, collect and interpret geospatial data (IU-FGAGGEB-7) 8. Plan, measure and establish geodetic networks for the purposes of surveying and collecting geospatial data (IU-FGAGGEB-8) 9. Integrate, analyse and visualize geospatial data (IU-FGAGGEB-9) 10. Explain and develop geospatial data models and databases (IU-FGAGGEB-10) 11. Select and use appropriate information and communication technologies in solving geodetic

	and geoinformatics problems (IU-FGAGGEB-11) 12. Present geospatial data and decisions based on it in an interdisciplinary environment (IU-FGAGGEB-12) 13. Compare and interpret the sizes, properties and relationships of objects in space based on geospatial data (IU-FGAGGEB-13) 14. Create geodetic studies for the purpose of collecting new or maintaining existing records and registers of geospatial data (IU-FGAGGEB-14) 15. Develop high moral and ethical standards and responsibility in accordance with the applicable legal framework (IU-FGAGGEB-15) 16. Develop the ability to communicate and work in a team (IU-FGAGGEB-16) 17. Use a foreign professional language in writing and speaking (IU-FGAGGEB-17) 18. Plan the continuation of academic education in the area of geodesy, geoinformatics and geomatics or related disciplines, and develop a culture of lifelong and professional education (IU-FGAGGEB-18)
Opportunities after graduation:	University graduate study of geodesy and geoinformatics or related studies in the technical area Employment in the profession
Accreditation:	The University of Mostar received a Decision on Institutional Reaccreditation on 14 January 2020 from the competent Ministry of Education, Science, Culture and Sports of the HNŽ on the recommendation of the Agency for Development of Higher Education and Quality Assurance of BiH, after which the University was registered in the State Register of Accredited Higher Education Institutions.

3. BASIC CHARACTERISTICS OF THE STUDY PROGRAMME

3.1. Connection with the Development strategy of the University of Mostar

In the *Development Strategy of the University of Mostar 2018 - 2023* in the strategic field of education, several strategic goals are related to the curriculum and its elements.
Objective 1 defines that the University, in cooperation with stakeholders, will develop, approve, implement and continuously monitor and improve study programmes at all levels. The following tasks arise from clearly defined learning outcomes related to labour market needs, following the European Qualifications Framework (EQF):
- task 1: clearly define the objectives and anticipated learning outcomes of each study programme and harmonize the content of the study programme with them, following the appropriate level of the European Qualifications Framework and the qualification standard
- task 2: Introduce a transparent and consistent process of revision and improvement of study programmes with the participation of students and other stakeholders
- task 5: ensure realistic allocation of ECTS credits, through a defined system of ECTS coordination at all study levels
- task 6: improve the interdisciplinarity of all study programmes by enabling elective courses at the university level.

Objective 3 refers to the development of a wide network of teaching bases, including organizations from different fields of activity, to establish cooperation that will enable the connection of practice, science, art, and higher education. The following tasks arise from it:
- task 2: increase the number of hours and the share of teaching practice in the study programmes and the share of ECTS credits acquired by it
- task 3: increase the number of bachelor/master papers related to practical work by the topic and content.

3.2. Compliance with the achievements of a certain scientific/artistic area and labour market and connection with the standards of occupations/qualifications

Objectives, competencies, and learning outcomes at the level of the study programme are defined in a way that is in line with the achievements of a particular scientific/artistic area and labour market and related to the standards of occupations/qualifications.
To harmonize with the achievements of the scientific/artistic area, the representatives of teachers in the Committee for the development of the revised curriculum and other teachers who participated in the development of syllabi for each course took into account current achievements and trends in the scientific area of technical sciences, field of geodesy.
Also, student representatives and external users were appointed to the Committee for the development of the revised curriculum to harmonize with the labour market. A public hearing was organized with participation of experts from practice and business sector: Federal Geodetic Administration, Geodetic Society of Herzeg-Bosnia, Geometrika d.o.o.

