DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

1. GENERAL INFORMATION ON THE STUDY PROGRAMME							
1.1. Name of the study programme	Geology						
1.2. Provider of the study programme	Faculty of Science						
1.3. Type of study programme	Vocational study programme ☐			University study programme **X**			
1.4. Level of study programme	Undergraduate ☐	Graduate **X**		Integrated ☐		Postgraduate specialist ☐	
1.5. Manner of implementation of the study programme	Classical **X**		Mixed (classical + online) ☐		Online in entirety ☐		
1.6. Academic/vocational title earned at completion of study	Master of Science in Geology						
1.7. Total number of ECTS credits	Before the change	120		After the change	120		
1.8. Faculty Council decision on acceptance of changes and additions (enclose)							
1.9. Volume of changes and additions to the study programme	Number of ECTS credits of the unchanged part of the programme:	103					
	Number of ECTS credits of the changed part of the programme:	17					
1.10. Ordinal number of changes and additions to the study programme:		1.11. Estimate of the percentage of changes and additions to the study programme	Less than 20% **X** More than 20% and less than 40% ☐ More than 40% ☐				

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Table 1. Description of changes and additions to the study programme

What changes are made/What additions are made	Number of ECTS credits of the course being changes	Before the change	After the change	Explanation of the change
Elective course **Quaternary Geology** in 1st year of Graduate study of Geology is discontinued in 2010.	-5	5	0	The course Quaternary Geology is being taught in 3rd year of Undergraduate study of geology, and the same course at the graduate study is surplus.
New elective course **Glaciology** in 1st year of Graduate study of Geology is introduced in 2010.	0	0	5	The course is introduced in Geology and paleontology module. Glaciology is an advanced course, and attracts also students from other departments (eg. Biology, Geography). The course is being held together with the Field work in Glaciology, entirely in the field.
New elective course **Field work in glaciology** is introduced at the Graduate study of Geology in 2010.	+5	0	5	The course is introduced in Geology and paleontology module. The Field work in Glaciology is introduced as a complementary course with Glaciology, in order to provide students with field knowledge on glacial sediments and associated facies.
New elective course **Methods of remote sensing in geology** is introduced as a new course at the Graduate study of Geology and Graduate study of Environmental geology in 2010.	+5	0	5	The course is introduced in Geology and paleontology module and Geology of the environment protection module. The course is introduced as a complementary course and building over the courses of Geological mapping I and II which are being taught at the Undergraduate study of geology. The purpose of the course is to acquaint the students with methods of remote sensing and provide necessary knowledge to interpret the geological structures on aerial photographs and satellite images, particularly in hardly accessible and unsafe areas.
Elective course **Stratigraphic classification and correlation** at the Graduate study of Geology is discontinued in 2009.	-5	5	0	The course is discontinued at the Graduate study of Geology because students had insufficient pre-knowledge for the course, and showed no interest in taking it over several years. The course is moved to Postgraduate (Doctoral) study of Geology.
Elective course **Structural**	-5	5	0	The course is discontinued as the course leader retired.

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geomorphology at the Graduate study of Geology is discontinued in 2009.				
Compulsory course **Regional geology and global tectonics** in 1st year of Graduate study of Geology is discontinued in 2010.	-5	5	0	The course is partly substituted by course Plate tectonics.
New compulsory course **Plate tectonics** is introduced in 1st year of Graduate study of Geology in 2010.	+3	0	3	The course is partial replacement of the previous course Regional geology and global tectonics.
New compulsory course **Geology of Croatia** is introduced at the Graduate study of Geology in 2010.	+2	0	2	The course is re-introduced after several years, to suite the students' needs for better understanding of the geology of Croatia.
New elective course **Mineral associations** is introduced at the Graduate study of Geology in 2010.	+5	0	5	The course is introduced in Mineralogy and Petrology module.
The elective course **Zooarcheology** is introduced at the Graduate study of Geology in 2010.	+5	0	5	The course is introduced in Geology and paleontology module, and Geology of the environment protection module.
New compulsory course **Individual field project** is introduced at 2nd year of Graduate study of Geology and 2nd year of Graduate study of Environmental Geology in 2008. godine	+12	0	+12	The course is re-introduced after several years, to suite the students' needs for better field knowledge.
Elective course **Field project** is discontinued at 2nd year of Graduate study of Geology, Geology and paleontology in 2012.				The course is discontinued at the Graduate study of Geology because students showed no interest in taking it over several years. The course is partly substituted by course Individual field project

