University of Gdańsk

Subject card

Subject name and code	Monographic lecture - Peptides and proteins in science and industry, PG_00082462						
Field of study	Chemical Business						
Date of commencement of studies	February 2025		Academic year of realisation of subject	2025/2026			
Education level	Master's studies		Subject group	Obligatory subject group in the field of study Optional subject group			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	1		Language of instruction	Polish			
Semester of study	2		ECTS credits	3.0			
Learning profile	academic		Assessment form	credit			
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Elżbieta Kamysz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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		20.0		25.0	75
Subject objectives	Familiarize students with the issues mentioned in the lecture's program content.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BCHMU2_W05] Knows and understands the main trends in the development of chemistry combined with economics as two interpenetrating scientific disciplines.	Student presents the structure of peptides and proteins, knows the rules for naming peptides, is able to characterize the main techniques for obtaining and purifying peptides and proteins, compares different methods of peptide synthesis, knows the basic databases on the subject of peptides and proteins, knows and understands the possibilities of using peptides and proteins for scientific and industrial purposes, lists applications of peptides and proteins in medicine, pharmacy, cosmetology and food industry.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[BCHMU2_K04] Is willing to properly assess the acquired knowledge, respect and disseminate it in order to solve specific cognitive and practical issues.	Student understands the need to learn about peptides and proteins, is careful in dealing with chemical substances (strong acids, alkalis, condensing agents and others); can predict and properly plan the necessary personal protective equipment.	[SK2] presentation/project/paper/ report [SK4] test/exam - oral or written
[BCHMU2_W01] Knows and understands complex physicochemical processes and is able to analyse their course in connection with other fields of science.	Student in a clear way, both in speech and in writing, presents correct reasoning regarding protein and peptide chemistry; recognizes the basic equipment used for the synthesis and purification of peptides and can select the appropriate equipment for carrying out chemical experiments and properly plan the necessary personal protective equipment. Student draws attention to the harmfulness of chemical reagents to humans and the environment when designing the synthesis and purification of peptides and proteins	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[BCHMU2_U02] Is able to define her/his interests, develop them within the chosen direction and in connection with the subject of her/ his master's thesis by implementing the process of self-education and planning her/his professional career.	Student recognizes the fundamental role of peptides and proteins in the life of humans and mammals.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
[BCHMU2_U01] Is able to, on the basis of her/his knowledge, propose a solution to problems in chemistry, taking into account the economic aspect by using advanced measurement techniques.	Student is able to propose a strategy and tactics for the synthesis of peptides depending on their purpose.	[SU4] test/exam - oral or written

Subject contents

Structure of the peptide bond and the structures of peptides and proteins; division of peptides and proteins; nomenclature and stereochemistry of peptides; methods of obtaining peptides on a laboratory and industrial scale; techniques for isolating and purifying peptides and proteins; a database of proteins and bioactive peptides; structure and importance of peptides and proteins in medicine, pharmacy, cosmetology and food industry (e.g. peptide drugs, peptide cosmetics ingredients, biologically and functionally active peptides, bioactive sequences derived from food proteins, etc.)

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
presentation	51.0%	30.0%
written assessment in the test form (closed and a few open questions)	51.0%	70.0%

Recommended reading

Basic literature

- Aminokwasy, peptydy, białka, H. D. Jakubke, H . Jeschkeit.(PWN).
- Peptides: Chemistry and Biology, N. Sewald H. D. Jakubke, (WILEY-VCH)
- Biologicznie aktywne peptydy i białka żywności, J. Dziuba, Ł. Fornal (WNT)
- Fmoc Solid Phase Peptide Synthesis, W. Chan and Peter White, Oxford University Press, U.S.A.
- Białka i peptydy, S. Doonan. (PWN);
- Artykuły naukowe prezentujące zagadnienia zawarte w treściach programowych przedmiotu.

	Supplementary literature	• Principles of Peptide Synthesis, M. Bodanszky, Springer-Verlag, Berlin Heilderberg; • The World of Peptides, T. Wieland, M. Bodanszky, Springer-Verlag, Berlin Heidelberg; • Chemia organiczna, R. T. Morrison, R.N. Boyd.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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