KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
EUROPEJSKI FUNDUSZ SPOŁECZNY

| Course title | ECTS code |
|---|---|
| Environmental chemistry | 13.3.0905 |

**Name of unit administrating study**

null

**Studies**

| faculty | field of study | | |
|---|---|---|---|
| Wydział Chemii | Chemia | type | pierwszego stopnia |
| | | form | stacjonarne |
| | | specialty | analityka i diagnostyka chemiczna, chemia żywności |
| | | specialization | wszystkie |

**Teaching staff**

prof. dr hab. Piotr Stepnowski; dr hab. Anna Białk-Bielińska, profesor uczelni; dr Ewa Mulkiewicz; 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**

3
classes - 60 h
tutorial classes – 5 h
student's own work – 10 h

Total: 75 h - 3 ECTS

**The academic cycle**

2024/2025 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

**Assessment methods**

- (mid-term / end-term) test
- assignment work – completing a specific practical assignment
- graded course credit based on individual grades obtained during the semester

**The basic criteria for evaluation**

The assessment will be the weighted average of the final colloquium scores of the entire laboratory exercise material (40%), the partial tests (40%) and the reports (20%). Negative scores can be improved by an additional colloquium of material covering the whole range of exercises (min. 51% of the points available).
Evaluation criteria in accordance with the UG Study Regulations.

**Method of verifying required learning outcomes**

**Required courses and introductory requirements**

**A. Formal requirements**

none

**B. Prerequisites**

Knowledge of the basics of general, inorganic, organic and analytical chemistry, including: structure and physicochemical properties of basic groups of organic and inorganic compounds, knowledge of chemical nomenclature, ability to apply basic stoichiometry formulae, calculation of solution concentrations, knowledge and ability to use laboratory glass, operation of basic measuring instruments, application of the principles of work safety in a chemical laboratory.

**Aims of education**

- To acquaint the student with basic issues of environmental chemistry, including chemical processes occurring in its various components;
- To acquaint students with the main environmental pollutants of natural and anthropogenic origin;
- Developing skills to assess the exposure of various elements of the environment to the presence of chemical compounds along with the effects of this presence;
- To acquaint students with methods of preventing harmful effects of chemical compounds in the environment;
- Developing skills of self-assessment of factors important for chemical processes taking place in the environment.

## Course contents

Basic problems of chemical compounds presence in the environment as well as chemical processes occurring in various components of the environment, i.e. water, soil and atmosphere, e.g. adsorption to soil, heavy metals mobility in soil, corrosion, methods of removing chemical compounds from natural waters; determination of physicochemical parameters of the environment chemistry.

## Bibliography of literature

Literature required to pass the course

Stephen J. Duffy Chemia środowiska PWN Wydawnictwo Warszawa 2006,
Stanley E. Manahan Toksykologia środowiska - aspekty chemiczne i biochemiczne, PWN Wydawnictwo Warszawa 2006,

Extracurricular readings

Stanley E. Manahan, Fundamentals of Environmental Chemistry, CRC Press, 2011

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

### Knowledge

1. the student correctly solves the tests and answers the open questions concerning the knowledge of environmental chemistry;
The student 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;
Identifies preventive actions of harmful influence of selected chemical compounds on various components of the environment;
4. understands the dependencies related to ecotoxicity of selected environmental contaminants and describes the methods used for its assessment.

### Skills

1. demonstrate the ability to plan and perform basic physico-chemical measurements and experiments relevant to the chemical processes taking place in the environment
2. analyses aspects related to the negative impact of anthropogenic environmental pollution on various engineering and technological processes;
3. is able to propose solutions to reduce the occurrence of harmful chemical compounds in the environment;
4. is able to indicate and describe the effects related to the presence of a chemical compound in the environment, using the results of experiments and literature data;
5. discusses environmental chemistry in clear language, using appropriate nomenclature.

### Social competence

In the course of developing the results of the experiments carried out during the classes, the student is able to define gaps in his knowledge and to fill them by searching and quoting literature on the subject, thus understanding the need for further education;
During laboratory classes, the student demonstrates creativity in both independent and team work;
3. consciously assesses the impact of human activities on the environment, at the local and global level;
4. is responsible for the safety of his or her own work and that of others: is cautious in the handling of chemical substances, is cautious in the handling of measuring instruments.

## Contact

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