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Table 2. Description of the new course or the course to which changes and additions are made
*** Copy the table for each proposed new course, or course to which changes and additions are made**

1. COURSE DECRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Tihomir Marjanac, associate professor	1.6. Year of study	1st / 2nd
1.2. Name of the course	**Glaciology**	1.7. Credit value (ECTS)	5
1.3. Associate teachers		1.8. Type of instruction (number of hours L+S+E+e-learning)	45+0+0+0
1.4. Study programme (undergraduate, graduate, integrated)	Graduate study of Geology	1.9. Expected enrolment in the course	4-5
1.5. Status of the course	Elective	1.10. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)	1
2. COURSE DESCRIPTION			
2.1. Course objectives	Familiarizing with glacial processes on the Earth, dynamics of glacial environments, glacial products, variability of glacigenic sediments and sedimentary bodies, proglacial and periglacial environments, facies and products, learning on stratigraphy of Quaternary deposits in Dinaric Alps.		
2.2. Enrolment requirements and required entry competences for the course	Understanding of basic principles of Physical Geology, Physical Geography and principles of field work are essential for enrolment. Basic knowledge of Mineralogy, Petrology and Sedimentology is an advantage. Motivation for study of glacial processes and their products is essential.		
2.3. Learning outcomes at the level of the study programme to which the course contributes	Mastering knowledge and skills for individual research of the young sediments, particularly glacigenic and other sediments which originated in vicinity of ice – which are not being studied in other courses. Learning field research methods.		
2.4. Expected learning outcomes at the level of the course (4-10 learning outcomes)	Achievement of competences which are necessary for 1) field study of glacigenic, proglacial and periglacial sediments, 2) thematical mapping, 3) interpretation of geological relationships in the field, 4) recognition of ice-induced deformations, 5) recognition of ice-sculptured topography.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1) Introduction 2) Snow 3) Avalanches 3) Ice and glaciers 5) Glacial landscapes 6) Glacial and proglacial sediments 7) Glacial depositional bodies 8) Proglacial and periglacial sediments and environments 9) Facies of glacial and periglacial environments		

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	10) Glaciotectonics 11) Methods of research and dating 12) Quaternary stratigraphy 13) Causes of glaciations					
2.6. Type of instruction	x☐ lectures ☐ seminars and workshops ☐ exercises ☐ online in entirety ☐ mixed e-learning x☐ field work		☐ independent study ☐ multimedia and the internet ☐ laboratory ☐ work with the mentor ☐ (other)		2.7. Comments: The course is given in package with the Field course in Glaciology. The course is being taught entirely in the field.	
2.8. Student responsibilities	Regular attendance of lectures, participating in Fieldwork in Glaciology course.					
2.9. Screening of student's work (specify the proportion of ECTS credits for each activity so that the total number of CTS credits is equal to the credit value of the course)*:*	Class attendance	**1**	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay		(Other--describe)	
	Tests		Oral exam	4	(Other—describe)	
	Written exam		Project		(Other—describe)	
2.1. Grading and evaluation of student work over the course of instruction and at a final exam	Student work is being evaluated continuously during discussions on individual studied problems and motifs during lectures. Ability to link individual physical processes and their interactions in genesis of sediments, interpretation of climatic conditions after studied sediments are key competences evaluated at the final exam.					