Grude, Administration for geodetic and real property affairs of HNŽ. Their suggestions were taken into account when developing the curriculum.
Since no occupational standard or qualification standard has been defined at any level in BiH, the following documents have been taken into account:
- *Decision on the standard classification of occupations in the FBiH (Official Gazette of the FBiH*, Vol. XI, No. 40, No. 8, 2004), which lists occupations under the category "*Gender 2. Experts and Scientists*" **2148 GEODESY AND CARTOGRAPHY ENGINEERS**, whose duties include:
a) designing and setting geodetic control points with determination of their position and height;

b) topographical measurement with the development of plans and maps for the purposes of space development, environmental protection and design in the economy;

c) measurement of property and ownership relations on land for the purpose of establishing, renewing or maintaining cadastral and land register records;

d) creating a land information system (LIS), or, a geographic information system (GIS);

e) geodetic survey for land development; transfer (stake out) of projects, in terms of position and height, to the field according to the project documentation;

f) monitoring and supervision of the position marks of building structures and other structures during construction and geodetic surveying of the condition after construction; developing a study for entering into official records; g) geodetic surveying of underground facilities, installations and lines with development of technical documentation;

h) creating and establishing digital (topographic and thematic) databases;

i) consulting, designing and providing services in the area of geodesy;

j) hydrographic survey and development of sea charts;

k) design of hydraulic structures, watercourse regulation, design of water management reclamation work on land;

l) maintenance of engineering communications and consultations with other relevant experts;

m) preparation of scientific papers;

n) related tasks;

o) supervision of other associates.

In addition to the mentioned document, the following documents are taken into account:

- European Qualifications Framework for Lifelong Learning, EQF
- Qualifications Framework for the European Higher Education Area, QF-EHEA)

Competencies and learning outcomes from all the above documents are implemented in the competencies and learning outcomes at the level of the study programme listed in chapter

"2. General information about the study programme". They are realised in core courses, in order to ensure that all students achieve them with the acquired qualification. The coverage of these learning outcomes at the level of the study programme with the learning outcomes at the level of core courses is presented in the chapter “3.12. Matrix of learning outcomes”.

3.3. Comparability with the study programmes in the country and abroad

The curriculum is comparable to:
- study programmes of geodetic and geoinformatics studies within Bosnia and Herzegovina
- study programmes abroad: undergraduate university study conducted at the reference Faculty of Civil Engineering, Architecture and Geodesy, University of Split, undergraduate university study of the Faculty of Geodesy, University of Zagreb, undergraduate university studies at the University North in Varaždin, other geodetic and geoinformatics studies of the EU member states and the states of the region (Montenegro, Macedonia, Serbia)

Comparability is reflected exclusively in the competencies and learning outcomes at the level of study programmes and in the duration of studies, while the study programme retains its specifics mainly through the structure, course names, and ECTS credits.

3.4. Openness to student mobility

Student mobility is defined by the *Rulebook on international mobility*, which refers to administrative support for students, student mobility documents, insurance, method of application, the procedure for recognizing mobility and information package. The unique recognition methodology is defined at the university level by the Senate Decision on the adoption of a single form for the *Decision on recognition of courses, ECTS credits, grades, and professional practice during student mobility*, which is recorded in the diploma supplement. Students can find information on mobility programmes and accompanying forms on the University's website and through the web page of the assistant for international cooperation on the constituent, who forwards information from the university's International Relations Office to student representatives.

3.5. Conditions for enrolment in the study programme and transfer from other study programmes

The *Rulebook on study of the University of Mostar* defines the right to enrol in undergraduate, graduate, and integrated study programmes, which is done through a public competition. The Senate, at the proposal of the scientific-teaching / artistic-teaching council of the organizational unit, and with the consent of the Governing Board of the University and the competent Ministry of Education, Science, Culture and Sports of HNŽ, announces a public tender. It is published in the daily press, on the website and bulletin board of the Faculty of Civil Engineering, Architecture and Geodesy, and it contains information on the conditions for

enrolment, entrance examination, tuition fees, criteria for selecting candidates, and other information.
When transferring from other study programmes, a request is submitted to the dean of the Faculty of Civil Engineering, Architecture and Geodesy, and the appropriate committee decides on the possibilities and conditions for enrolment.

3.6. Conditions for enrolment in the next semester and year of study and graduation

Conditions for enrolment in the next semester and higher year of study are defined by the *Rulebook on study* of the University of Mostar and the Rulebook on study of the Faculty of Civil Engineering, Architecture and Geodesy, University of Mostar.
The study programme ends with writing and defending a Bachelor's exam that carries 2.0 ECTS credits.
The manner and procedure of defending the Bachelor's exam and the methodology of its preparation are defined in the Rulebook on writing and defending the Bachelor's Thesis of the Faculty of Civil Engineering, Architecture and Geodesy, University of Mostar.

3.7. Organization of study programme

The study programme is organized through two semesters in the academic year, and classes are conducted according to the schedule of classes through weeks.

