KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

Course title	ECTS code
Chemical analysis of biologically active compounds	13.3.0452

Name of unit administrating study

null

Studies

faculty	field of study		
Wydział Biologii	Przyroda	type	wszystkie
		form	wszystkie
		specialty	wszystkie
		specialization	wszystkie
Wydział Chemii	Chemia	type	pierwszego stopnia
		form	stacjonarne
		specialty	chemia biomedyczna, chemia kosmetyków
		specialization	wszystkie

Teaching staff

dr hab. Piotr Mucha, profesor uczelni; dr hab. Anna Łęgowska, profesor uczelni; dr Agata Gitlin-Domagalska; dr Natalia Ptaszyńska; dr hab. Jarosław Ruczyński; prof. UG, dr hab. Dawid Dębowski

Forms of classes, the realization and number of hours

Forms of classes

Laboratory classes, Lecture

The realization of activities

classroom instruction

Number of hours

Laboratory classes: 45 hours, Lecture: 15 hours

ECTS credits

4
classes 60 h
tutorial classes 5 h
student's own work 35 h
TOTAL: 100 h - 4 ECTS

The academic cycle

2024/2025 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

Lecture:
• written exam with open questions
Laboratory classes:
•continuous assessment of student participation and involvement in laboratory classes, quality of work and written presentation of obtained results (reports);
•preliminary tests;
•final grade would be determined as average of partial grades received during the semester;

The basic criteria for evaluation

	Assessment criteria in accordance with the UG Studies Regulations Lecture: • Continuous assessment of preparation and activity in the classroom • positive evaluation of the written exam consisting of 6-12 open questions covering issues mentioned in the subject curriculum contents; answers to the questions will require solving tasks related to the assumed effects of education; the grading scale will be adjusted to the rating range of the assessed written work. • the condition to take the exam is to get credit for laboratory exercises Laboratory classes: positive grade received in 7 preliminary testes, that check knowledge required to perform experiments during the classes; accomplishment of all planned experimental work (quality of laboratory work, ability to team work and mode of work would be graded); analysis of obtained results performed as written report; • to complete the laboratory course each negative grade must be improved.

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

organic chemistry for the first degree students

B. Prerequisites

basic knowledge of organic chemistry, ability to work in a chemical laboratory, knowledge of basic laboratory glass, assimilation of working principles in a chemical laboratory

Aims of education

- familiarize students with all the issues mentioned in the lecture's program content,
- acquainting students with the basics of UV/Vis spectroscopy and spectrofluorimetry and their use in the analysis of biologically active compounds
- acquainting students with chromatographic and electrophoretic methods of analysis of peptides, proteins and nucleic acids
- teaching students to perform chemical experiments independently (using descriptions included in the instructions)
- to develop the skills of critical evaluation and interpretation of the obtained experimental results and analysis of source texts

Course contents

A. Issues of the lecture

Characteristics of electromagnetic radiation. The laws of absorption. Application of UV and VIS spectroscopy. Basics and application of fluorescent methods. Basics of chromatography theory. Characteristics and application of basic chromatographic techniques in the separation of biomolecules. Types of detectors used in chromatography. Basics of gel electrophoresis. Characteristics of basic electrophoretic techniques. Electrophoresis of proteins and nucleic acids. Capillary electrophoresis.

B. Laboratory classes : completion of seven experiments related to the isolation and chemical analysis of natural compounds, such as saccharides, lipids, alkaloids, vegetable dyes, vitamins, proteins and nucleic acids, using spectroscopic, chromatographic and electrophoretic techniques

Bibliography of literature

Literature required to pass the course
Cygański W, Metody spektroskopowe w chemii analitycznej
Witkiewicz Z, Podstawy chromatografii
Stryer L, Biochemia
Kłyszejo-Stefanowicz L, Ćwiczenia z biochemii

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

Knowledge

1.Defines and presents the chemical structure of basic groups of biomolecules, explains their importance for the functioning of living organisms
2. defines the laws of absorption, knows their importance in the spectrometric analysis of biomolecules
3. characterizes the basic spectroscopic techniques used in the identification and quantitative analysis of biologically active compounds
4. defines the basic concepts from the theory of chromatography and electrophoresis
5. classifies specific chromatographic and electrophoretic techniques and its ability for analysis of biomolecules with specific physicochemical properties
6. recognizes and is able to use basic laboratory equipment

Skills

1. Uses chemical terminology to the extent necessary to present (in written and oral

	form) the content of the subject 2. anticipates the course of reactions of metabolic pathways and products of these transformations 3. predicts physicochemical and biological properties of organic compounds based on their chemical formulas 4. uses the basic analytical techniques used in the analysis of endogenous organic compounds 5. designs and performs simple biochemical experiments, selecting laboratory equipment in accordance with its intended use 6. analyzes the results of experiments conducted, draws conclusions about the correctness of their course
	Social competence
	Student 1. Understands the need for continuous education, 2. takes care of the laboratory equipment entrusted 3. is prudent in using laboratory equipment and working with chemical reagents 4. appreciates the need to work in a team in accordance with its role (group manager / group member) 5. is aware of the need for a critical analysis of his own work 6. shows cautious criticism in receiving information, particularly available in the mass media 7. is aware of the need for honest and reliable work

Contact

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