2.2. Required literature (available at the library and via other media)	**Title**	**Number of copies at the library**	**Availability via other media**
	Glaciology course DVD provided by the course leader.	For each student	DVD
	Easterbrook, D.J. (1988): Dating Quaternary Sediments. Geol. Soc. Am. Spec. Publ.	1	
	Lowe J.J. & Walker M.J. (1997): Reconstructing Quaternary Environments. 2nd ed. Longman, Harlow	1	
	Menzies J. (2002): Modern & Past Glacial Environments. 2nd ed. Butterworth Heinemann, Oxford	1	
	Stepen, J. & Peter, G. (1991): Quaternary Sediments. John Wiley & Sons, London.	1	

2.12. Optional literature (at the time of the submission of the study programme proposal)	Ehlers, J. & Gibbard, P.L. (2004): Quaternary glaciations – extent and chronology. Development in Quaternary science v. 1 – 5. Elsevier BV
2.13. Methods of monitoring quality that	Monitoring activity during lectures and fieldwork.

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ensure acquisition of exit competences	

1. COURSE DECRIPTION – GENERAL INFORMATION

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

1.3. Course teacher	Tihomir Marjanac, associate professor	1.11. Year of study	1st / 2nd
1.4. Name of the course	**Field work in Glaciology**	1.12. Credit value (ECTS)	5
1.4. Associate teachers		1.13. Type of instruction (number of hours L+S+E+e-learning)	45+0+0+0
1.5. Study programme (undergraduate, graduate, integrated)	Graduate study of Geology	1.14. Expected enrolment in the course	4-5
1.6. Status of the course	Elective	1.15. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)	

2. COURSE DESCRIPTION			
2.10. Course objectives	Familiarizing with External Dinaride areas which were affected with Pleistocene glaciation, study of glacial landformes, study of glacigenic sediments, study of periglacial and proglacial sediments, study of ice-induced deformations (glaciotectonics).		
2.11. Enrolment requirements and required entry competences for the course	Knowledge of Physical Geology and Physical Geography. Motivation for field-research of glacigenic processes and products. Knowing the basics of field work.		
2.12. Learning outcomes at the level of the study programme to which the course contributes	Mastering skills and competences for individual research on young sediments, particularly glacigenic, periglacial and proglacial sediments. Mastering field research techniques.		
2.13. Expected learning outcomes at the level of the course (4-10 learning outcomes)	Achieving competences for recognition of glacigenic, proglacial and periglacial sediments, competences for the study of sediments in field, lithofacial mapping, and competences for interpretation of geological features and structures. Recognition of specific deformations induced by ice, recognition of glacial and periglacial landforms.		
2.14. Course content broken down in detail by weekly class schedule (syllabus)	1) Glacial landforms on south Velebit Mt. 2) Glacial sediments and sedimentary bodies in Velika Paklenica Canyon: moraines, glaciofluvial sediments, glaciotectonics 3) Glacial sediments on Veliko Rujno: medial moraine, erratic blocks 4) Glacial sediments in Novigrad Sea: moraines, proglacial lacustrine sediments, ice-marginal sediments, paleosols, glaciofluvial sediments, permafrost 5) Glacial sediments in Ravni Kotari: moraines, proglacial lacustrine sediments, glaciotectonics 6) Field research: mapping, logging, sampling of secondary calcite, sampling fossils		
2.15. Type of instruction	x☐ lectures ☐ seminars and workshops ☐ exercises ☐ online in entirety ☐ mixed e-learning x☐ field work	☐ independent study ☐ multimedia and the internet ☐ laboratory ☐ work with the mentor ☐ (other)	2.16. Comments: The field course is being held coordinated with the Glaciology course, entirely in the field.
2.17. Student responsibilities	Active participation in fieldwork, performing given tasks, possession of personal field equipment and tools.		

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2.18. Screening of student's work (specify the proportion of ECTS credits for each activity so that the total number of CTS credits is equal to the credit value of the course)*:*	Class attendance		Research		Practical training	**2**
	Experimental work		Report	**2**		
	Essay		Seminar essay		(Other--describe)	
	Tests		Oral exam		(Other—describe)	
	Written exam		Project		(Other—describe)	
2.3. Grading and evaluation of student work over the course of instruction and at a final exam	Discussions on individual studied problems and motifs after each day in the field. Evaluation is based on activity during the course, quality of observations and measurements. Grading is equally based on performance in the field and written report.					

