



## Subject card

Subject name and code	Introduction to environmental science, PG_00048758						
Field of study	Green Technologies						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2021/2022		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Humanistic-social subject group		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			English		
Semester of study	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Colloid and Lipid Science -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Christian Jungnickel				
	Teachers		dr hab. Christian Jungnickel				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Address on the e-learning platform: <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17578">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17578</a> Adresy na platformie eNauczanie:							
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	Understanding of basic ecosystem interactions, and balance and fate of chemicals in the environment.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[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 study of pollutants, and their formation, will allow students to understand, how we, and our technologies influence the environment.			[SU2] Assessment of ability to analyse information		
	[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 will learn the basic environmental cycles of matter, and how humans impact them.			[SW3] Assessment of knowledge contained in written work and projects		
[K6_K06] has awareness of the importance of non-technical aspects and effects of engineering activities, including its impact on the environment and the associated responsibility for decisions.	The seminars will discuss various technical and engineering issues, and the effect on our society.			[SK4] Assessment of communication skills, including language correctness			

Subject contents	The course is divided into two blocks - lecture series and seminar series. The lecture series will outline the importance of environmental science and its importance of understanding the basics of environmental science to allow for prediction of chemical fates and impact of contaminants. Principles of ecology. Trophic levels. Autotrophs and heterotrophs. Ecosystem structure and function. Ecosystem balance and imbalance. Ecosystem stability. Predator/prey relationships. Basic Gaia theory. The earth and its mineral resources. Environmental compartments. Pollution - definition, sources, effects. Air pollution. Water pollution. Soil pollution. Primary and secondary effects: smog, acid rain, global warming, ozone layer depletion. Fuels and sustainable development. Water – principle requirement for life. Water resources: Preserving our liquid assets. Population: measuring growth and its impact. Bacterial growth and limiting factors. Population control: key to a sustainable society. The students will prepare a presentation to a specific environmental topic, including, ecological extremes, ecological imbalance. Specific sources of pollution and their impact on the environment in soil/water/air compartments. Sources of energy and their environmental impact. Water sources and resources, and issues of overpopulation. After each student presentation the topic is the open for general discussion for further explanation. The students will be given an introduction into referencing and plagiarism.														
Prerequisites and co-requisites	Good command of the English language.														
Assessment methods and criteria	<table border="1" data-bbox="448 501 1487 539"> <thead> <tr> <th data-bbox="448 501 794 539">Subject passing criteria</th> <th data-bbox="794 501 1141 539">Passing threshold</th> <th data-bbox="1141 501 1487 539">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 539 794 568">test - seminars</td> <td data-bbox="794 539 1141 568">50.0%</td> <td data-bbox="1141 539 1487 568">25.0%</td> </tr> <tr> <td data-bbox="448 568 794 598">test - lectures</td> <td data-bbox="794 568 1141 598">50.0%</td> <td data-bbox="1141 568 1487 598">50.0%</td> </tr> <tr> <td data-bbox="448 598 794 640">colloquium</td> <td data-bbox="794 598 1141 640">50.0%</td> <td data-bbox="1141 598 1487 640">25.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	test - seminars	50.0%	25.0%	test - lectures	50.0%	50.0%	colloquium	50.0%	25.0%
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Recommended reading	Basic literature	State of the World 2000 - 2003, a Worldwatch Institute, Report on Progress Toward a Sustainable Society, W.W. Norton & Company, New York, London. S.F. Zakrzewski, People, Health and Environment, SFZ Publishing, Amherst N.Y., 1993. L.Brown, M.Renner, B.Halweil, Vital Signs 2000 - 2003, Worldwatch Institute. I.D.White, D.N.Mottershead, S.J.Harrison, Environmental Systems, An Introductory Text, Printed by Great Britain by Butler and Tunnor, Frome, Somerset, 1984. H.French, Vanishing Borders - Protecting the Planet in the Age of Globalization, Worldwatch Institute, USA, 2000. P.Huber, Hard Green - Saving the Environment From the Environmentalists, a Conservative Manifesto, Basic Books, USA, 1999. L.Ryden, P.Migula, M.Andersson (editors), Environmental Science, Almqvist and Wiksell Tryckeri, Uppsala, Sweden, 2003. J.Namieśnik, T.Górecki, W.Wardencki, B.Zygmunt, L.Torres, Secondary Effects and Pollutants of the Environment, Politechnika Gdańska, 1993.													
	Supplementary literature	No requirements													
	eResources addresses														
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. What is enhanced oil recovery? Describe TWO methods.</li> <li>2. How is the Dissolved Oxygen (DO) inside a body of water affected by eutrophication? Why does this change of DO occur?</li> <li>3. Describe the difference between <i>in-situ</i> and <i>ex-situ</i> remediation techniques.</li> <li>4. What are methane clathrates?</li> <li>5. What is the difference between London smog and Photochemical smog?</li> </ol>														
Work placement	Not applicable														