



## Subject card

|   |   |  |  |                                     |                        |            |     |
|---|---|--|--|-------------------------------------|------------------------|------------|-----|
| Subject name and code                       | Geology and hydrology, PG_00057569  |  |  |                                     |                        |            |     |
| Field of study                              | Green Technologies  |  |  |                                     |                        |            |     |
| Date of commencement of studies             | October 2022  |  | Academic year of realisation of subject  |                                     | 2023/2024              |            |     |
| 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<br>No           |            |     |
| Semester of study                           | 4   |  | ECTS credits                             |                                     | 2.0                    |            |     |
| Learning profile                            | general academic profile  |  | Assessment form                          |                                     | assessment             |            |     |
| Conducting unit                             | Department of Microbiology -> Faculty of Chemistry  |  |  |                                     |                        |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr hab. inż. Rafał Piątek                |                                     |                        |            |     |
|   | Teachers  |  | dr hab. inż. Rafał Piątek                |                                     |                        |            |     |
|   |   |  | dr hab. inż. Katarzyna Weinerowska-Bords |                                     |                        |            |     |
| Lesson types and methods of instruction     | 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.  | [SU5] Assessment of ability to present the results of task<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU2] Assessment of ability to analyse information<br>[SU1] Assessment of task fulfilment |
|                                 | [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. | [SU1] Assessment of task fulfilment<br>[SU5] Assessment of ability to present the results of task<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU2] Assessment of ability to analyse information |
|                                 | [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.   | [SU2] Assessment of ability to analyse information<br>[SU1] Assessment of task fulfilment<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[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 basic 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.  | [SW1] Assessment of factual knowledge<br>[SW2] Assessment of knowledge contained in presentation  |
| Subject contents                | <p>Lectures:</p> <ul style="list-style-type: none"> <li>• Basic concepts in hydrology.</li> <li>• Catchment - its types, characteristics and role in environmental engineering.</li> <li>• Processes determining the basin outflow. Water balance in the catchment.</li> <li>• Specificity of urban catchments. The impact of urbanization on the basin.</li> <li>• Quantitative estimation of water outflow from the uncontrolled catchments.</li> <li>• Quantitative estimation of water outflow from the controlled basins. Hydrometric measurements and their meaning.</li> <li>• Chemical and physical structure of minerals as an indicator of the properties of rocks that build the Earth.</li> <li>• Rock types and the structure of the Earth.</li> <li>• The main elements of the surface of the Earth and their genesis.</li> <li>• The theory of plate tectonics: spreading, subduction, transformation faults, continental riftingogenesis, hot spots, cratonons, terranes.</li> <li>• Young oceans and old continents.</li> <li>• Island types depending on the mechanism of formation.</li> <li>• Impact of continent distribution on Earth's climate.</li> <li>• Climate changes in the geological history of the Earth.</li> </ul> <p>The topics of seminars are agreed with students based on their interest in the Earth and its environment.</p> |   |   |
| Prerequisites and co-requisites |   |   |   |
| Assessment methods and criteria | Subject passing criteria  | Passing threshold   | Percentage of the final grade   |
|                                 | Seminar grade   | 60.0%   | 100.0%  |

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| Recommended reading  | Basic literature   | Earth System History, S.M. Stanley, Freeman 1999<br><br>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   | Adresy na platformie eNauczenie:   |
| Example issues/<br>example questions/<br>tasks being completed | <p>Examples of seminar topics:</p> <p>Hydrology:</p> <ul style="list-style-type: none"> <li>• Meteorological measurements and observations</li> <li>• About problems with excess rainfall in cities.</li> <li>• Green roofs in urban space</li> <li>• Hydrophyte objects in cities</li> <li>• Polish water resources - quantity, quality, distribution and what results from it ...</li> <li>• Floods as an example of hydrological and economic phenomena</li> <li>• Drought as an example of hydrological and economic phenomena</li> <li>• Narew as an example of a unique river system in the world</li> </ul> <p>Geology:</p> <ul style="list-style-type: none"> <li>• Regional geology of the world e.g. New Caledonia, New Zealand, Indonesian islands, North America etc.</li> <li>• Regional geology of Poland</li> <li>• Causes of glaciation in the Quaternary</li> <li>• Ocean Tethys - the impact of the distribution of oceans and continents on the climate</li> <li>• Earth's environment - forecasts in the context of geological history</li> <li>• Climate change in geological history - research methods</li> </ul> |  |
| Work placement   | Not applicable   |  |

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