2.4. Required literature (available at the library and via other media)	**Title**	**Number of copies at the library**	**Availability via other media**
	Field manual prepared by the course leader.	For each student	Printed material
	Stepen, J. & Peter, G. (1991): Quaternary Sediments. John Wiley & Sons, London.	1	
	Lowe J.J. & Walker M.J. (1997): Reconstructing Quaternary Environments. 2nd ed. Longman, Harlow	1	
	Menzies J. (2002): Modern & Past Glacial Environments. 2nd ed. Butterworth Heinemann, Oxford	1	

2.14. Optional literature (at the time of the submission of the study programme proposal)	Scholary papers in Glaciology.
2.15. Methods of monitoring quality that ensure acquisition of exit competences	Monitoring activity during field-work and performance in application of field techniques.

1. COURSE DECRIPTION – GENERAL INFORMATION

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

1.5. Course teacher	Tihomir Marjanac, associate professor	1.16. Year of study	1st / 2nd
1.6. Name of the course	**Methods of Remote sensing in Geology**	1.17. Credit value (ECTS)	5
1.5. Associate teachers		1.18. Type of instruction (number of hours L+S+E+e-learning)	30+0+15+0
1.6. Study programme (undergraduate, graduate, integrated)	Graduate study of Geology, Graduate study of Environmental geology	1.19. Expected enrolment in the course	4-5
1.7. Status of the course	Elective	1.20. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)	1
2. COURSE DESCRIPTION			
2.19. Course objectives	Familiarizing with remote sensing principles, methods, applications and limitations.		
2.20. Enrolment requirements and required entry competences for the course	Understanding of basic principles of Physical Geology, elementary Physics, basic knowledge of Geological mapping. Motivation for study of remote sensing principles is essential.		
2.21. Learning outcomes at the level of the study programme to which the course contributes	Mastering basic skills for geological interpretation of well-exposed territory, based on analysis of aerial and satellite images.		
2.22. Expected learning outcomes at the level of the course (4-10 learning outcomes)	Mastering skills for recognition and interpretation of lithology, sedimentary bodies, tectonical structures, both in well-exposed and poorly exposed terrains, skills to interpret aerial photographs and produce a photo-geological map. Successful students should be competent to use various photographic sources for remote sensing-based study; aerial photographs, ortophotographs, single-channel and multi-channel satellite images.		
2.23. Course content broken down in detail by weekly class schedule (syllabus)	1) Remote sensing, types, principles, application in Geology. 2) Waves, electromagnetic spectrum, colors, effects of atmosphere. 3) Sensors, properties, resolution. 4) Photographing procedures, aerial phoitographs, satellite imagery, wave lengths, types and properties of images. 5) Aerial photographs, photograms. 6) Properties and types of satellite images. 7) Digital processing of satellite images. 8) Visual interpretation of aerial and satellite images. 9) Application of aerial and satellite images in geology and environment protection. 10) Software for digital processing and analysis of satellite images. 11) Exercises in visual interpretation of aerial photographs, 12) Exercises in digital processing of multispectral satellite images. 13) Exercises in interpretation of stratigraphy and tectonics on selected satellite images.		

