



Subject card

Subject name and code	BIOLOGICALLY ACTIVE COMPOUNDS OF NATURAL ORIGIN, PG_00063487						
Field of study	Biotechnology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Optional subject group Specialty subject group Subject group related to scientific research in the field of study		
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		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department Of Pharmaceutical Technology And Biochemistry -> Faculty Of Chemistry -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Piotr Szweda				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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		2.0		18.0	50
Subject objectives	<p>The aim of the course is to acquaint the Student with the knowledge concerning:</p> <ol style="list-style-type: none">- an ideal research scheme for biologically active compounds.- isolation methods of biologically active compounds of pharmaceutical importance (such as plant metabolites or antibiotics) and quality control of the implemented procedures.- molecular structures of selected natural compounds and the relationship between their structure and biological activity (SAR).- selected groups of chemical compounds that determine the pharmacological properties and the use of plant substances and preparations in medicine.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U04] predicts the interaction of biomolecules and biologically active compounds on living organisms and the course of processes involving them based on knowledge in biology, biotechnology and related fields and computer methods of data analysis, modeling and simulation		The student understands the structure-activity relationship for biologically active compounds and is able to pre-design new molecules with desired properties		[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K7_K01] understands the need to constantly update knowledge based on the state of the art in accordance with the latest scientific literature, improve professional skills and the importance of teamwork		The student understands the need to deepen knowledge based on available professional literature. The student knows the databases in which scientific publications are deposited.		[SK2] Assessment of progress of work		
	[K7_W02] explains the structure and function of biomolecules and the methods and instruments for determining their quantity and activity		the student knows the basic classes of natural compounds and their structural elements that determine biological activity		[SW1] Assessment of factual knowledge		

Subject contents	Lecture: <ol style="list-style-type: none">- Research on natural compounds - introduction and research methods (observation, isolation, identification or structure elucidation, biosynthesis, chemical ecology).- Medicines of plant origin. Herbal preparations used in medicine. Detailed characteristics (occurrence, chemistry, pharmacological properties and use in medicine) of selected groups of plant metabolites.- Antibiotics of natural origin. Detailed characteristics of a selected group of compounds.- Methods of identification (TLC, HPLC, HPLC-MS) and isolation of biologically active compounds (prepTLC, FLASH, prepHPLC, CPC and HSCCC). Lab: <ol style="list-style-type: none">- Obtaining of plant preparations (i.e. extraction, hydrodistillation in the Deryng/Clevenger apparatus).- Qualitative assessment of natural compounds (antibiotics, plant metabolites) using the methods described in the Polish Pharmacopoeia, i.e. TLC, HPLC, LC-MS, UV-Vis.- Modern methods of isolation of selected biologically active compounds from biological material (prepHPLC, FLASH, CPC).- Quality control of the methods used (HPLC-MS, UV-Vis, etc.)		
Prerequisites and co-requisites	Organic chemistry and analytical chemistry.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	60.0%	50.0%
	Laboratory	60.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none">- Naturalne związki organiczne. (A. Kołodziejczyk, Wydawnictwo Naukowe PWN, 2022)- Farmakopea Polska XII 2020. Farmakognostyczne metody badania. Monografie szczegółowe substancji i przetworów roślinnych. Monografie narodowe substancji i przetworów roślinnych.	
	Supplementary literature	<ol style="list-style-type: none">- Chromatografia cieczowa. Teoria i praktyka. (Z. Witkiewicz, W. Wardencki, I. Malinowska, Wydawnictwo Naukowe PWN, 2019)	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none">• Predicting the spectroscopic properties of the given molecules.• Choosing an optimal isolation method for a given structure.• Establishing of a role of a given structure in the environment.		
Work placement	Not applicable		

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