GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Biologically Active Compounds of Natural Origin, PG_00058273		
Field of study	Biotechnology		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	Optional 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	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Szczeblewski	
	Teachers	dr inż. Paweł Szczeblewski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

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	45	2.0	28.0	75

Subject objectives

The aim of the course is to acquaint the Student with the knowledge concerning:

1. - an ideal research scheme for biologically active compounds.
2. - isolation methods of biologically active compounds of pharmaceutical importance (such as plant metabolites or antibiotics) and quality control of the implemented procedures.
3. - molecular structures of selected natural compounds and the relationship between their structure and biological activity (SAR).
4. - 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_W02] has advanced knowledge of structure and activity of enzymes and biologically active compounds also in pharmacological context, knows basic instrumental methods of qualitative and quantitative analysis and activity studies of biomolecules		[SW1] Assessment of factual knowledge
[K7_U04] is able to predict potential properties of biomolecules and biologically active compounds on the basis of knowledge of their chemical structure and apply methods of molecular modelling of biomolecules		[SU4] Assessment of ability to use methods and tools
[K7_K02] is aware of the limitations and the necessity of continuous development of knowledge and technology; understands the need for education and constant training		[SK5] Assessment of ability to solve problems that arise in practice

Subject contents	Lecture: 1. - Research on natural compounds - introduction and research methods (observation, isolation, identification or structure elucidation, biosynthesis, chemical ecology). 2. - 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. 3. - Antibiotics of natural origin. Detailed characteristics of a selected group of compounds. 4. - Methods of identification (TLC, HPLC, HPLC-MS) and isolation of biologically active compounds (prepTLC, FLASH, prepHPLC, CPC and HSCCC). Lab: 1. - Obtaining of plant preparations (i.e. extraction, hydrodistillation in the Deryng/Clevenger apparatus). 2. - Qualitative assessment of natural compounds (antibiotics, plant metabolites) using the methods described in the Polish Pharmacopoeia, i.e. TLC, HPLC, LC-MS, UV-Vis. 3. - Modern methods of isolation of selected biologically active compounds from biological material (prepHPLC, FLASH, CPC). 4. - 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
Laboratory	60.0%	50.0%
Exam	60.0%	50.0%

Recommended reading	Basic literature	1. - Naturalne związki organiczne. (A. Kołodziejczyk, Wydawnictwo Naukowe PWN, 2022) 2. - Farmakopea Polska XII 2020. Farmakognostyczne metody badania. Monografie szczegółowe substancji i przetworów roślinnych. Monografie narodowe substancji i przetworów roślinnych.
	Supplementary literature	1. - 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	• Prediciting the spectroscopic properties of the given molecules. • Choosing an optimal isolation method for a given structure. • Establishig of a role of a given structure in the environment.	
Work placement	Not applicable	