Professional practice is organized as a core course in semester V. In agreement with their mentor, students should independently use the knowledge and skills acquired during the first four semesters of the undergraduate study programmes to perform field measurements and process measurement data. Develop geodetic studies with a graphic representation for completed project assignments.

The annual study plan also specifies the optional course Professional Practice outside the faculty in semester III.

3.8. Structure of the study programme

The structure of the study programme is reflected in the number of hours of each type of teaching and teaching in total, the number of hours of practice, and the number of hours of independent student work in the total student workload of **180** ECTS credits, or 180 x 30 = 5400 hours of work.
According to the *Rulebook on the procedure for adopting new and revisions of existing study programmes* (No. 01-993-1/22), only core courses are listed in the curriculum, while electives are adopted in the annual curriculum for each academic year. Therefore, the table will show the number of hours of each type of teaching and teaching in total, the number of hours of practice, and the number of hours of independent work only in core courses.

In relation to the total number of ECTS credits, a sum of ECTS credits acquired in elective courses is 23, and the student can choose a total of 18 elective courses.

Besides core and elective courses at the level of the study programme and at the level of the organizational unit, i.e., in addition to 30 ECTS credits per semester, a student can choose university elective courses from the list adopted by the Senate each academic year, which are recorded in student's diploma supplement. University elective courses are available on the SUM website, and students can choose them according to their own desires and they are entered in student's diploma supplement. Link: https://www.sum.ba/sum/studenti/sustav-sveucilisnih-izbornih-kolegija.

The purpose of elective courses at the study programme level is a more detailed elaboration of learning outcomes already acquired in core courses but following student preferences. The purpose of university elective courses is to acquire competencies not provided by the study programme, but that can help students achieve competitiveness in the market and contribute to building one's personality through education.

Structure of the study programme of core courses including certain types of teaching, practice and independent work is given in the following tables.

Year of study: first									
Winter semester									
Course code	Course title	Hours of teaching			I. Teaching in total	II. Hours of practice	III. Independent work	Workload hours, in total (I.+II.+III.)	ECTS
		l	t	S					
FGAGGEB101	Analytical Geometry and Linear Algebra	30	30	0	60	0	90	150	5.0
FGAGGEB102	Mathematical Analysis	30	30	0	60	0	90	150	5.0
FGAGGEB103	Physics	30	30	0	60	0	90	150	5.0
FGAGGEB104	Introduction to Geodesy	30	30	0	60	0	90	150	5.0
FGAGGEB105	Instruments and Sensors in Geodesy	30	20	10	60	0	90	150	5.0
FGAGGEB106	Engineering Graphics in Geodesy and Geoinformatics	15	30	0	45	0	45	90	3.0
In total		165	170	10	345	0	495	840	28.0
ECTS for core courses									28.0
ECTS for elective courses									2.0
ECTS IN TOTAL									30.0

Year of study: first									
Summer semester									
Course code	Course title	Hours of teaching			I. Teaching in total	II. Hours of practice	III. Independent work	Workload hours, in total (I.+II.+III.)	ECTS
		l	t	S					
FGAGGEB207	Computer Geometry	30	30	0	60	0	90	150	5.0
FGAGGEB208	Programming	30	30	0	60	0	90	150	5.0
FGAGGEB209	Land Surveying	30	0	0	30	60	90	150	5.0
FGAGGEB210	Geoinformation Modelling	30	30	0	60	0	90	150	5.0
FGAGGEB211	Basics of Statistics	30	15	0	45	0	75	120	4.0
FGAGGEB212	Vector Analysis	30	15	0	45	0	45	90	3.0
In total (core)		180	120	0	300	60	480	810	27.0
ECTS for core courses									27.0
ECTS for elective courses									3.0
ECTS IN TOTAL									30.0

Year of study: second									
Winter semester									
Course code	Course title	Hours of teaching			I. Teaching in total	II. Hours of practice	III. Independent work	Workload hours, in total (I.+II.+III.)	ECTS
		l	t	S					
FGAGGEB313	Differential Geometry	30	30	0	60	0	90	150	5.0
FGAGGEB314	Databases	30	30	0	60	0	90	150	5.0
FGAGGEB315	Cadastre	30	45	0	75	0	75	150	5.0
FGAGGEB316	Analysis and Processing of Geodetic Measurements	30	45	0	75	0	75	150	5.0
FGAGGEB317	Photogrammetry	30	20	10	60	0	90	150	5.0
FGAGGEB318	Principles of Land Registration Law	30	0	0	30	0	30	60	2.0
In total		180	170	0	360	0	450	810	27.0
ECTS for core courses									27.0
ECTS for elective courses									3.0
ECTS IN TOTAL									30.0

