SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	**Babeş-Bolyai University of Cluj-Napoca**
1.2 Faculty	**Environmental Science and Engineering**
1.3 Department	**Environmental Analysis and Assessment**
1.4 Field of study	**Environmental Engineering**
1.5 Study cycle	**Bachelor**
1.6 Study programme / Qualification	**Environmental Engineering**

2. Information regarding the discipline

2.1 Name of the discipline	**Geology**						
2.2 Course coordinator	Prof.univ.dr. Călin Baciu						
2.3 Seminar coordinator	Prof.univ.dr. Călin Baciu						
2.4. Year of study	**I**	2.5 Semester	**1**	2.6. Type of evaluation	**E**	2.7 Type of discipline	Compulsory

3. Total estimated time (hours/semester of didactic activities)

3.1 Hours per week	4	Of which: 3.2 course	2	3.3 seminar/laboratory	2
3.4 Total hours in the curriculum	56	Of which: 3.5 course	28	3.6 seminar/laboratory	28
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					16
Additional documentation (in libraries, on electronic platforms, field documentation)					12
Preparation for seminars/labs, homework, papers, portfolios and essays					8
Tutorship					4
Evaluations					2
Other activities:					

3.7 Total individual study hours	42
3.8 Total hours per semester	98
3.9 Number of ECTS credits	4

4. Prerequisites (if necessary)

4.1. curriculum	-
4.2. competencies	-

5. Conditions (if necessary)

5.1. for the course	Room equipped with computer and video projector
5.2. for the seminar /lab activities	Room equipped with graphic materials (boards, 3D models) and sample collections

6. Specific competencies acquired

Professional competencies	• Development of analytical skills by evaluating complex problems and identifying appropriate solutions • Understanding the basic concepts of Geology • Working with notions from different fields of earth sciences
Transversal competencies	• Integration of geology in the system of environmental sciences • Making connections between the different studied disciplines • Understanding the interdisciplinarity of environmental sciences

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	Presentation of the importance of understanding geological phenomena and how geological information can be used in the characterization of environmental problems
7.2 Specific objective of the discipline	• Understanding the information on the genesis of the Earth in the light of the Big Bang theory, the internal composition of the Earth and the main units of geological time with specific characteristics • Understanding the concepts related to the main geological processes that take place inside the lithosphere • Understanding the concepts regarding the processes that take place on the Earth's surface under the influence of exogenous factors • Presentation of the main aspects related to the impact that some geological processes have on the environment

8. Content

8.1 Course	Teaching methods	Remarks
1. Introduction: general notions, notions of cosmology	- Interactive exposure - Dialogue with students - Use of course support	2 hours
2. The internal structure of the Earth, the theory of plate tectonics	- Interactive exposure - Dialogue with students - Use of course support	2 hours
3. Geological time: geochronology, relative age and absolute age	- Interactive exposure - Dialogue with students - Use of course support	2 hours
4. Minerals: definition, physical properties, chemical properties, classification	- Interactive exposure - Dialogue with students - Use of course support	2 hours
5. Magmatic processes: intrusive, extrusive and explosive manifestations, types of rocks	- Interactive exposure - Dialogue with students - Use of course support	2 hours
6. Sedimentary processes: disaggregation, alteration,	- Interactive exposure - Dialogue with students	2 hours

