KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

Course title	ECTS code
Chemistry of environmental pollutants	13.3.1162

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

dr hab. Łukasz Haliński; dr hab. Anna Białk-Bielińska, profesor uczelni; prof. dr hab. Piotr Stepnowski; dr hab. Magda Caban, profesor uczelni; prof. UG, dr hab. Monika Paszkiewicz; dr Joanna Dołżonek

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: 30 hours, Laboratory classes: 30 hours

ECTS credits

4
classes 60 h
tutorial classes 20 h
student's own work 20 h
TOTAL: 100 h - 4 ECTS

The academic cycle

2023/2024 winter 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
- Examination

Assessment methods

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

The basic criteria for evaluation

C. The basic criteria for evaluation or exam requirements

Lecture:

• pass the exam with open and closed questions concerning the whole course content

91-100%: 5.0
81-90%: 4.5
71-80%: 4.0
61-70%: 3.5
51-60%: 3.0
Less than 51% 2.0

Laboratories:

• completed all tests

91-100%: 5.0
81-90%: 4.5
71-80%: 4.0
61-70%: 3.5
51-60%: 3.0
Less than 51% 2.0

The final grade will be calculated as a weighted average of the results of the final test covering all topics from the lab classes (40%), single tests from each class (40%) and laboratory reports (20%)

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

Inorganic chemistry, organic chemistry, analytical chemistry, physical chemistry.

B. Prerequisites

Knowledge on the chemical structure and physicochemical properties of basic classes of organic and inorganic compounds. Basic skills in the chemical nomenclature, stoichiometry and its application, calculations of concentrations of compound solutions. Skills in using the laboratory glassware and basic analytical equipment. Knowledge on basic safety rules in the chemical laboratory.

Aims of education

• To provide students a clear understanding of the most important issues in the chemistry of environmental pollutants
• To familiarize students with the basic types of environmental pollutants, their transport, environmental fate and transformations
• To introduce students to principles of prediction of environmental fate of selected classes of pollutants
• To learn students how to independently estimate environmental risks associated with the use of certain substances basing on their chemical structure

Course contents

A. Topics of the lecture: Chemical pollution of the environment. Chemistry and physics of interaction of chemicals with components of environment. Environmental fate of selected pollutants: transport, stability and degradation. Global effects caused by the chemical pollution. Basic principles of environmental fate assessment of chemicals basing on structure-activity relationship.

B. Topics of lab classes: Determination of selected physicochemical parameters of pollutants using traditional and instrumental techniques.

Estimation of the impact of environmental conditions on environmental fate of chemicals. Determination of adsorption rate of chemicals to soils.

Bibliography of literature

Literature required to pass the course
A.1. literatur used during classes:
Alloway B.J., Ayres D.C. Chemiczne podstawy zanieczyszczania środowiska, PWN, Warszawa, 1999.
Manahan S.E. Toksykologia środowiska. Aspekty chemiczne i biochemiczne, PWN, Warszawa, 2010.
Van Loon G.W., Duffy S.J. Chemia środowiska, PWN, Warszawa, 2008.
A.2. Literature for individual studies:
Manahan S.E. Toksykologia środowiska. Aspekty chemiczne i biochemiczne. PWN, Warszawa, 2010.
Van Loon G.W., Duffy S.J. Chemia środowiska. PWN, Warszawa, 2008.
Witkiewicz Z. Podstawy chromatografii. Wydawnictwa Naukowo-Techniczne, Warszawa, 2005.
Stepnowski P., Synak E., Szafranek B., Kaczyński Z. Monitoring i analityka zanieczyszczeń w środowisku. Wydawnictwo UG, 2010.
Extracurricular readings
Piotrowski J.K. (red.) Podstawy toksykologii. Kompendium dla studentów szkół wyższych. wyd. 2, WNT, Warszawa, 2008.
Pigon K. Chemia Fizyczna tom I. Wydawnictwo PWN, Warszawa, 2005.

Atkins P.W. Chemia fizyczna. PWN, Warszawa, 2001.

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

Knowledge

Students define basic terms associated with risk assessment and chemical hazards.
Students understand importance of structure-activity relationship of a substance in determining its environmental fate.
Students are able to estimate the exposition of certain environment components on pollutants in association with the amounts of chemicals emitted and the way they are used.
Students identify some characteristic types of the chemical structure that are responsible for certain physiochemical properties and biological activity.
Students understand and characterize selected global effects, associated with the presence of chemical compounds in the environment.

Skills

Social competence

Students understand the need of life-long learning in pollutant-related topics.
Students show creativity in independent and team work.
Students are able to estimate the impact of human activity on natural environment, in local and global scale, in a conscious way.
Students are responsible for their own safety and safety of their co-workers; they are keeping safety measures when working with chemicals and analytical instruments.

Contact

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