University of Gdańsk

Subject card

Subject name and code	Dating sediments and natural processes, PG_00192996		
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

Presentation of the theoretical foundations of methods for dating sediments and determining the age of natural processes, with particular emphasis on the methods most frequently used in geology and geomorphology. Familiarity with measuring equipment, calculation procedures, and principles of proper interpretation of results.

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	Knows and understands phenomena and processes occurring in the past and present inside and on the Earth's surface and defines methods for dating them.	[SW4] test/exam - oral or written
[GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences	Knows and understands the terminology related to relative and absolute dating methods.	[SW4] test/exam - oral or written
[GEOLL3_W01] knows and understands the basic natural phenomena and explains their course in relation to geological processes	Knows and understands basic natural phenomena and explains their process in relation to geological processes at a specific time, which can be determined using selected dating methods.	[SW4] test/exam - oral or written

<table>
<tr><td>Subject contents</td><td>1. Basics of stratigraphy.
2. How was the age of the Earth determined, and what was the timing of the most important events on our planet? What are the uncertainties and unknowns?
3. Selected absolute dating methods (C 14, Cs 137, Pb 210, TL and OSL, K-Ar, Ar-Ar, U/Th, Be and Cl, dendrochronology, and varve chronology).
4. Selected relative dating methods (paleomagnetism, core correlation, tephrochronology, palynology chronology, biostratigraphy, 16O / 18O, stratigraphic method).
5. Examples of the use of selected dating methods in research in northern Poland - uncertainty assessment and interpretation of results.</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>test</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>• Bluszcz, A. (2000). Datowanie luminescencyjne osadów czwartorzędowych-teoria, ograniczenia, problemy interpretacyjne. Zeszyty Naukowe. Matematyka-Fizyka/Politechnika Śląska 86, 3-104.
• Rink, W. J., Thompson, J. W. (2015). Encyclopedia of scientific dating methods. Springer.
• Walanus, A., Goslar, T. (2009). Datowanie Radiowęglowe. Wydawnictwo AGH.
• Walker, M. (2005). Quaternary dating methods. John Wiley & Sons.</td></tr><tr><td>Supplementary literature</td><td>• Faure, G., Mensing. T.M. (2004). Isotopes: Principles and Applications. John Wiley and Sons.
• Lian, O. B., Roberts, R. G. (2006). Dating the Quaternary: progress in luminescence dating of sediments. Quaternary Science Reviews, 25(19-20), 2449-2468.
• Tauxe, L. (2010). Essentials of paleomagnetism. University of California Press.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>What is half-life? How are dendrochronological results calibrated to obtain the calendar age of samples? What is varve chronology, what types of sediments can be studied, and what is its time range?</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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