

	COURSE SYLLABUS « Geology and Geomorphology »	
	Degree of higher education - Bachelor	
	Specialization: 193 Geodesy and Land Management	
	Educational programme: Geodesy and Land Management	
	Academic year: 1, semester: 1	
	Form of study: full-time	
	Number of ECTS credits: 5	
	Language of instruction: English	
Lecturer of the course	Yuriy Kravchenko, PhD, Associate Professor	
Contact information of the lecturer (e-mail)	Soil Science & Soil Conservation Department, build. № 2, room. 23, yukravch@i.ua	
Course page on eLearn	https://elearn.nubip.edu.ua/course/view.php?id=3295	

COURSE DESCRIPTION

This course is an introductory designed course for the Bachelor student, which provides the basic concepts of all aspects of geology. It encompasses: Earth's origin; internal and external Earth's dynamics; minerals and rocks: formation, composition, diagnostics and properties changes; agronomic ores properties and application; anthropogenic influence on geologic environment. The course gives practical experience as an aid in developing understanding of the minerals, rocks and parent materials as natural bodies, the use of which has an influence on environmental, human society and life in general.

Competencies of the educational programme:

Integrated competency (IC):

- the ability to solve complex specialized problems of geodesy and land management.

General Competencies (GC):

- GC 1 - ability to study and hold of up-to-date knowledge;
- GC 2 – ability to use knowledge at practical situations;
- GC 5 - ability to use foreign language;
- GC 7 - ability to work autonomously;
- GC 8 - ability to work in a team;
- GC 9 - ability to interpersonal interaction;
- GC 10 - ability to perform safe activities;
- GC 13 - ability to predict, multiply of moral, cultural, scientific values and achievements of society based on understanding of history, patterns of development of the subject area, its place in the general system of knowledge about nature and society, as well as in the development of society, techniques and technology, using its for recreation and healthy living.

Professional Competencies (PC):

- PC 1 - the ability to apply fundamental knowledge for the analysis of of natural and technogenic phenomena underperforming professional tasks in the field of geodesy and land management.
- PC 2 - ability to apply theories, principles, methods of physical and mathematical, natural, socio-economic, and engineering sciences when performing tasks of geodesy and land management.
- PC 6 - ability to perform remote, ground, field and camera research, engineering calculations for the processing of research results, form research results, prepare reports when solving geodesy and land management tasks;
- PC 7 - ability to collect, update, process, critically evaluate, interpret, store, publish and use geospatial data and metadata about natural and technogenic objects.

Program learning outcomes (PLO):

- PLO 1 - communicate freely orally and in writing in national and foreign languages on matters of professional activity;
- PLO 4 - know and apply in professional activity regulatory and legal acts, regulatory and technical documents, reference materials in the field of geodesy and land management and related fields.
- PLO 5 - apply conceptual knowledge of natural and socio-economic sciences when performing tasks of geodesy and land management;
- PLO 7 - to carry out surveys and search, topographic-geodetic, cartographic, project and project-search works when performing professional tasks in geodesy and land management.

