KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

Course title	ECTS code
Biochemistry	7.2.0605

Name of unit administrating study

null

Studies

faculty	field of study		
Wydział Chemii	Ochrona środowiska	type	pierwszego stopnia
		form	stacjonarne
		specialty	wszystkie
		specialization	wszystkie

Teaching staff

prof. dr hab. Krzysztof Rolka; dr hab. Jarosław Ruczyński; dr Natalia Ptaszyńska; dr hab. Anna Łęgowska, profesor uczelni

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: 30 hours

ECTS credits

4
classes - 45 h
tutorial classes – 15 h
student's own work – 40 h

Total: 100 h - 4 ECTS

The academic cycle

2024/2025 winter semester

Type of course

obligatory

Language of instruction

polish

Teaching methods

- Problem-solving tutorials
  Laboratory experiments
- 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

The basic criteria for evaluation

The basic criteria for evaluation or exam requirements
• positive grade received in written exam composed of 5-10 open questions covering issues listed in the course contents; answers to these questions will require solving tasks specified in educational outcomes; the grading scale would be adjusted to the range of all rated exams
• to take the exam both the laboratory classes and tutorials must be passed;
Tutorials:
• passing two written colloquiums covering: (1) chemical structures and properties of amino acids, peptides and proteins (2) chemical structure and properties of monosaccharides, polysaccharides, lipids, cell membranes and nucleic acids;
• each negative grade should be improved at repeat colloquium.
Laboratory classes:
• positive grade received in 3 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 (bachelor level)

B. Prerequisites

Fundamentals of organic chemistry, skills to work in a chemical laboratory, knowledge of basic laboratory glassware, learning the principles of work in a biochemical laboratory

Aims of education

Aims of education

• to acquaint students with all issues mentioned in the lecture contents;
• to introduce students to the basic endogenous organic compounds, their structure and functions;
• to acquaint students with basic metabolic pathways and relations between them;
• to teach students how to perform biochemical experiments using delivered instructions;
• to develop the ability to critically asses and interpret obtained experimental results and analysis of scientific sources.

Course contents

A. Lecture: Energy-rich compounds, thermodynamics of biochemical reactions. Classification, structures and functions of enzymes. Mechanisms of enzyme catalysis. Carbohydrates, lipids and proteins – structures and functions. Biological membranes – structure and functions. Metabolic pathways: glycolysis, gluconeo-genesis, pyruvate decarboxylation, Krebs cycle, oxidative phosphorylation, glycogen metabolism, fatty ac-ids metabolism, amino acids metabolism, pentose phosphate pathway. Proteins G and signal transduction. Photosynthesis. DNA and RNA: replication, transcription, translation, PCR. Basics of genetic engineering.
B. Tutorial: Chemical structure, physicochemical properties and biological functions of peptides, proteins, nucleic acids, phospholipids, mono- and polysaccharides.
C. The lab: completion of five experiments with the following topics: determination of activity of serine proteinases and their inhibitors using chromogenic substrates, determination of kinetic parameters of select-ed chromogenic substrate, separation of proteins by size-exclusion chromatography, phospholipid analysis by thin layer chromatography, determination of polysaccharides susceptibility to hydrolysis in low pH

Bibliography of literature

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Literature required to pass the course
J. M. Berg, J. L. Tymoczko, L. Stryer, „Biochemia”, PWN, Warszawa 2009
Monographic works provided by assistants leading classes
Extracurricular readings
Various academic handbooks concerning biochemistry

The learning outcomes (for the field of study and specialization)	Knowledge
	Skills
	Social competence

Contact

krzysztof.rolka@ug.edu.pl