



## Subject card

Subject name and code	, PG_00037564						
Field of study	Green Technologies						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2021/2022		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			English		
Semester of study	4	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geotechnics, Geology and Marine Civil Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Maria Przewłócka, doc. PG					
	Teachers	dr inż. Maria Przewłócka, doc. PG dr hab. inż. Tomasz Kolerski					
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						
Adresy na platformie eNauzanie: Geology and hydrology 2022 - Moodle ID: 22095 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=22095">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=22095</a>							
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	10.0	35.0	75		
Subject objectives	<p>geology part - the aim is to get acquainted students with inner and external geological processes, especially rocks and mineral forming processes. Acquiring skills in rocks and minerals identification and description and knowledge concerning conditions of groundwater occurrence.</p> <p>hydrology part - the aim is get acquainted students with the following issues: precipitation forming, rainfall measurement; surface runoff, rainfall excess, unit hydrograph, flood wave transformation, open channel flow; basic knowledge about hydraulic structures</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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	Student identifies and describes basic minerals and rocks occurring in the Earth's crust. Student assesses groundwater vulnerability on the basis of hydrogeological data	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[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	Student understands and interprets geological processes influencing the Earth relief and the changes occurring on it's surface. Student understands and interprets conditions of groundwater occurrence and basic hydrological processes	[SW1] Assessment of factual knowledge
Subject contents	<p>the Earth's structure; geologic time, inner geological processes (volcanism, plutonism, metamorphism), external geological processes (weathering, erosion, mass wasting); plate tectonics theory, basic tectonic structures; the rock cycle;</p> <p>minerals: physical properties, recognition and description of : quartz, feldspars, micas, amphiboles, pyroxenes, olivines, magnetite, hematite, pyrite, galena, calcite, halite, gypsum, limonite</p> <p>rocks: forming, mineral composition, textures, classification; identification and description of rocks:</p> <ul style="list-style-type: none"> <li>- igneous: granite, rhyolite, pegmatite, diorite, andesite, gabbro, basalt</li> <li>- sedimentary: conglomerate, sandstone, silt, clay, boulder clay, compact limestone, fossiliferous limestone, flint</li> <li>- metamorphic: schists, gneiss, marble, quartzite, serpentinite, granulite</li> </ul> <p>Basic information on hydrogeology: groundwater table, gaining and losing streams, porosity, permeability, hydraulic coefficient, Darcy's law; hydrogeological cross-section</p> <p>precipitation forming,</p> <p>rainfall measurement;</p> <p>surface runoff, rainfall excess,</p> <p>unit hydrograph,</p> <p>flood wave transformation,</p> <p>open channel flow; hydraulic structures; tanks</p>		
Prerequisites and co-requisites	basic knowledge on physics and chemistry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	hydrology test	60.0%	50.0%
	geology test	60.0%	30.0%
	hydrogeology exercise	60.0%	20.0%

Recommended reading	Basic literature	<ul style="list-style-type: none"> <li>• <i>Modern Physical Geology</i> - Thompson &amp; Turk</li> <li>• <i>Understanding Earth</i> – Press, Siever, Grotzinger, Jordan</li> <li>• <i>Applied Hydrogeology</i> – C.W. Fetter</li> <li>• Chow V. T., <i>Handbook of Applied Hydrology</i>, 1964 Edition (or later) McGraw Hill, Inc.</li> <li>• Mays L. W., <i>Water Resources Engineering</i>, 2005 Edition (or later) John Wiley &amp; Sons, Inc.</li> <li>• Viessman W., Lewis G. L. <i>Introduction to Hydrology</i>, Prentice Hall, 2003 (or later edition)</li> <li>• Henderson, F., M., <i>Open Channel Flow</i>, Prentice Hall, 1966</li> <li>• Kolarski T., <i>Praktyczne aspekty gospodarki wodnej w projektowaniu zbiorników retencyjnych</i>, Wyd. PG, 2014</li> </ul>
	Supplementary literature	<ul style="list-style-type: none"> <li>• <i>The Encyclopedia of Applied Geology</i> - Ch. W. Finkl</li> <li>• <i>Environmental Geology Principles and Practise</i> – F. G. Bell</li> <li>• <i>Geological Dictionary</i> – R. Żyłka</li> <li>• <i>Guide to Rocks and minerals</i> – Simon &amp; Schusters</li> <li>• <i>Rocks gems and minerals</i> – H. S. Zim and P.R. Shaffer</li> <li>• <i>Physical and Chemical Hydrogeology</i> – P.A. Domenico, F.W. Schwartz</li> </ul>
	eResources addresses	Geology and hydrology 2022 - Moodle ID: 22095 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22095">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22095</a>
Example issues/ example questions/ tasks being completed	<p>What is the mineral composition and the texture of granite.</p> <p>Charakterize divergent plate boundaries and name geological event occurring there.</p>	
Work placement	Not applicable	