



## Subject card

Subject name and code	Microbiological aspects of ecosystems , PG_00057768						
Field of study	Green Technologies						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
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		Polish		
Semester of study	2		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor						
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		5.0		35.0	100
Subject objectives	The course offers fundamentals of the following topics with an emphasis on the aspects relevant to environmental science and engineering applications: chemistry of life; fundamentals of microbial metabolism; anabolism; catabolic diversity; ecological concepts and natural microbial ecosystems; engineered microbial ecosystems and microbiological aspects of drinking water purification and wastewater treatment; microbial bioremediation; biotechnology and industrial applications.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U02] is able to operate equipment and perform typical analyzes of studies of environmental pollution, is able to carry out an analysis of typical environmental pollution and simple devices according to specification	Is able to operate typical apparatus and perform analysis on environmental pollution research,	[SU4] Assessment of ability to use methods and tools
	[K6_K02] is aware of the social role of a technical college graduate, take the reflections on the ethical, scientific and social aspects of the work performed, understands the need to promote, formulating and providing the public with information and opinions concerning the activities of the profession of engineer.	The student is aware of social responsibility and the impact of engineering work on the environment and its responsibility	[SK4] Assessment of communication skills, including language correctness
	[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.	Is aware of the importance of environmental protection, has knowledge of chemical and biological threats to the environment, with particular emphasis on anthropogenic factors,	[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	Can formulate and solve project tasks in the field of environmental technology, applies the principles of occupational safety and health.	[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	Has knowledge of environmental protection from pollution, theoretical basis of methods and types of apparatus used in the analysis of environmental pollution	[SW1] Assessment of factual knowledge
Subject contents	Transfer of fundamental knowledge on; 1.microbial metabolism and its components, 2.major microbial catabolic pathways, 3.water and wastewater microbiology, role of microorganisms in treatment processes, and transfer of applied knowledge for; 4.direct hands on (students) run of experimental measurement/analysis of microbiological parameters significant for environmental science and engineering applications		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory exercises	60.0%	50.0%
	test	60.0%	50.0%
Recommended reading	Basic literature	1. Microbial Ecology: Fundamentals and applications, 4 edycja, Ronald M. Atlas, Richard Bartha  2. Environmental Biology 3 edycja Ian L. Pepper, Charles P. Gerba, Terry J. Gentry	
	Supplementary literature	publication from scientific journals	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	1. give ways of microbiological treatment of drinking water and wastewater treatment; 2. microbial bioremediation 3. biotechnology - industrial applications.
Work placement	Not applicable