KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

Course title	ECTS code
Technology of soil remediation	13.3.0387

Name of unit administrating study

null

Studies

faculty	field of study		
Wydział Chemii	Chemia	type	drugiego stopnia
		form	stacjonarne
		specialty	chemia i technologia środowiska
		specialization	wszystkie

Teaching staff

prof. dr hab. inż. Adriana Zaleska-Medynska; dr Joanna Drzeżdżon; mgr Magdalena Miodyńska; dr hab. inż. Ewelina Grabowska-Musiał; dr inż. Anna Gołąbiewska; dr inż. Aleksandra Pieczyńska; dr inż. Joanna Nadolna

Forms of classes, the realization and number of hours

Forms of classes

Laboratory classes, Lecture

The realization of activities

classroom instruction

Number of hours

Lecture: 15 hours, Laboratory classes: 15 hours

ECTS credits

2
classes 30 h
tutorial classes 5 h
student's own work 15 h
TOTAL: 50 h - 2 ECTS

The academic cycle

2022/2023 summer semester

Type of course

obligatory

Language of instruction

polish

Teaching methods

- conducting experiments
- multimedia-based lecture

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

Graded credit

Assessment methods

- written exam with open and test questions
- (mid-term / end-term) test
- graded course credit based on individual grades obtained during the semester

The basic criteria for evaluation

written test: a positive grade of the written test consisting of open questions covering the issues listed in the program content of the lecture and laboratory exercises the grade scale according to the UG Study Regulatory
- oral examination - supplement to the written test, but only for those students who obtained 40-50% of points possible to receive from the written credit,
Laboratory exercises:
- average of grades obtained from laboratory exercises and the final test, the scale is in accordance with the University of Gdańsk Studies Regulations. Obtaining above 51% of points from laboratory exercises, i.e.: entrance tests covering the subject of performed experiments, preparation of the experimental part, preparation of results obtained in the experimental part (reports), activity and cooperation in the group, and compliance with the principles of work safety in the chemical laboratory and obtaining over 51% of points from the final test covering the abovementioned scope

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

basic chemistry, inorganic chemistry, organic chemistry, analytical chemistry, physical chemistry

B. Prerequisites

Basic knowledge of basic chemistry, organic chemistry and physical chemistry, as well as basic knowledge of chemical analysis methods

Aims of education

- Introduce students with all issues listed in the lecture program content.
- Introduce students with the main stages of the technological process used to remediate contaminated soils.
- Introduce students with techniques of instrumental analysis.
- Developing the skill of making independent calculations necessary for the correct interpretation of the results of analyzes
- Developing the skill of independently choosing the appropriate remediation technique for a given goal

Course contents

A. Problems of the lecture:

Sources, types of pollution. Characteristics of impurities: 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 pollution in water and soil (chemical, biochemical and photochemical processes). Impact of pollution on physical and mechanical properties of soils. Soil remediation - 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 methods for groundwater treatment. Sealing methods for landfills and types of insulation layers.

B. Problems of laboratory exercises:

Basics of laboratory work, performance of thematic exercises related to the removal of contaminants from contaminated soils

Bibliography of literature

A.1. wykorzystywana podczas zajęć

Kowalik P., Ochrona środowiska glebowego, PWN, Warszawa, 2001.

Zadroga B., Olańczuk-Neyman K., Ochrona i rekultywacja podłoża gruntowego, Wydawnictwo Politechniki Gdańskiej, 2001.

A.2. studiowana samodzielnie przez studenta

Greinert H., Ochrona gleb, Wydawnictwo Politechniki Zielonogórskiej, Zielona Góra, 1998.

Gworek B (red), Technologie rekultywacji gleb, Wydawnictwo Naukowe Gabriel Borowski, Warszawa 2004

B. Literatura uzupełniająca

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.

The learning outcomes (for the field of study and specialization)

Knowledge

1.The student defines the basics of risk assessment of the spread of pollution in the environment and the threat arising from soil pollution.
2. Understands the relationship between the structure and properties of a chemical compound and its behavior in the environment
3. Understands the relationship between the properties of pollution, the properties of soil particles, and the choice of remediation technology for contaminated soils
4. Is able to assess the exposure of individual components of the environment to the presence of chemical compounds depending on the manner and scale of their use
5. Lists and classifies technologies used for soil remediation
6. Distinguishes and characterizes individual soil remediation technologies used in in-situ and ex-situ

Skills

1. Classifies types and sources of pollution
2. Demonstrates the ability to perform basic physicochemical and technological measurements important for removing contaminants from the soil environment
3. Plans and develops technologies for remediation of contaminated land
4. Plans and conducts simple experiments in the field of environmental remediation technologies.
5. Talks about issues of environmental remediation technology in understandable language, using the correct nomenclature.
6. Evaluates selected properties of contaminated soils and assesses the effectiveness of remediation of contaminated soils (by bioremediation and washing)

Social competence

1. Classifies types and sources of pollution

	2. Demonstrates the ability to perform basic physicochemical and technological measurements important for removing contaminants from the soil environment 3. Plans and develops technologies for remediation of contaminated land 4. Plans and conducts simple experiments in the field of environmental remediation technologies. 5. Talks about issues of environmental remediation technology in understandable language, using the correct nomenclature. 6. Evaluates selected properties of contaminated soils and assesses the effectiveness of remediation of contaminated soils (by bioremediation and washing)

Contact

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