Year of study: second									
Summer semester									
Course code	Course title	Hours of teaching			I. Teaching in total	II. Hours of practice	III. Independent work	Workload hours, in total (I.+II.+III.)	ECTS
		l	t	S					
FGAGGEB419	Cartography	30	30	0	60	0	90	150	5.0
FGAGGEB420	Geodetic Reference Frames	30	30	0	60	0	90	150	5.0
FGAGGEB421	Land Management	30	30	0	60	0	90	150	5.0
FGAGGEB422	Geoinformation Systems	30	30	0	60	0	90	150	5.0
FGAGGEB423	Engineering Geodetic Control	30	30	0	60	0	90	150	5.0
In total		150	150	0	300	0	450	750	25.0
ECTS for core courses									25.0
ECTS for elective courses									5.0
ECTS IN TOTAL									30.0

Year of study: third									
Winter semester									
Course code	Course title	Hours of teaching			I. Teaching in total	II. Hours of practice	III. Independent work	Workload hours, in total (I.+II.+III.)	ECTS
		l	t	S					
FGAGGEB524	Satellite Positioning	30	30	0	60	0	90	150	5.0
FGAGGEB525	Basics of Physical Geodesy	30	30	0	60	0	90	150	5.0
FGAGGEB526	Remote Sensing	30	20	10	60	0	90	150	5.0
FGAGGEB527	Geoinformation Infrastructure	30	30	0	60	0	90	150	5.0
FGAGGEB528	Professional Practice	0	0	0	0	45	45	90	3.0
In total		120	110	10	240	45	405	690	23.0
ECTS for core courses									23.0
ECTS for elective courses									7.0
ECTS IN TOTAL									30.0

Year of study: third									
Summer semester									
Course code	Course title	Hours of teaching			I. Teaching in total	II. Hours of practice	III. Independent work	Workload hours, in total (I.+II.+III.)	ECTS
		l	t	S					
FGAGGEB629	Engineering Geodesy	30	20	0	50	10	90	150	5.0
FGAGGEB630	State Survey	30	30	0	60	0	90	150	5.0
FGAGGEB631	Web GIS	30	30	0	60	0	90	150	5.0
FGAGGEB632	Hydrographic Survey	30	30	0	60	0	90	150	5.0
FGAGGEB633	Geomatics and BIM	30	30	0	60	0	90	150	5.0
FGAGGEB634	Bachelor's Exam	0	30	0	30	0	30	60	2.0
In total		150	180	0	320	10	480	810	27.0
ECTS for core courses									27.0
ECTS for elective courses									3.0
ECTS IN TOTAL									30.0

3.9. The optimal number of enrolled students concerning space, equipment, and number of teachers

Enrolment quotas before the beginning of each academic year are adopted by the Governing Board of the University, at the proposal of the Senate, and with the consent of the competent ministry.

Students can study as full-time students. Full-time students are those who study according to the programme with a full teaching schedule. Full-time students pay their costs by themselves.

3.10. Resources required to conduct the study programme

Teachers from the University and teachers from reference higher education institutions in academic ranks from the relevant scientific area, field, and branch participate in the implementation of the study programme. Data on the structure of teaching staff by rank and education, gender and age structure, scientific research productivity, mobility, and project activities of teaching staff are regularly monitored through the bodies from the quality assurance system. These data are processed at the level of the study programme and organizational unit, and are published in annual reports.

Of physical resources for the implementation of study programmes, the following are required:

- Lecture rooms
- Computer classrooms
- Library

The Faculty of Civil Engineering, Architecture and Geodesy, University of Mostar can easily respond to the modern requirements of teaching and organization of this study both in terms of space and availability of scientific and computer equipment.

Based on the signed cooperation agreements in the implementation of the study programme/professional practice, the resources of other institutions are used (https://fgag.sum.ba/nastava/nastavne-baze):

- the City of Mostar
- Hering d.d. Široki Brijeg
- Ministry of Construction and Physical Planning of HNŽ
- "FORUM 98" d.o.o. Stolac
- Civil Engineering Research Centre
- Federal Administration for Geodetic and Real Property Affairs
- IGH d.o.o. Mostar
- Elektroprivreda HZHB Mostar
- Integra
- Alfa Therm d.o.o.

