



## 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 Szczęblewski					
	Teachers	dr inż. Paweł Szczęblewski					
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	<p>Lecture:</p> <ol style="list-style-type: none"> <li>- Research on natural compounds - introduction and research methods (observation, isolation, identification or structure elucidation, biosynthesis, chemical ecology).</li> <li>- 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.</li> <li>- Antibiotics of natural origin. Detailed characteristics of a selected group of compounds.</li> <li>- Methods of identification (TLC, HPLC, HPLC-MS) and isolation of biologically active compounds (prepTLC, FLASH, prepHPLC, CPC and HSCCC).</li> </ol> <p>Lab:</p> <ol style="list-style-type: none"> <li>- Obtaining of plant preparations (i.e. extraction, hydrodistillation in the Deryng/Clevenger apparatus).</li> <li>- Qualitative assessment of natural compounds (antibiotics, plant metabolites) using the methods described in the Polish Pharmacopoeia, i.e. TLC, HPLC, LC-MS, UV-Vis.</li> <li>- Modern methods of isolation of selected biologically active compounds from biological material (prepHPLC, FLASH, CPC).</li> <li>- Quality control of the methods used (HPLC-MS, UV-Vis, etc.)</li> </ol>											
Prerequisites and co-requisites	Organic chemistry and analytical chemistry.											
Assessment methods and criteria	<table border="1" data-bbox="448 613 1487 719"> <thead> <tr> <th data-bbox="448 613 794 651">Subject passing criteria</th> <th data-bbox="794 613 1141 651">Passing threshold</th> <th data-bbox="1141 613 1487 651">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 651 794 685">Laboratory</td> <td data-bbox="794 651 1141 685">60.0%</td> <td data-bbox="1141 651 1487 685">50.0%</td> </tr> <tr> <td data-bbox="448 685 794 719">Exam</td> <td data-bbox="794 685 1141 719">60.0%</td> <td data-bbox="1141 685 1487 719">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory	60.0%	50.0%	Exam	60.0%	50.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>- Naturalne związki organiczne. (A. Kołodziejczyk, Wydawnictwo Naukowe PWN, 2022)</li> <li>- Farmakopea Polska XII 2020. Farmakognostyczne metody badania. Monografie szczegółowe substancji i przetworów roślinnych. Monografie narodowe substancji i przetworów roślinnych.</li> </ol>										
	Supplementary literature	<ol style="list-style-type: none"> <li>- Chromatografia cieczowa. Teoria i praktyka. (Z. Witkiewicz, W. Wardencki, I. Malinowska, Wydawnictwo Naukowe PWN, 2019)</li> </ol>										
	eResources addresses	Adresy na platformie eNauczanie:										
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> <li>• Predicting the spectroscopic properties of the given molecules.</li> <li>• Choosing an optimal isolation method for a given structure.</li> <li>• Establishing of a role of a given structure in the environment.</li> </ul>											
Work placement	Not applicable											