

	Subject (code, title, credits)	GEOG 615 Geochemistry and geophysics of landscape 8 ECTS	
	Department	Geography and Environment	
	Level	Master program	
	Term	2021/2022, Fall	
	Instructor	Shahnaz Amanova	
	E-mail 1:	shahnaz.amanova@khazar.org	
	Phone:	+99470 265 95 68	
	Classroom/hours	11 Mehseti str. (Neftchilar campus), Old Building,	
Office hours			
Prerequisites			
Language	English		
Compulsory/Elective	Compulsory		
Required textbooks and course materials	<ol style="list-style-type: none"> Lecture materials of the Instructor. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 N.K. Chertko, Geochemistry, Minsk, 2016, 296 p (<i>Н.К.Чертко. Геохимия, Минск, 2016, 296 с.</i>) N.S. Gasimov. Ecogeochemistry of landscapes, Moscow, 2013, 208 p (<i>Н.С. Касимов. Экогеохимия ландшафтов, Москва, 2013, 208 с.</i>) Geochemistry of landscapes, proceedings of Russian Scientific conference, Moscow, 2016, October 18-20, 685 p. (<i>ГЕОХИМИЯ ЛАНДШАФТОВ (к 100-летию А.И. Перельмана) Доклады Всероссийской научной конференции. Москва, 18-20 октября 2016, 685 с.</i>) Sposob J. (2011) Water balance in terrestil ecosystems. Glinski J, Horabik J., Lipiec J. (eds) Encyclopedia of Agrophysics. Suleymanov M. Foundation of landscape studies. Baku, 2008, 400 p (<i>Süleymanov M. Landşaftşünaslığın əsasları, 2008, 400 s.</i>) 		
Course outline	The course introduces students basic principles of geochemistry and geophysics of landscapes. The modules of this course will help the student to have better understanding migration of chemical elements on the Earth surface, interaction of migration types, water and radiation balance in the landscapes.		
Course objectives	<p>The main objective of the subject is to provide students with fundamental knowledge about the geophysics and geochemistry of landscapes. Course objectives:</p> <ul style="list-style-type: none"> - To gain and apply knowledge and skills of the basics of geochemistry and geophysics of landscapes - To gain and apply knowledge of the basics and approaches to assessing the distribution of chemical elements in the biosphere - To gain and apply knowledge of the calculation of concentration and dispersion coefficients - To gain and apply knowledge of Geochemistry of natural landscapes - To gain and apply knowledge of balance methods in geophysics of landscape 		
Learning outcomes	<p>At the end of this course, in accordance with the objectives, master students should possess the following skills and knowledge:</p> <ul style="list-style-type: none"> - Knowledge of the basics of geochemistry and geophysics of landscapes - Knowledge of the basics and approaches to assessing the distribution of chemical elements in the biosphere - Knowledge of the calculation of concentration and dispersion coefficients - Knowledge of Geochemistry of natural landscapes - Knowledge of balance methods in geophysics of landscape 		
Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm Exam	November	30
	Activity	all the classes of the semester	5
	Attendance	all the classes of the semester	5
	Project	November	10
	Quizzes	October / December 5+5	10
	Final Exam	January	40
Total		100	

Policy	<p>Attendance and participation: The master students are required to attend all classes as part of their studies and those having legitimate reasons for absence (illness, family bereavement etc.) are required to inform the instructor. Generally, four (4) unauthorized absence marks will lead to the master students' expulsion from the course. If a student is late to the class for more than ten (10) minutes, s/he is NOT allowed to enter and disturb the class. However, in such case the master student is able to enter the second double hours without delaying. The attendance and participation will account for 10% of the total course grade, which depends on master students' good class attendance and active participation in class discussions.</p> <p>Preparation for class The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems from the end of the chapter and sample exam questions. Throughout the semester we will also have a large number of review sessions. These review sessions will take place during the regularly scheduled class periods.</p> <p>Withdrawal (pass/fail) In case of failure, a master student will be referred or required to repeat the course the following term or year. For referral, he/she will be required to take examination scheduled by instructor.</p> <p>Quizzes There will be two quizzes. Quizzes will constitute 10 percent of the final grade. Make up quizzes will not be given except in the case of dire emergency. Master students are required to turn in answers to assignments at the beginning of the classes at which they are due. Late assignments will not be accepted.</p> <p>Project is an individual task given to each student and is estimated with a maximum of 10 points (10% of the total course grade). Project will be sent to the instructor's email address (shahnaz.amanova@khazar.org).</p> <p><i>Guidelines</i></p> <ul style="list-style-type: none"> - Each student has to prepare one project. - Projects must be written at least 5 pages with Times New Roman font - Font size 14 kegel - Student has to use the latest references (from the last 5-10 years) <p>Cheating/plagiarism Cheating or other plagiarism during the Quizzes, Mid-term and Final Examination will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations.</p> <p>Professional behavior guidelines The master students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited. Classroom behavior that seriously interferes with either (a) the instructor's ability to conduct the class or (b) the ability of other master students to benefit from the course program will not be tolerated. When a master student's behavior in a class is as seriously disruptive as to compel immediate action, the instructor has the authority to remove a master student from the class on an interim basis, pending an informal hearing on the behavior.</p>
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Tentative Schedule