3.11. Study programme quality assurance system

The purpose, goal, structure, operation and areas of evaluation of the quality assurance system of the University of Mostar are defined by the *Rulebook on the structure and operation of the quality assurance system of the University of Mostar*.
According to the *Rulebook*, the quality assurance system at the University of Mostar consists of permanent bodies of the quality assurance system at the university level: the Quality Assurance and Improvement Committee and the Quality Assurance and Improvement Office.

The Faculty of Civil Engineering, Architecture and Geodesy is operated by the Quality Assurance and Improvement Committee, which consists of the Vice-Dean for Academic Affairs, the Quality Coordinator, the representative of the teaching staff, the student representative, and the representative of the administrative and technical staff. The Quality Coordinator of the Faculty of Civil Engineering, Architecture and Geodesy is also a member of the Quality Assurance and Improvement Committee.

The *Rulebook* defines the competencies and activities of each body from the quality assurance system. Bodies from the quality assurance system carry out regular activities defined by the University *Quality Assurance Manual at the University of Mostar*, which relate to conducting surveys and monitoring and data processing. Based on the implemented activities, annual reports are prepared at the level of the study programme, organizational unit, and the University.

3.12. Matrix of learning outcomes

IU-study programme / IU-course	IU-FGAG GEB-1	IU-FGAG GEB-2	IU-FGAG GEB-3	IU-FGAG GEB-4	IU-FGAG GEB-5	IU-FGAG GEB-6	IU-FGAG GEB-7	IU-FGAG GEB-8	IU-FGAG GEB-9	IU-FGAG GEB-10	IU-FGAG GEB-11	IU-FGAG GEB-12	IU-FGAG GEB-13	IU-FGAG GEB-14	IU-FGAG GEB-15	IU-FGAG GEB-16	IU-FGAG GEB-17	IU-FGAG GEB-18
FGAGGEB101-IU1						x												
FGAGGEB101-IU2						x												
FGAGGEB101-IU3						x												
FGAGGEB102-IU1						x												
FGAGGEB102-IU2						x												
FGAGGEB102-IU3						x												
FGAGGEB103-IU1		x																
FGAGGEB103-IU2		x				x												
FGAGGEB103-IU3		x														x		
FGAGGEB103-IU4		x															x	
FGAGGEB103-IU5		x																
FGAGGEB103-IU6		x																
FGAGGEB104-IU1	x																	
FGAGGEB104-IU2			x															
FGAGGEB104-IU3					x													
FGAGGEB104-IU4							x											
FGAGGEB104-IU5												x						
FGAGGEB105-IU1	x																	
FGAGGEB105-IU2		x																

IU-study programme / IU-course	IU-FGAG GEB-1	IU-FGAG GEB-2	IU-FGAG GEB-3	IU-FGAG GEB-4	IU-FGAG GEB-5	IU-FGAG GEB-6	IU-FGAG GEB-7	IU-FGAG GEB-8	IU-FGAG GEB-9	IU-FGAG GEB-10	IU-FGAG GEB-11	IU-FGAG GEB-12	IU-FGAG GEB-13	IU-FGAG GEB-14	IU-FGAG GEB-15	IU-FGAG GEB-16	IU-FGAG GEB-17	IU-FGAG GEB-18
FGAGGEB105-IU3					x													
FGAGGEB105-IU4							x											
FGAGGEB105-IU5									x									
FGAGGEB106-IU1	x		x															
FGAGGEB106-IU2											X							
FGAGGEB106-IU3											X							
FGAGGEB106-IU4											X							
FGAGGEB207-IU1																		
FGAGGEB207-IU2						x												
FGAGGEB207-IU3						x												
FGAGGEB207-IU4						x												
FGAGGEB207-IU5						x												
FGAGGEB208-IU1											X							
FGAGGEB208-IU2											X							
FGAGGEB208-IU3											X							
FGAGGEB208-IU4											X							
FGAGGEB208-IU5											X							
FGAGGEB209-IU1	x																	
FGAGGEB209-IU2		x																
FGAGGEB209-IU3			x															
FGAGGEB209-IU4								x										
FGAGGEB209-IU5											X							