COURSE STRUCTURE

Topic	Hrs lec/ lab	Learning outcomes	Tasks	Asses sm.
Semester 1				
Module 1				
Topic 1. Geology. The Earth as space and physical body.	2/2	<i>Know:</i> The Earth as space and physical body. <i>Be able to:</i> describe Earth's formation and evolution. <i>Analyze:</i> Earth's physical properties. <i>Comprehend:</i> the earth as planetary body. <i>Use:</i> Earth's orbit position in a soil cartography.	Submitting lab work №1	10
Topic 2. Internal and external spheres.	2/2	<i>Know:</i> The Earth's internal and external spheres. <i>Be able to:</i> describe the Earth's internal and external structure. <i>Analyze:</i> The Earth's spheres properties. <i>Comprehend:</i> minerals' structure and physical properties. <i>Use:</i> to describe a soil mineral composition.		
Topic 3. Magmatic, metamorphic and sedimentary processes.	2/2	<i>Know:</i> magmatic, metamorphic and sedimentary processes <i>Be able to:</i> provide a lab testing of minerals. <i>Analyze:</i> internal and external processes. <i>Comprehend:</i> internal and external dynamics. <i>Use:</i> to describe the Earth geological structures, rocks and minerals.		
Topic 4. Plate tectonics and crust deformations.	2/2	<i>Know:</i> plate tectonics and crust deformations. <i>Be able to:</i> distinguish faults and folds. <i>Analyze:</i> types of stress. <i>Comprehend:</i> world system of plates <i>Use:</i> to describe brittle and plastic geological deformations	Submitting lab work №2 Completing self-work 1.1.	15 10
Topic 5. Volcanism.	2/2	<i>Know:</i> volcanoes and volcanism. <i>Be able to:</i> test magma and lava materials. <i>Analyze:</i> types of volcanoes. <i>Comprehend:</i> role of volcanoes in landscape formation <i>Use:</i> in soil genesis.		
Topic 6. Earthquakes.	2/2	<i>Know:</i> theory about earthquakes. <i>Be able to:</i> estimate causes of earthquakes. <i>Analyze:</i> physical properties of major minerals. <i>Comprehend:</i> frequency and distribution of earthquakes. <i>Use:</i> destructive effects of earthquakes in land management.		
Topic 7. Weathering.	2/2	<i>Know:</i> about weathering. <i>Be able to:</i> define the factors that control rates of chemical and mechanical weathering. <i>Analyze:</i> the driving forces of weathering. <i>Comprehend:</i> mechanical, chemical and biological weathering. <i>Use:</i> weathering knowledge in a description of soil genesis.	Submitting lab work №3 Taking mid-term exam 1	15 50
Topic 8. Wind movement.	2/2	<i>Know:</i> wind activity. <i>Be able to:</i> describe a laminar and turbulent movement. <i>Analyze:</i> eolian landforms.		

		Comprehend: wind erosion. Use: eolian deposits influence on a soil formation.		
Total for Module 1				100
Module 2				
Topic 9. Mass wasting.	2/2	Know: mass wasting processes. Be able to: describe a movement of solid particles on slopes. Analyze: factors influencing mass wasting. Comprehend: types of mass wasting. Use: to recognize and minimize mass movement effects.	Submitting lab work №4	10
Topic 10. Rivers.	2/2	Know: rivers activity. Be able to: characterize floods and floodplain deposits. Analyze: streams. Comprehend: base level and stream valley development. Use: at floodplain soils' studying		
Topic 11. Lakes and bogs.	2/2	Know: origin of lakes and bogs. Be able to: classify lakes and bogs. Analyze: igneous rocks. Comprehend: processes of sediments formation in lakes and bogs. Use: at bog soils' studying.	Submitting lab work №5	10
Topic 12. Oceans and seas.	2/2	Know: ocean and sea activity. Be able to: predict coastal hazards. Analyze: metamorphic rocks. Comprehend: coastal erosion and sediment transport Use: at soil/relief genesis studying.		
Topic 13. Glaciers.	2/2	Know: glacial formation. Be able to: classify glaciers. Analyze: sedimentary rocks. Comprehend: glacial deposits, glacial sediments. Use: to recognize landscapes formed under glaciation.	Submitting lab work №6 Completing self-work 2.1.	10 10
Topic 14. Ground waters.	2/2	Know: groundwater and the hydrologic cycle. Be able to: detect springs, water wells and artesian systems. Analyze: groundwater movement. Comprehend: groundwater erosion and deposition. Use: to predict problems caused by human modifications of groundwater system.		
Topic 15. The Quaternary period and soil parent materials.	2/2	Know: the quaternary environmental changes. Be able to: classify types of transported parent material. Analyze: quaternary deposits. Comprehend: soil parent materials formation. Use: quaternary deposits influence on soil profile features.	Submitting lab work №7 Taking mid-term exam 2	10 50
Total for Module 2				100
Total for semester 1 ((100+100)/2) x 0,7				70
Exam				30
Total for course				100