№	Date/Day	Topics	Readings
1		Introduction. Subject of Geophysics and Geochemistry of Landscapes	<ol style="list-style-type: none"> 1. Suleymanov M. Foundation of landscape studies. Baku, 2008, (pp. 2012-242) 2. Lecture materials of the Instructor
2		Introduction. Subject and methods of geochemistry. <i>History and definition of geochemistry. The subject and objects of geochemistry. The origin and development of geochemistry. Works by F. W. Clark, V. I.</i>	<ol style="list-style-type: none"> 1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6 (https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 1-10)) 2. N.K. Chertko, Geochemistry, Minsk, 2016 (pp. 15-61) 3. N.S. Gasimov. Ecogeochemistry of landscapes,

		Vernadsky, V. M. Goldschmidt, A. E. Fersman.	Moscow, 2013, (pp 5-10) 4. Lecture materials of the Instructor
3		Patterns of migration of chemical elements in landscapes. <i>The prevalence of chemical elements. Macro-and microelements. The average chemical composition of the landscape. Migration activity of chemical elements, water and air migrants, typomorphic elements.</i>	5. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 131-139) 1. 2. N.K. Chertko, Geochemistry, Minsk, 2016 (pp 278-284) 3. N.S. Gasimov. Ecogeochemistry of landscapes, Moscow, 2013 (pp 10-13) 4. Lecture materials of the Instructor
4		Mechanical migration. <i>Regularities of mechanical migration of chemical elements</i>	1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 131-139) 2. Gennadiev A.N. Mechanical migration of elements in soil. Geochemistry of landscapes, proceedings of Russian Scientific conference, Moscow, 2016, October 18-20, (pp 32-37) 3. Lecture materials of the Instructor
5		Physical and chemical migration. Regularities of physical and chemical migration of chemical elements. Water and air migration. The intensity of water migration of chemical elements.	1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 131-139) 2. N.K. Chertko, Geochemistry, Minsk, 2016 (pp 222-234) 3. Lecture materials of the Instructor
6		Biogenic migration. Patterns of biogenic migration. The biological cycle of chemical elements. Biogeochemical barriers. Global consequences of the biological cycle in the biosphere.	1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 141-150, 61-72, 31-40) 2. N.K. Chertko, Geochemistry, Minsk, 2016 (pp 237-260) 3. Lecture materials of the Instructor
7		Technogenic migration. Technogenic geochemical barriers. Complex geochemical barriers	1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 131-139) 2. N.K. Chertko, Geochemistry, Minsk, 2016 (pp 268-278) 3. N.S. Gasimov. Ecogeochemistry of landscapes, Moscow, 2013 (pp 13-14) 4. Lecture materials of the Instructor
Midterm			
8		Geochemical structure of landscapes. Assessment of the intensity of water migration of chemical elements. Determination of biogeochemical coefficients.	1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 2. Lecture materials of the Instructor

9		Assessment of the intensity of water migration of chemical elements.	<ol style="list-style-type: none"> 1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 101-117, 119-129) 2. N.S. Gasimov. Ecogeochemistry of landscapes, Moscow, 2013 (pp 152-174) 3. Lecture materials of the Instructor
10		Determination of biogeochemical coefficients. Clarks of living matter. Biophilicity. Coefficient of biological absorption	<ol style="list-style-type: none"> 1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 2. Lecture materials of the Instructor
11		Geochemistry of natural landscapes	<ol style="list-style-type: none"> 1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 151-159) 2. N.S. Gasimov. Ecogeochemistry of landscapes, Moscow, 2013 (pp 32-59) 3. Lecture materials of the Instructor
12		Geochemistry of technogenic landscapes	<ol style="list-style-type: none"> 1. Christopher S. Cronan, Ecosystem Biogeochemistry / Christopher S. Cronan // Publisher Name: Springer, Cham, 2018. — 203 p. — ISBN 978-3-319-66444-6. https://link.springer.com/book/10.1007/978-3-319-66444-6 (pp 151-159) 2. N.S. Gasimov. Ecogeochemistry of landscapes, Moscow, 2013 (pp 59-145) 3. Lecture materials of the Instructor
13		Balance methods in geophysics of landscapes	<ol style="list-style-type: none"> 1. Suleymanov M. Foundation of landscape studies. Baku, 2008, (pp. 222-242) 2. Lecture materials of the Instructor
14		Water and heat balance	<ol style="list-style-type: none"> 1. Sposob J. (2011) Water balance in terrestrial ecosystems. Glinski J, Horabik J., Lipiec J. (eds) Encyclopedia of Agrophysics. 2. Suleymanov M. Foundation of landscape studies. Baku, 2008, (pp. 222-242) 3. Lecture materials of the Instructor
15		Radiation and biomass balance	<ol style="list-style-type: none"> 1. Suleymanov M. Foundation of landscape studies. Baku, 2008, (pp. 222-242) 2. Lecture materials of the Instructor

*Additional readings and assignments will be provided by the instructor for this course.
If necessary, some minor modifications may be made to this syllabus by the Instructor.*