University of Gdańsk

Subject card

Subject name and code	Chemical analysis of biologically active compounds, PG_00081938		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	Bachelor's 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	4	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Piotr Mucha	
	Teachers	dr hab. Piotr Mucha dr hab. Jarosław Ruczyński	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15	2.0	8.0	25

Subject objectives	to familiarize students with the basic issues of interaction of electromagnetic radiation with matter, the basics of UV-Vis spectrometry and spectrofluorimetry and their use in the analysis of selected biologically active compounds- to familiarize students with the physicochemical properties and possibilities of separation of peptides, proteins and nucleic acids by chromatographic and electrophoretic methods- to develop the ability to critically evaluate and interpret the obtained experimental results and analyze source texts

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEML3_W04] Characterises the basic methods of chemical compound analysis.	- predicts the physicochemical properties and selected groups of biologically active compounds based on their structure and their effect on the environment	[SW4] test/exam - oral or written
[CHEML3_K02] Works individually demonstrating initiative and independence of activity and cooperates in a team fulfilling various roles in it.	-understands the need for continuous and systematic education -appreciates the need to be able to work in a team by discussing and proposing their own solutions to the problem questions posed	[SK4] test/exam - oral or written
[CHEML3_U03] Selects the appropriate equipment and laboratory apparatus for conducting uncomplicated chemical experiments.	- analyzes the results of conducted experiments, draws conclusions about the regularity of their course	[SU4] test/exam - oral or written
[CHEML3_U02] Performs analyses using experimental methods and draws conclusions based on them.	- is able to propose the use of a specific separation technique for the analysis of selected biologically active compounds	[SU4] test/exam - oral or written
[CHEML3_U01] Identifies, analyses and solves problems in the field of broadly understood chemistry on the basis of the acquired knowledge.	shows cautious criticism in accepting information, especially that available in the mass media	[SU4] test/exam - oral or written
[CHEML3_U07] Prepares documented elaboration on a specific problem in the field of selected chemical and physical issues.	analyzes the results of conducted experiments, draws conclusions about the correctness of their course	[SU4] test/exam - oral or written
[CHEML3_K05] Observes established procedures in laboratory work and is responsible for the safety of her/his and others' work.	takes due care in handling laboratory equipment and in working with chemical reagents	[SK4] test/exam - oral or written
[CHEML3_W10] Enumerates and describes the basic aspects of the construction, operation and use of measuring apparatus and equipment used in experimental works in the field of chemistry and related sciences.	designs and performs simple biochemical experiments, selecting laboratory equipment according to its purpose	[SW4] test/exam - oral or written

Subject contents

Characterization of electromagnetic radiation, laws of absorption, fundamentals and application of UV-Vis spectroscopy, fundamentals and application of fluorescence, fundamentals, characterization and application of basic chromatographic techniques, fundamentals of gel electrophoresis, characterization of basic electrophoretic techniques, electrophoresis of proteins and nucleic acids

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
credit	50.0%	100.0%

Recommended reading

Basic literature

J. M. Berg, J. L. Tymoczko, L. Stryer, Biochemia, PWN, Warszawa 2009.

Szczepaniak W. Metody instrumentalne w analizie chemicznej

Witkiewicz Z., Podstawy chromatografii, WNT, 2000,

	Supplementary literature	Kołodziejczyk A., Naturalne związki organiczne Kłyszejko-Stefanowicz L., Ćwiczenia z Biochemii
	eResources addresses	
Example issues/ example questions/ tasks being completed	A gene encoding a growth hormone (HW) protein was implanted into a bacterial cell. The sequence of the gene was modified in such a way that an additional sequence (called Tag) of six histidine residues (His6) was added to the C-terminus of the protein. Suggest the most efficient method and conditions to isolate this protein from a mixture of other cellular proteins by cell lysis. What feature of this protein will be used for isolation? What feature of the protein can be used for this isolation? Draw the effect of the separation.	
Work placement	Not applicable	

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