GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Geology and hydrology, PG_00057569						
Field of study	Green Technologies						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	first-cycle studies		Subject group	Optional subject group			
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	4		ECTS credits	2.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Rafał Piątek				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	30
	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	30		5.0		15.0	50
Subject objectives	The aim of the course is to learn the basic geological and hydrological processes that determine the Earth's environment.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U01] is able to obtain information from literature, databases and other sources, is able to integrate the information obtained, to make their interpretation, as well as draw conclusions and formulate and justify opinions, take part in the discussion	The student is able to obtain information from various sources in order to complete the task of giving a seminar in the field of geology and hydrology. The student is able to use literature databases and broadly understood Internet sources.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task
[K6_W03] has a basic knowledge of soil, air and water pollutants, design and supervision of environmentally friendly technologies and technologies which do not produce waste, knows technology of cleaning and neutralization of industrial waste and wastewater management, has a basic understanding of the theoretical basis of methods and types of apparatus used in chemical analysis of environmental pollutants	The student has knowledge of the impact of natural geological processes on climate and air pollution. The student has a basic knowledge of the use of hydrology in environmental protection.	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge
[K6_U05] can formulate and solve engineering tasks analytical methods, simulation as well as experimental, able to apply knowledge of basic physics and mathematics to analyze the results of experiments, is able to analyze and assess existing technical solutions	The student is able to use the knowledge of the basics of physics and mathematics to analyze issues in the field of geology and hydrology, in particular the impact of these fields on the environment.	[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information
[K6_U03] is able to use information and communication technologies relevant to the common tasks of engineering, is able to use known methods and mathematical-physical models to describe and explain phenomena and chemical processes	The student is able to use the known chemical, physical and mathematical relationships to explain phenomena related to geological and hydrological processes, e.g. the dependence of the resistance of rocks to weathering processes on the structure of minerals, linking the mechanism of lithospheric plate tectonics with the principles of thermal convection.The student becomes familiar with information techniques used in geology and hydrology.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment

Subject contents

Course content – lecture
Lectures:

- Basic concepts in hydrology.
- Catchment - its types, characteristics and role in environmental engineering.
- Processes determining the basin outflow. Water balance in the catchment.
- Specificity of urban catchments. The impact of urbanization on the basin.
- Quantitative estimation of water outflow from the uncontrolled catchments.
- Quantitative estimation of water outflow from the controlled basins. Hydrometric measurements and their meaning.
- Chemical and physical structure of minerals as an indicator of the properties of rocks that build the Earth.
- Rock types and the structure of the Earth.
- The main elements of the surface of the Earth and their genesis.
- The theory of plate tectonics: spreding, subduction, transformation faults, continental rifftogenesis, hot spots, cratonons, terranes.
- Young oceans and old continents.
- Island types depending on the mechanism of formation.
- Impact of continent distribution on Earth's climate.
- Climate changes in the geological history of the Earth.

The topics of seminars are agreed with students based on their interest in the Earth and its environment.

Course content – seminar
Seminar Topics:

1. Mid-Ocean Ridges.

2. Islands - Types, Structure, and Origin.

3. Oceanic Trenches in the Context of Lithospheric Plate Boundaries.

4. The Himalayas - Structure and Origin.

5. The Andes - Structure and Origin.

6. Hot Spots - Role in Lithospheric Plate Tectonics.

7. Climate Change in the Quaternary.

8. Geological Events in the Cretaceous and Their Impact on Climate.

9. Origin of the Baltic Sea.

10. The Carpathians - Structure and Origin.

11. Geomorphology of the Tatra Mountains.

12. Hydrothermal Vents.

13. Basics of Ocean Circulation.

14. The Relationship between Climate and the Distribution of Continental Divides.

15. Geological disasters and their impact on climate.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Seminar grade	60.0%	100.0%

Recommended reading

Basic literature	Earth System History, S.M. Stamley, Freeman 1999 New views on an old planet - A history of global change, T.H. van Andel,Cambridge University Press 1994
Supplementary literature	No need.
eResources addresses	

Example issues/ example questions/ tasks being completed	Examples of seminar topics: Hydrology: • Meteorological measurements and observations • About problems with excess rainfall in cities. • Green roofs in urban space • Hydrophyte objects in cities • Polish water resources - quantity, quality, distribution and what results from it ... • Floods as an example of hydrological and economic phenomena • Drought as an example of hydrological and economic phenomena • Narew as an example of a unique river system in the world Geology: • Regional geology of the world e.g. New Caledonia, New Zealand, Indonesian islands, North America etc. • Regional geology of Poland • Causes of glaciation in the Quaternary • Ocean Tethys - the impact of the distribution of oceans and continents on the climate • Earth's environment - forecasts in the context of geological history • Climate change in geological history - research methods
Practical activites within the subject	Not applicable

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