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<table>
<tr><td>2.24. Type of instruction</td><td colspan="3">x☐ lectures
☐ seminars and workshops
x☐ exercises
☐ online in entirety
☐ mixed e-learning
☐ field work</td><td colspan="2">☐ independent study
☐ multimedia and the internet
☐ laboratory
☐ work with the mentor
☐ (other)</td><td colspan="2">2.25. Comments:</td></tr>
<tr><td>2.26. Student responsibilities</td><td colspan="7">Regular attendance of lectures and solving given tasks at exercises.</td></tr>
<tr><td rowspan="6">2.27. Screening of student's work (specify the proportion of ECTS credits for each activity so that the total number of CTS credits is equal to the credit value of the course):</td><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Practical training</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td></td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>(Other--describe)</td><td></td></tr>
<tr><td>Tests</td><td></td><td>Oral exam</td><td>4</td><td>(Other—describe)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other—describe)</td><td></td></tr>
<tr><td>2.5. Grading and evaluation of student work over the course of instruction and at a final exam</td><td colspan="7">Discussion on individual studied problems and motifs.</td></tr>
<tr><td rowspan="6">2.6. Required literature (available at the library and via other media)</td><td colspan="5">Title</td><td>Number of copies at the library</td><td>Availability via other media</td></tr>
<tr><td colspan="5">Remote sensing in Geology course DVD provided by the course leader.</td><td>For each student</td><td>DVD</td></tr>
<tr><td colspan="5">Gupta R.P. (2003): Remote Sensing Geology. 2nd ed. Springer</td><td>1</td><td></td></tr>
<tr><td colspan="5">Oluić M. et al. (2002): Snimanje i istraživanje Zemlje iz svemira. Sateliti, Senzori, Primjena. HAZU i GEOSAT</td><td>3</td><td></td></tr>
<tr><td colspan="5">Prost G.L. (2001): Remote Sensing for Geologists: A Guide to Image Interpretation. Taylor & Francis.</td><td>1</td><td></td></tr>
<tr><td colspan="5">Rencz A.N. (1999): Remote Sensing for the Earth Sciences: Manual of Remote Sensing 3.ed. John Wiley & Sons</td><td>1</td><td></td></tr>
<tr><td colspan="5">Donassy, Oluić & Tomašegović (1983): Daljinska istraživanja u geoznanostima. JAZU</td><td>5</td><td></td></tr>
<tr><td>2.16. Optional literature (at the time of the submission of the study programme proposal)</td><td colspan="7">Miller V.C. & Miller C.F. (1961): Photogeology. McGraw Hill</td></tr>
<tr><td>2.17. Methods of monitoring quality that ensure acquisition of exit competences</td><td colspan="7">Monitoring activity during lectures and exercises.</td></tr>
</table>

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1. COURSE DECRIPTION – GENERAL INFORMATION			
1.7. Course teacher	Tihomir Marjanac, associate professor	1.21. Year of study	2nd
1.8. Name of the course	**Individual field project**	1.22. Credit value (ECTS)	7
1.6. Associate teachers	Marijan Kovačić, associate professor	1.23. Type of instruction (number of hours L+S+E+e-learning)	0+0+105+0
1.7. Study programme (undergraduate, graduate, integrated)	Graduate	1.24. Expected enrolment in the course	10
1.8. Status of the course	compulsory	1.25. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)	

2. COURSE DESCRIPTION			
2.28. Course objectives	Mastering field and laboratory research techniques in geology, authoring a geological map and explanatory notes.		
2.29. Enrolment requirements and required entry competences for the course	Geological mapping I and II course, Field courses in geology.		
2.30. Learning outcomes at the level of the study programme to which the course contributes	Mastering basic skills and knowledge for individual geological mapping of a given territory, analysis of collected rock and fossil samples, solving geological structure and integration of all acquired data in a comprehensive report on geological composition of the studied area.		
2.31. Expected learning outcomes at the level of the course (4-10 learning outcomes)	Mastering skills for recognition and interpretation of lithologies in the field, measurement of tectonical elements and recognition of geological structures. Mastering skills and knowledge for analysis and lithological and stratigraphical interpretation of collected rock and fossil samples. Achieving competences for preparation of field geological map, geological sections and column, and preparation of a manuscript geological map and related explanatory report.		
2.32. Course content broken down in detail by weekly class schedule (syllabus)	1) Students individually perform preparation for the field research, study appropriate literature. 2) Students individually map given territory. 3) Students individually describe and analyse collected samples, study thin sections under the microscope, determine lithology of the sampled rocks, determine collected fossils and their age. 4) Students individually prepare a manuscript geological map of the studied area. 5) Students individuallly write a comprehensive report.		
2.33. Type of instruction	☐ lectures ☐ seminars and workshops ☐ exercises ☐ online in entirety ☐ mixed e-learning x ☐ field work	X ☐ independent study ☐ multimedia and the internet ☐ laboratory x ☐ work with the mentor ☐ (other)	2.34. Comments: The course is essentially students' individual field and laboratory work.