IU-study programme / IU-course	IU-FGAG GEB-1	IU-FGAG GEB-2	IU-FGAG GEB-3	IU-FGAG GEB-4	IU-FGAG GEB-5	IU-FGAG GEB-6	IU-FGAG GEB-7	IU-FGAG GEB-8	IU-FGAG GEB-9	IU-FGAG GEB-10	IU-FGAG GEB-11	IU-FGAG GEB-12	IU-FGAG GEB-13	IU-FGAG GEB-14	IU-FGAG GEB-15	IU-FGAG GEB-16	IU-FGAG GEB-17	IU-FGAG GEB-18
FGAGGEB209-IU6																x		
FGAGGEB210-IU1			x															
FGAGGEB210-IU2					x													
FGAGGEB210-IU3									x									
FGAGGEB210-IU4										x								
FGAGGEB210-IU5											X							
FGAGGEB211-IU1							x											
FGAGGEB211-IU2						x												
FGAGGEB211-IU3													x					
FGAGGEB212-IU1						x												
FGAGGEB212-IU2						x												
FGAGGEB212-IU3						x												
FGAGGEB313-IU1						x												
FGAGGEB313-IU2						x												
FGAGGEB313-IU3						x												
FGAGGEB313-IU4						x												
FGAGGEB314-IU1										x								
FGAGGEB314-IU2										x								
FGAGGEB314-IU3											X							
FGAGGEB314-IU4											X					x		
FGAGGEB314-IU5											X					x		
FGAGGEB315-IU1	x																	

IU-study programme / IU-course	IU-FGAG GEB-1	IU-FGAG GEB-2	IU-FGAG GEB-3	IU-FGAG GEB-4	IU-FGAG GEB-5	IU-FGAG GEB-6	IU-FGAG GEB-7	IU-FGAG GEB-8	IU-FGAG GEB-9	IU-FGAG GEB-10	IU-FGAG GEB-11	IU-FGAG GEB-12	IU-FGAG GEB-13	IU-FGAG GEB-14	IU-FGAG GEB-15	IU-FGAG GEB-16	IU-FGAG GEB-17	IU-FGAG GEB-18
FGAGGEB315-IU2			x															
FGAGGEB315-IU3				X														
FGAGGEB315-IU4					x													
FGAGGEB315-IU5													x					
FGAGGEB315-IU6														x				
FGAGGEB316-IU1			x															
FGAGGEB316-IU2					x													
FGAGGEB316-IU3						x												
FGAGGEB316-IU4											x							
FGAGGEB317-IU1			x															
FGAGGEB317-IU2		x																
FGAGGEB317-IU3							x											
FGAGGEB317-IU4									x									
FGAGGEB317-IU5												x						
FGAGGEB317-IU6													x					
FGAGGEB318-IU1	x																	
FGAGGEB318-IU2			x															
FGAGGEB318-IU3				X														
FGAGGEB318-IU4					x													
FGAGGEB318-IU5												x	x					
FGAGGEB419-IU1			x															
FGAGGEB419-IU2							x	x										

IU-study programme / IU-course	IU-FGAG GEB-1	IU-FGAG GEB-2	IU-FGAG GEB-3	IU-FGAG GEB-4	IU-FGAG GEB-5	IU-FGAG GEB-6	IU-FGAG GEB-7	IU-FGAG GEB-8	IU-FGAG GEB-9	IU-FGAG GEB-10	IU-FGAG GEB-11	IU-FGAG GEB-12	IU-FGAG GEB-13	IU-FGAG GEB-14	IU-FGAG GEB-15	IU-FGAG GEB-16	IU-FGAG GEB-17	IU-FGAG GEB-18
FGAGGEB419-IU3											x		x					
FGAGGEB420-IU1	x		x															
FGAGGEB420-IU2					x											x		
FGAGGEB420-IU3					x										x			
FGAGGEB420-IU4						x		x			x							
FGAGGEB421-IU1				X														
FGAGGEB421-IU2							x											
FGAGGEB421-IU3									x									
FGAGGEB421-IU4											x							
FGAGGEB422-IU1		x																
FGAGGEB422-IU2			x															
FGAGGEB422-IU3							x											
FGAGGEB422-IU4									x									
FGAGGEB422-IU5												x						
FGAGGEB422-IU6													x					
FGAGGEB423-IU1		x																
FGAGGEB423-IU2					x													
FGAGGEB423-IU3							x											
FGAGGEB423-IU4								x										
FGAGGEB423-IU5												x						
FGAGGEB423-IU6													x					
FGAGGEB524-IU1		x																

