University of Gdańsk

Subject card

Subject name and code	Cosmogenic nuclides in geology – lecture, PG_00192991		
Field of study	Geology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Geomorphological Reconstructions -> Department of Geomorphology and Quaternary Geology -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Karol Tylmann	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	15	1.0	9.0	25

Subject objectives

To be familiar with contemporary possibilities of cosmogenic nuclides analysis in geology.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GEOLL3_W04] knows and understands phenomena and processes occurring in the past and today in the interior of the Earth and on its surface, defines the methods of how to study them	To know and to understand phenomena and processes occuring in the past and today on the Earth, which may be analysed with cosmogenic nuclides, to define methods of these studies.	[SW4] test/exam - oral or written
[GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences	To know and to understand terminology related to cosmogenic nuclides and their applications in geoscience.	[SW4] test/exam - oral or written
[GEOLL3_K03] is willing to exercise caution and criticism in receiving information from scientific literature, the Internet and other media related to natural sciences	To be ready to be careful and critical in acceptance of information from scientific literature, Internet and other sources related to cosmogenic nuclides research.	[SK1] oral statement/conversation/ discussion

<table>
<tr><td>Subject contents</td><td>1. Cosmic ray and its impact on geospheres.

2. Genesis and classification of cosmogenic nuclides occuring in the environment.

3. Measurements of the cosmic ray intensity and production rate of the cosmogenic nuclides.

4. Methods of measurements of cosmogenic nuclides concentration in samples.

5. Calibration sites.

6. Selected examples of the application of cosmogenic nuclides in geological studies.

7. Exposure and burial dating with in-situ produced cosmogenic nuclides.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Written test</td><td>51.0%</td><td>80.0%</td></tr>
<tr><td>In-lecture discussiuon</td><td>51.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Dunai T. 2010. Cosmogenic nuclides. Principles, Concepts and Applications in the Earth Surface Sciences. Cambridge University Press, pp. 187.</td></tr>
<tr><td>Supplementary literature</td><td>Gosse J.C., Philips F.M. 2001. Terrestrial cosmogenic nuclides: theory and application. Quaternary Science Reviews 20, 1475-1560.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Cosmic rays definition, origin, nature and properties

2. Radioactive decay nature and types of decay

3. Cosmic radiation observations and measurements

4. Measurements of in-situ cosmogenic nuclides sampling, samples processing, measurements</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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