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2.35. Student responsibilities	Individual work in the field, obeying safety in field work, periodic reporting of work progress to dedicated mentor, obeying work and deadline schedule.					
2.36. Screening of student's work (specify the proportion of ECTS credits for each activity so that the total number of CTS credits is equal to the credit value of the course)*:*	Class attendance		Research	4	Practical training	
	Experimental work		Report			
	Essay		Seminar essay		(Other--describe)	
	Tests		Oral exam		(Other—describe)	
	Written exam		Project	3	(Other—describe)	
2.7. Grading and evaluation of student work over the course of instruction and at a final exam	Monitoring individual work phases, review of field performance and map, review of written report, grading of final report and geological map.					

2.8. Required literature (available at the library and via other media)	**Title**	**Number of copies at the library**	**Availability via other media**
	Bahun, S.: Geološko kartiranje. Školska knjiga, Zagreb,1993.	10	
	Barnes, J.W. & Lisle, R.J: Basic Geological Mapping (fourth edition). John Wiley & Sons, Ltd, England, 2004.	1	
	Powell, D.: Interpretation of Geological Structures Trough Maps (an introductory practical manual). Longman Scientific & Technical, Group UK Ltd., 1994.	1	
	Dimitrijević, M.: Geološko kartiranje. ICS, Beograd, 1978.	2	

2.18. Optional literature (at the time of the submission of the study programme proposal)	Explanatory notes of Basic geological maps, geological publications on Medvednica and Samoborsko gorje.
2.19. Methods of monitoring quality that ensure acquisition of exit competences	Mentoring each student.

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Table 3. Plan of the study programme according to the accreditation (L- lecture, S – seminar, E – exercises, F – field work)
***As needed, copy the table.**
****As needed, add rows to the table.**

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
I semester Geology and paleontology							
required	5029	Regional geology and global tectonics	60				5
	5030	Quantitative and isotope geochemistry	45		30		7
	5096	Seminar IV		30			2
		Required courses total:					
elective	5033	Karst geology (compulsory)	30		15		6
	5042	Methods in paleontology	15		30		5
	5043	History of geology	30				5
	5044	Paleontological aspects of evolution	30		15		5

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COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
I semester Mineralogy and petrology							
required	5029	Regional geology and global tectonics	60				5
	5030	Quantitative and isotope geochemistry	45		30		7
	5096	Seminar IV		30			2
		Required courses total:					
elective	5035	Petrogenesis	30		15		6
	5057	Gemmology	30		15		5

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COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
II semester Geology and paleontology							
required	5031	Geostatistics	30		15		4
	5103	Field course in Geology IV				75	5
		Required courses total:					
elective	5034	Paleoecology (compulsory)	30		15		6
	5039	Selected topics of vertebrates paleontology	30		15		5
	5040	Geology and geochemistry of crude oil	30		15		5
	5041	Micropaleontology II	15		30		5

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COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
II semester Mineralogy and petrology							
required	5031	Geostatistics	30		15		4
	5103	Field course in Geology IV				75	5
		Required courses total:					
elective	5036	Crystallography	15		30		6
	5054	Microtectonics	15		30		5
	5055	Silicate mineralogy	30		15		5
	5056	Non-silicate mineralogy	30		15		5
	5053	Rock Microstructure			45		5

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COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
III semester Geology and paleontology							
required	5032	Elements of scientific work	30		15		5
	5097	Seminar V		45			3
	5104	Field project		105			12
		Required courses total:					
elective	5045	Marine Geology	30		30		5
	5048	Selected chapters form invertebrate paleontology	30		15		5
	5050	Geology of Fossil Fuels	30		15		5
	5046	Stratigraphic classification and correlation	30		15		5
	5049	Structural Geomorphology	30		15		5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
III semester Mineralogy and petrology							
required	5032	Elements of scientific work	30		15		5
	5097	Seminar V		45			3
	5104	Field project		105			12
		Required courses total:					
elective	5059	Phase and elemental analysis	15		30		5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
IV semester Geology and paleontology							
required	5105	Seminar					5
	5106	Thesis					20
		Required courses total:					
elective	5051	Palaeobotany	30		15		5
	5121	Applied geophysics	30		15		5
	5047	Quaternary Geology	45				5
	5052	Field project				75-180	5-12

