University of Gdańsk

Subject card

Subject name and code	Introduction to biochemistry, PG_00147021						
Field of study	Genetics and Experimental Biology						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	undergraduate studies		Subject group		Obligatory subject group in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
Learning profile	academic		Assessment form				
Conducting unit	Pracownia Biochemii Mikroorganizmów -> Katedra Biochemii Ogólnej i Medycznej -> Faculty of Biology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Karolina Stojowska-Swędrzyńska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		3.0		17.0	50
Subject objectives	The aim of the exercises is to familiarize students with the structure and function of macromolecules (nucleic acids, proteins, sugars, lipids) and with laboratory biochemical techniques used to analyze macromolecules and biochemical processes. An additional goal is for students to acquire the ability to independently perform biochemical experiments and interpret the results.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GBEL3_U03] Proficient in using research equipment and tools, while following the correct sequence of procedures, to conduct basic physical, biological, or chemical observations and measurements in laboratory work within the field of biological sciences.	The student uses basic research equipment and tools and, maintaining the correct sequence of activities, performs simple biochemical and physical observations and measurements in laboratory work in the field of biological sciences.	[SU2] presentation/project/paper/ report
[GBEL3_U08] Independently study literature and plan one's own career path.	The student is able to independently study literature and plan his or her own career path.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
[GBEL3_K05] Responsibility for the safety of one's own work and others.	The student is responsible for the safety of his own work and that of others and is able to recognize hazardous situations and take appropriate actions.	[SK8] observation of student's independent or team work
[GBEL3_W01] Understanding the structure and properties of basic types of biological macromolecules, molecular mechanisms of metabolic pathways and genetic information flow, as well as sources of genetic variability in organisms and mechanisms of evolution; explaining the rules of inheritance, elucidating differences in the structure and functioning of prokaryotic and eukaryotic cells, and understanding the structure and functional relationships at the cellular and tissue levels.	The student describes the structure, properties and functions of basic types of biological macromolecules and the mechanisms of biochemical methods.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[GBEL3_U01] Independently perform practical tasks in the field of biological sciences and related disciplines, formulate research problems, analyze their results, and draw conclusions.	The student independently performs practical tasks in the field of biological and related sciences, is able to formulate research problems, analyze their results and draw conclusions.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
[GBEL3_K08] Responsibility for entrusted equipment/materials and respect for the work of others.	The student is responsible for the provided laboratory equipment, instruments, materials and reagents. He is responsible for his own work and respects the work of others.	[SK8] observation of student's independent or team work

Subject contents

- Structure, function and properties of basic macromolecules: nucleic acids, proteins, carbohydrates, lipids.
- Methods of separation and analysis of nucleic acids and proteins (agarose and polyacrylamide electrophoresis).
- Methods of identification and analysis of biochemical properties of selected macromolecules.- Methods of separating molecules due to differences in molecular weight (molecular filtration).
- Structure and functions of enzymes, methods of determining enzymatic activity, enzyme inhibition.
- Chromatographic methods (thin layer chromatography, paper chromatography).

Prerequisites and co-requisites

Completion of courses covering general and organic chemistry. Knowledge of the structure of basic inorganic and organic compounds, isomerism, chemical bonds, mechanisms of basic chemical reactions, energetics of chemical reactions, hydrophobic interactions, acids and bases, pH, units of measurement, solution concentration units, ability to calculate solution concentrations.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written reports of laboratory experiments	50.1%	30.0%
Test with closed and open questions	50.1%	70.0%

Recommended reading

Basic literature

- Instructions for laboratory classes (provided by the laboratory coordinator) (in Polish)

	Supplementary literature	(Textbooks in Polish): • Berg J. M., Tymoczko J. L., Stryer L. 2017. Biochemia. PWN, Warszawa • Berg J. M., Stryer L. , Tymoczko J. L., Biochemia. Krótki kurs. PWN Warszawa 2013 • Kłyszejko-Stefanowicz L. (red.). 2005. Ćwiczenia z biochemii. PWN, Warszawa • Hames B. D., Hooper N.M. 2007. Krótkie wykłady: Biochemia. PWN, Warszawa
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Differences in the structure of RNA and DNA, characteristic features of plasmid DNA, amino acid structure, what is the isoelectric point, what is molecular filtration, what is the active center of the enzyme, list the differences between competitive and non-competitive inhibition, What is the Biuret reaction used for, what is an amphiphilic molecule.	
Work placement	Not applicable	

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