



Subject card

Subject name and code	SPECTROSCOPIC METHODS OF TESTING DRUGS, PG_00065570						
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				3.0	
Learning profile	general academic profile	Assessment form				exam	
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. Tomasz Laskowski					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		5.0		25.0	90
Subject objectives	The aim of the course is to acquaint the Student with the advanced 2D NMR techniques, mass spectrometry techniques, UV-VIS experiments and the basic IR techniques. As a result of the course, Students will have full knowledge of the concepts of the spectroscopic techniques listed above, as well as they will be able to solve advanced structural problems considering biologically active compounds.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W02] explains the structure and function of biomolecules and the methods and instruments for determining their quantity and activity		The student is able to solve a complex structural problem using the provided set of spectra.		[SW1] Assessment of factual knowledge		
	[K7_U02] uses research methods used in biotechnology and related fields		The student acquires knowledge of advanced 2D NMR techniques, including COSY, TOCSY, HSQC, HMBC, NOESY, and ROESY spectra, as well as complex MS spectra.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K7_K02] is aware of the potential risks and opportunities associated with the development of science and technology for the natural environment and society		The student is able to apply spectroscopic methods in structural studies of potential chemotherapeutic agents.		[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work		
Subject contents	<ol style="list-style-type: none"> Basics of NMR spectroscopy - concepts and spectrometers. Advanced 2D NMR techniques. UV-VIS spectroscopy. Basics of MS. Advanced MS techniques. Basics of IR spectroscopy. 						
Prerequisites and co-requisites	Student should know the basics of the 1D NMR spectroscopy and mass spectrometry.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test II (MS)	60.0%	50.0%
	Test I (NMR)	60.0%	50.0%
Recommended reading	Basic literature	1. Organic Structural Spectroscopy (Lambert, Joseph B.; Shurvell, Herbert F.; Lightner, David A.; Cooks, R. Graham). 2. Spektroskopowe metody identyfikacji związków organicznych (Silverstein, R).	
	Supplementary literature	-	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> • Basing on the given set of COSY, HSQC, HMBC and NOESY experiments try to decide, which of the proposed structures of the given compound is the correct one. • Basing on the MS spectrum of O-metylated poliol derivative, localize the hydroxyl groups. • Basing on the set of UV-VIS spectra, establish the purity of a given compound and determine a number of spectral forms present in a solution. 		
Work placement	Not applicable		

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