IU-study programme / IU-course	IU-FGAG GEB-1	IU-FGAG GEB-2	IU-FGAG GEB-3	IU-FGAG GEB-4	IU-FGAG GEB-5	IU-FGAG GEB-6	IU-FGAG GEB-7	IU-FGAG GEB-8	IU-FGAG GEB-9	IU-FGAG GEB-10	IU-FGAG GEB-11	IU-FGAG GEB-12	IU-FGAG GEB-13	IU-FGAG GEB-14	IU-FGAG GEB-15	IU-FGAG GEB-16	IU-FGAG GEB-17	IU-FGAG GEB-18
FGAGGEB524-IU2			x															
FGAGGEB524-IU3								x										
FGAGGEB524-IU4												x						
FGAGGEB524-IU5																x		
FGAGGEB524-IU6																		x
FGAGGEB525-IU1	x		x			x			x							x		
FGAGGEB525-IU2	x		x			x		x	x							x		
FGAGGEB525-IU3	x		x			x		x	x							x		
FGAGGEB525-IU4	x		x			x		x	x							x		
FGAGGEB525-IU5	x		x			x		x	x							x		
FGAGGEB526-IU1		x																
FGAGGEB526-IU2							x											
FGAGGEB526-IU3			x															
FGAGGEB526-IU4									x									
FGAGGEB526-IU5												x						
FGAGGEB526-IU6													x					
FGAGGEB527-IU1	x																	
FGAGGEB527-IU2			x															
FGAGGEB527-IU3							x											
FGAGGEB527-IU4									x									
FGAGGEB527-IU5																		x
FGAGGEB528-IU1		x																

IU-study programme / IU-course	IU-FGAG GEB-1	IU-FGAG GEB-2	IU-FGAG GEB-3	IU-FGAG GEB-4	IU-FGAG GEB-5	IU-FGAG GEB-6	IU-FGAG GEB-7	IU-FGAG GEB-8	IU-FGAG GEB-9	IU-FGAG GEB-10	IU-FGAG GEB-11	IU-FGAG GEB-12	IU-FGAG GEB-13	IU-FGAG GEB-14	IU-FGAG GEB-15	IU-FGAG GEB-16	IU-FGAG GEB-17	IU-FGAG GEB-18
FGAGGEB528-IU2					x													
FGAGGEB528-IU3							x											
FGAGGEB528-IU4								x										
FGAGGEB528-IU5												x						
FGAGGEB528-IU6													x					
FGAGGEB629-IU1		x																
FGAGGEB629-IU2			x															
FGAGGEB629-IU3					x													
FGAGGEB629-IU4								x										
FGAGGEB629-IU5														x				
FGAGGEB629-IU6																	x	
FGAGGEB630-IU1	x		x			x		x	x							x		
FGAGGEB630-IU2	x		x			x		x	x							x		
FGAGGEB630-IU3	x		x			x		x	x							x		
FGAGGEB630-IU4	x		x			x		x	x							x		
FGAGGEB630-IU5	x		x			x		x	x							x		
FGAGGEB631-IU1			x															
FGAGGEB631-IU2									x									
FGAGGEB631-IU3											x							
FGAGGEB631-IU4											x							
FGAGGEB631-IU5											x					x		
FGAGGEB632-IU1						x												

IU-study programme / IU-course	IU-FGAG GEB-1	IU-FGAG GEB-2	IU-FGAG GEB-3	IU-FGAG GEB-4	IU-FGAG GEB-5	IU-FGAG GEB-6	IU-FGAG GEB-7	IU-FGAG GEB-8	IU-FGAG GEB-9	IU-FGAG GEB-10	IU-FGAG GEB-11	IU-FGAG GEB-12	IU-FGAG GEB-13	IU-FGAG GEB-14	IU-FGAG GEB-15	IU-FGAG GEB-16	IU-FGAG GEB-17	IU-FGAG GEB-18
FGAGGEB632-IU2						x												
FGAGGEB632-IU3							x					x						
FGAGGEB632-IU4			x															
FGAGGEB632-IU5			x															
FGAGGEB632-IU6			x															
FGAGGEB632-IU7				X														
FGAGGEB632-IU8									x									
FGAGGEB633-IU1	x																	
FGAGGEB633-IU2		x																
FGAGGEB633-IU3							x											
FGAGGEB633-IU4								x										
FGAGGEB633-IU5									x									
FGAGGEB633-IU6												x						
FGAGGEB633-IU7													x					
FGAGGEB634-IU1		x	x				x											
FGAGGEB634-IU2									x		x		x					
FGAGGEB634-IU3												x						x

4. STUDY PLAN

The study plan by semesters is given in the following tables.