rock types	- Use of course support	
7. Metamorphic processes: metallurgical facies, types of metamorphism, types of rocks	- Interactive exposure - Dialogue with students - Use of course support	2 hours
8. Tectonic deformation processes: crease, fault, detachment, sand cloth	- Interactive exposure - Dialogue with students - Use of course support	2 hours
9. Surface waters: flowing waters, marine and ocean basins	- Interactive exposure - Dialogue with students - Use of course support	2 hours
10. Seismic activity: characteristics and parameters of earthquakes	- Interactive exposure - Dialogue with students - Use of course support	2 hours
11. Landslides: landslides, falls and collapses of blocks, subsidence	- Interactive exposure - Dialogue with students - Use of course support	2 hours
12. Groundwater resources: aquifer, groundwater, artesian water	- Interactive exposure - Dialogue with students - Use of course support	2 hours
13. Mineral and energy resources: metal and non-metallic ore deposits, coal and hydrocarbon deposits	- Interactive exposure - Dialogue with students - Use of course support	2 hours
14. Geology and climate: glaciation, desertification, global warming	- Interactive exposure - Dialogue with students - Use of course support	2 hours
Bibliography: - Montgomery C.W., 1995. Environmental Geology, Wm. C. Brown Publishers, 496 - Plummer C., 2016, Physical geology, McGraw-Hill Education, 651 p. - Rothery D., 2015, Geology, a complete introduction. John Murray Learning, 389 p. - Tarbuck E., 2005, Earth: an introduction to physical geology. Prentice Hall, 712 p. - Zacktser I., 2006, Geology and Ecosystems, Springer, 392 p. - Zumberge J.H., Rutford R.H., 1991. Laboratory manual for physical geology, Wm. C. Brown Publishers, 181 p		
8.2 Seminar / laboratory	Teaching methods	Remarks
1. The formation of the Earth in the context of the Big Bang theory, methods and principles of geological research	- Examination of materials and samples - Solving individual exercises	2 hours
2. Earth's inner shells, the movement of lithospheric plates	- Examination of materials and samples - Solving individual exercises	2 hours
3. Geochronological scale of the Earth, radioactive dating	- Examination of materials and samples - Solving individual exercises	2 hours
4. Examination of mineral samples, physical properties of minerals	- Examination of materials and samples - Solving individual exercises	2 hours
5. Examination of samples and examples of igneous rocks	- Examination of materials and samples - Solving individual	2 hours

	exercises	
6. Examination of samples and examples of sedimentary rocks	- Examination of materials and samples - Solving individual exercises	2 hours
7. Examination of samples and examples of metamorphic rocks	- Examination of materials and samples - Solving individual exercises	2 hours
8. Types of creases, faults and shading blades	- Examination of materials and samples - Solving individual exercises	2 hours
9. Floods, coastal erosion	- Examination of materials and samples - Solving individual exercises	2 hours
10. Seismic activity on the territory of Romania	- Examination of materials and samples - Solving individual exercises	2 hours
11. Classification of Types of Terrain Displacements, Examples	- Examination of materials and samples - Solving individual exercises	2 hours
12. Types of aquifers and groundwater	- Examination of materials and samples - Solving individual exercises	2 hours
13. Examination of samples and examples of metallic and non-metallic ores	- Examination of materials and samples - Solving individual exercises	2 hours
14. Climate changes with geological and anthropogenic causes	- Examination of materials and samples - Solving individual exercises	2 hours
Bibliography: - http://www.csam.montclair.edu/earth/eesweb/gorring/geos112/notes.html - http://www.ac.wwu.edu/~debari/g101/g101.html - http://www.geol.umd.edu/~jmerck/geol100/ - http://www.uh.edu/~jbutler/physical/onlinefall2001.html - http://people.hofstra.edu/J_B_Bennington/gkb1cnotes/gkbmenu.html - http://www.earlham.edu/~parkero/Geos211/2005/2005Lectnotes.htm - http://www.uwgb.edu/DutchS/EarthSC-202VisualsIndex.HTM - http://www.geol.lsu.edu/jlorenzo/PhysicalGeology_S2007/Syllabus.1001_07.html		

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

The structure of the course was made starting from similar courses that appear in the curriculum of other European universities and adapted to the specificity of Romania. The information and concepts presented were chosen following the feedback from various organizations involved in environmental geology studies: NGOs, environmental consulting firms, national and local authorities, etc.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Course	Interest in the presented concepts	Oral – involvement in discussions	20%
	Active presence	Oral – the quality of the questions asked by the student	20%
10.5 Seminar/lab activities	How to work with samples	Written – relevance of observations	30%
	Involvement in solving exercises	Written – the correctness and ingenuity of the solution	30%
10.6 Minimum performance standards			
Each student receives a grade from 1 to 10 for each of the evaluation criteria. In order to be promoted, the student must receive at least a grade of 5 in each of the criteria. The final grade is calculated as a weighted average of the grades obtained in the four criteria.			

Date	Signature of course coordinator	Signature of seminar coordinator
22.11.2024	prof.univ.dr. Călin Baciu	prof.univ.dr. Călin Baciu

Date of approval	Signature of the head of department