ASSESSMENT POLICY

Policy regarding deadlines and results:	Students are required to take all two mid-term exams and the final exam in this course. Lab reports are submitted on elearn platform. Lab reports submitted after due date will be assessed at a penalty of 10% of the total lab report point value for each 24-hour period beyond the due date. Make-up lab submitting will only be provided for students with excused absences. Students are expected to submit four self-works prior a session.
Academic honesty policy:	Copying of others' work, use of disallowed material on exams, plagiarism in assignments, or cheating in any other form as defined by the instructor will result in a grade of zero for that assignment. Multiple infractions will result in a grade of 'F' for the course. No electronic equipment, except calculators, will be allowed during exams.

Attendance Policy:	Students are expected to be present at all lectures and to arrive on time. If a student must miss a lecture, her/his is responsible for all material presented during lecture and for the assigned textbook reading. Excused absences will only be granted for documented academic conflicts, international staging, documented medical reasons and force majeure. Students are expected to respect the rights of others in the class. Cell phones and other electronic equipment should be turned off prior to the beginning of class.
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SCALE OF ASSESSMENT OF STUDENT KNOWLEDGE

Student's rating, points	National grade based on exam results	
	exams	credits
90-100	«Excellent»	Passed
74-89	«Good»	
60-73	«Satisfactory»	
0-59	«Unsatisfactory»	Not passed

RECOMMENDED SOURCES OF INFORMATION

Textbooks Required:

1. Kravchenko Y.S. Geology with the principles of Geomorphology. Part 1. Dynamic Geology. Київ, ТОВ "Центр ІТ". 2009. 142 с.
2. Тихоненко Д.Г. Геологія з основами мінералогії : навч. посібник. За ред. д-ра с. -г. наук, проф. Д. Г. Тихоненка. К.: Вища освіта, 2003. 287 с.
3. Carlson D.H., Plummer C.C., Hammersley L. Physical Geology. McGraw-Hill, 2015. 672 p.
4. Lutgens F.K., Tarbuck E.J. Essentials of Geology. 13th Edition. — NY, USA: Pearson, 2017. 606 p.
5. Стецюк В.В., Ковальчук І.П. Основи геоморфології: Навч. посіб. / За ред. О.М.Маринича. — К.: Вища школа, 2005. — 495 с.
6. Павловська Т. С. Геоморфологія : навч. посіб. для студ. закл. вищ. освіти / Тетяна Сергіївна Павловська, Іван Платонович Ковальчук. — Луцьк : Вежа-Друк, 2022. — 348 с.

Laboratory books Recommended:

1. Petrenko L., Kravchenko Yu., Starodubtsev V. Elements of Geology. NUBIPU Publishing Center, Kyiv, 2006. 99 pp.
2. Tasa D., Cronin V. Laboratory Manual in Physical Geology. 11th Edition. Pearson, 2018. 471 p.
3. Klein C., Philpotts A. Earth Materials. Introduction to Mineralogy and Petrology. University Printing House, Cambridge CB2 8BS, United Kingdom, 2017. 1925 p.

Additional literature:

1. Murck B., Skinner B. Visualizing Geology. Wiley, 2012. 592 p. in color. 3rd ed.
2. Пальоха. Загальна геологія. Конспект лекцій. 102 с. (Дата звернення 28.05.2023 р.).
https://elearn.nubip.edu.ua/pluginfile.php/596645/mod_page/content/8/%D0%9F%D0%B0%D0%BB%D1%8C%D0%BE%D1%85%D0%B0.%20%D0%97%D0%B0%D0%B3%D0%B0%D0%BB%D1%8C%D0%BD%D0%B0%20%D0%B3%D0%B5%D0%BE%D0%BB%D0%BE%D0%B3%D1%96%D1%8F.doc

Internet sources. Електронний курс

<https://elearn.nubip.edu.ua/course/view.php?id=3295>