Year of study: first							
Winter semester							
Course code	Course title	Course status	Hours of teaching			Hours of practice	ECTS
			l	t	s		
FGAGGEB101	Analytical Geometry and Linear Algebra	core	30	30	0	0	5.0
FGAGGEB102	Mathematical Analysis	core	30	30	0	0	5.0
FGAGGEB103	Physics	core	30	30	0	0	5.0
FGAGGEB104	Introduction to Geodesy	core	30	30	0	0	5.0
FGAGGEB105	Instruments and Sensors in Geodesy	core	30	20	10	0	5.0
FGAGGEB106	Engineering Graphics in Geodesy and Geoinformatics	core	15	30	0	0	3.0
ECTS for core courses							28.0
ECTS for elective courses							2.0
ECTS IN TOTAL							30.0

Year of study: first							
Summer semester							
Course code	Course title	Course status	Hours of teaching			Hours of practice	ECTS
			l	t	s		
FGAGGEB207	Computer Geometry	core	30	30	0	0	5.0
FGAGGEB208	Programming	core	30	30	0	0	5.0
FGAGGEB209	Land Surveying	core	30	0	0	60	5.0
FGAGGEB210	Geoinformation Modelling	core	30	30	0	0	5.0
FGAGGEB211	Basics of Statistics	core	30	15	0	0	4.0
FGAGGEB212	Vector Analysis	core	30	15	0	0	3.0
ECTS for core courses							27.0
ECTS for elective courses							3.0
ECTS IN TOTAL							30.0

Year of study: second							
Winter semester							
Course code	Course title	Course status	Hours of teaching			Hours of practice	ECTS
			l	t	s		
FGAGGEB313	Differential Geometry	core	30	30	0	0	5.0
FGAGGEB314	Databases	core	30	30	0	0	5.0
FGAGGEB315	Cadastre	core	30	45	0	0	5.0
FGAGGEB316	Analysis and Processing of Geodetic Measurements	core	30	45	0	0	5.0
FGAGGEB317	Photogrammetry	core	30	20	10	0	5.0
FGAGGEB318	Principles of Land Registration Law	core	30	0	0	0	2.0
ECTS for core courses							27.0
ECTS for elective courses							3.0
ECTS IN TOTAL							30.0

Year of study: second							
Summer semester							
Course code	Course title	Course status	Hours of teaching			Hours of practice	ECTS
			l	t	s		
FGAGGEB419	Cartography	core	30	30	0	0	5.0
FGAGGEB420	Geodetic Reference Frames	core	30	30	0	0	5.0
FGAGGEB421	Land Development	core	30	30	0	0	5.0
FGAGGEB422	Geoinformation Systems	core	30	30	0	0	5.0
FGAGGEB423	Engineering Geodetic Control	core	30	30	0	0	5.0
ECTS for core courses							25.0
ECTS for elective courses							5.0
ECTS IN TOTAL							30.0

Year of study: third							
Winter semester							
Course code	Course title	Course status	Hours of teaching			Hours of practice	ECTS
			l	t	s		
FGAGGEB524	Satellite Positioning	core	30	30	0	0	5.0
FGAGGEB525	Basics of Physical Geodesy	core	30	30	0	0	5.0
FGAGGEB526	Remote Sensing	core	30	20	10	0	5.0
FGAGGEB527	Geoinformation Infrastructure	core	30	30	0	0	5.0
FGAGGEB528	Professional Practice	core	0	0	0	45	3.0
ECTS for core courses							23.0
ECTS for elective courses							7.0
ECTS IN TOTAL							30.0

Year of study: third							
Summer semester							
Course code	Course title	Course status	Hours of teaching			Hours of practice	ECTS
			l	t	s		
FGAGGEB629	Engineering Geodesy	core	30	20	0	10	5.0
FGAGGEB630	State Survey	core	30	30	0	0	5.0
FGAGGEB631	Web GIS	core	30	30	0	0	5.0
FGAGGEB632	Hydrographic Survey	core	30	30	0	0	5.0
FGAGGEB633	Geomatics and BIM	core	30	30	0	0	5.0
FGAGGEB634	Bachelor's Exam	core	0	30	0	0	2.0
ECTS for core courses							27.0
ECTS for elective courses							3.0
ECTS IN TOTAL							30.0