University of Gdańsk

Subject card

Subject name and code	Technology of soil remediation, PG_00117764		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	postgraduate 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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	1.0
Learning profile	academic	Assessment form	
Conducting unit	Pracownia Fotokatalizy -> Katedra Technologii Środowiska -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Ewelina Grabowska-Musiał	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	0.0	0.0	15
	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	15	2.0	8.0	25

Subject objectives

Familiarizing students with all issues mentioned in the lecture program content.

To familiarize students with the main stages of the technological process used to remediate contaminated soils.

To familiarize students with instrumental analysis techniques.

Developing the ability to independently perform calculations necessary for the correct interpretation of analysis results Developing the ability to independently select the appropriate remediation technique for a given purpose.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_W02] Has extended and in-depth knowledge in the field of basic chemistry.	Talks about environmental remediation technology issues in understandable language, using correct nomenclature	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
[CHEMMU2_K03] Understands the need for systematic work on various projects of a long-term nature and knows how to set priorities for the implementation of undertaken tasks.	Talks about environmental remediation technology issues in understandable language, using correct nomenclature	[SK5] implementation of a problem task [SK8] observation of student's independent or team work
[CHEMMU2_W12] Knows the principles of occupational health and safety to the extent that allows independent work on a research and/or measurement position.	applies safety rules in the workplace	[SW5] implementation of a problem task
[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	can independently search for additional literature and expand knowledge based on it	[SK5] implementation of a problem task
[CHEMMU2_U01] Plans and implements chemical experiments of medium complexity.	Demonstrates the ability to carry out physicochemical and technological measurements, important for removing pollutants from the soil environment	[SU4] test/exam - oral or written [SU8] observation of student's independent or team work
[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	It assesses selected properties of contaminated soil and assesses its effectiveness remediation of contaminated soils (by bioremediation and washing)	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion

Subject contents

Sources and types of pollution. Characteristics of pollutants: pesticides and petroleum substances, heavy metals and radionuclides. Soil characteristics. Types of soil sorption. Spread of harmful substances in the environment. Characteristics of groundwater. The fate of pollutants in water and soil (chemical, biochemical and photochemical processes). The impact of pollutants on the physical and mechanical properties of soil. Soil reclamation - definitions and basic tasks of the process. Division of soil remediation methods. Physico-chemical methods of soil reclamation. Biological methods of soil reclamation. Thermal methods of soil reclamation. Stabilization and solidification In-situ and ex-situ groundwater purification methods. Methods of sealing waste landfills and types of insulating layers.

Prerequisites and co-requisites

General chemistry, organic chemistry, inorganic chemistry, analytical chemistry, physical chemistry.

Knowledge of the basics of general chemistry, organic chemistry and physical chemistry, as well as knowledge of the basics of chemical analysis methods.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
laboratory exercises	51.0%	100.0%

Recommended reading

Basic literature	Kowalik P., Ochrona środowiska glebowego, PWN, Warszawa, 2001. Zadroga B., Olańczuk-Neyman K., Ochrona i rekultywacja podłoża gruntowego, Wydawnictwo Politechniki Gdańskiej, 2001. Greinert H., Ochrona gleb, Wydawnictwo Politechniki Zielonogórskiej, Zielona Góra, 1998. Gworek B (red), Technologie rekultywacji gleb, Wydawnictwo Naukowe Gabriel Borowski, Warszawa 2004
Supplementary literature	Szyc J., Odcieki ze składowisk odpadów komunalnych, Wydawnictwo Naukowe Gabriel Borowski, Warszawa 2003 Olszanowski A. (red.), Remediacja i bioremediacja zanieczyszczonych wód i gruntów oraz wykorzystanie modelowania i technik informatycznych w inżynierii, Wydawnictwo Politechniki Poznańskiej, 2001
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

not specified

Work placement

Not applicable