



## Subject card

Subject name and code	, PG_00037590						
Field of study	Green Technologies						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2020/2021		
Education level	first-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			English		
Semester of study	2	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Microbiology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Paweł Sachadyn					
	Teachers	mgr inż. Agata Terebieniec prof. dr hab. inż. Paweł Sachadyn					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	E-learning hours included: 0.0						
	Address on the e-learning platform: <a href="https://enauczanie.pg.edu.pl/moodle/mod/page/view.php?id=306934">https://enauczanie.pg.edu.pl/moodle/mod/page/view.php?id=306934</a> Adresy na platformie eNauczenie: Environmental Biology Lecture - Moodle ID: 9009 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=9009">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=9009</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	45	15.0	65.0	125		
Subject objectives	The aim of the subject is:  1) to give the basic knowledge on microbial world, fundamentals of microbiology and molecular biology, which is necessary to  2) show the role of microorganisms in the environment						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W04] is aware of the importance of environmental protection and has a basic knowledge of chemical and biological threats to the environment, with particular emphasis on anthropogenic factors, has a basic knowledge of knowledge of the principles of sustainable development as well as national and European environmental management conditions.	The student knows and understands the influence of living organisms on the condition and functioning of environment.	[SW1] Assessment of factual knowledge
	[K6_U04] capable of formulating and solving design tasks in the field of environmental technology to recognize their non-technical aspects, including environmental, economic and legal. Is capable of applying the principles of occupational health and safety. Is able to make initial assessment of engineering solutions and actions	The student is able to use the knowledge on environmental biology, including the molecular aspects in the design of technological processes.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
Subject contents	<ol style="list-style-type: none"> <li>1. Introduction to the world of microbes.</li> <li>2. Principles of microscopy and staining.</li> <li>3. Sterilization and disinfection.</li> <li>4. Cultivation of microorganisms.</li> <li>5. Microbial ecology, aquatic and soil biogeochemical cycles, mutagens and gene transfer.</li> </ol>		
Prerequisites and co-requisites	basics of biology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam mark (test of choice and interview)	60.0%	60.0%
	laboratory mark (laboratory reports and final test)	60.0%	40.0%
Recommended reading	Basic literature	lecture print-outs	
	Supplementary literature	<ul style="list-style-type: none"> <li>•Eugene Nester, C. Evans Roberts, Martha Nester, Microbiology a Human Perspective</li> <li>•Jacquelyn G. Black, Microbiology - Principles &amp; Applications</li> </ul>	
	eResources addresses	Environmental Biology Lecture - Moodle ID: 9009 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=9009">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=9009</a>	

<p>Example issues/ example questions/ tasks being completed</p>	<p>Lecture 5: Microbial ecology, aquatic and soil biogeochemical cycles  The role of microbes in biogeochemical cycles: carbon cycle, nitrogen cycle, sulphur cycle, phosphorous cycle.  The biologically available forms of C, N, S, P.  Greenhouse effect.  Microorganisms in soil: limiting factors,  The main groups of soil microbes.  Decomposition of synthetic chemicals.  Soil pathogens of plants and animals.  Biological magnification.  Microorganisms in waters: limiting factors.  The zones in lake and the habitants of zones.  The role of phytoplankton.  Conditions in oceans.  Eutrophication, BOD.  Microorganisms in air: typical representatives and control  Microbial competition.</p>
<p>Work placement</p>	<p>Not applicable</p>