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
IV semester Mineralogy and petrology							
required	5105	Seminar					5
	5106	Thesis					20
		Required courses total:					
elective	5058	Interpretation of geochemical data	30		15		5
	5060	Universal stage methods	15		30		5
	5061	Geochemistry of sedimentary rocks	30		15		5
	5098	Field techniques *MP*			45		5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

Table 4. Plan of the study programme with changes and additions (L—lecture, S – seminar, E – Exercises, F – field work)
***As needed, copy the table.**
****As needed, add rows to the table.**

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
I semester Geology and paleontology							
required	71938	Plate tectonics	30				3
	71939	Geology of Croatia	30				2
	44008	Quantitative and isotopic geochemistry	45		30		7
	44011	Seminar IV			30		2
		Required courses total:					
elective	44085	Karst geology (compulsory)	30		15		6
	44101	Methods in paleontology	15		30		5
	44099	History of geology	30				5
	44091	Paleontological aspects of evolution	30		15		5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
I semester Mineralogy and petrology							
required	71938	Plate tectonics	30				3
	71939	Geology of Croatia	30				2
	44008	Quantitative and isotopic geochemistry	45		30		7
	44011	Seminar IV			30		2
		Required courses total:					
elective	44086	Petrogenesis (compulsory)	30		15		6
	44098	Gemmology	30		15		5
	41052	Rock Microstructure			45		5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
II semester Geology and paleontology							
required	44013	Geostatistics	30		15		4
	44018	Field course in geology IV				75	5
		Required courses total:					
elective	44089	Paleoecology (compulsory)	30		15		6
	44108	Selected chapters form invertebrate paleontology	30		15		5
	44106	Geology and geochemistry of crude oil	30		15		5
	44107	Micropaleontology II	15		30		5
	71928	Glaciology	45				5
	71937	Field course in glaciology				45	5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
II semester Mineralogy and petrology							
required	44013	Geostatistics	30		15		4
	44018	Field course in geology IV				75	5
		Required courses total:					
elective	44090	Crystallography (compulsory)	30		15		6
	44110	Microtectonics	15		30		5
	44111	Silicate mineralogy	30		15		5
	44112	Non-silicate mineralogy	30		15		5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
III semester Geology and paleontology							
required	44021	Elementi znanstvenog rada	30		15		5
	44028	Seminar V		45			3
	44031	Individual Field project			105		12
		Required courses total:					
elective	44100	Marine Geology	30		30		5
	44093	Selected chapters form invertebrate paleontology	30		15		5
	44094	Geology of Fossil Fuels	30		15		5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
III semester Mineralogy and petrology							
required	44021	Elements of scientific work	30		15		5
	44028	Seminar V		45			3
	44031	Individual Field project			105		12
		Required courses total:					
elective	44125	Phase and elemental analysis	15		30		5
	71927	Mineral associations	30		15		5

DESCRIPTION OF CHANGES AND ADDITIONS TO UNDERGRADUATE, GRADUATE AND INTEGRATED UNDERGRADUATE AND GRADUATE STUDY PROGRAMMES

COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
IV semester Geology and paleontology							
required	44034	Seminar					5
	44037	Thesis					20
		Required courses total:					
elective	71940	Methods of Remote sensing in geology	30		15		5
	44109	Palaeobotany	30		15		5
	71941	Zooarcheology	30				5
	44123	Applied geophysics	30		15		5

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COURSE STATUS	COURSE CODE	COURSE NAME	TOTAL HOURS				ECTS
			L	S	E	F	
IV semester Mineralogy and petrology							
required	44034	Seminar					5
	44037	Thesis					20
		Required courses total:					
elective	44113	Interpretation of geochemical data	30		15		5
	41054	Universal stage methods	15		30		5
	44114	Geochemistry of sedimentary rocks	30		15		5
	44126	Field techniques *MP*			45		5