GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	SPECTROSCOPIC METHODS OF TESTING DRUGS, PG_00065570		
Field of study	Biotechnology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
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		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Tomasz Laskowski	
	Teachers	dr hab. inż. Tomasz Laskowski	

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_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.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
[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.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[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

Subject contents

1. Basics of NMR spectroscopy - concepts and spectrometers.
2. Advanced 2D NMR techniques.
3. UV-VIS spectroscopy.
4. Basics of MS.
5. Advanced MS techniques.
6. Basics of IR spectroscopy.

Prerequisites and co-requisites

Student should know the basics of the 1D NMR spectroscopy and mass spectrometry.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Test I (NMR)</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Test II (MS)</td><td>60.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Organic Structural Spectroscopy (Lambert, Joseph B.; Shurvell, Herbert F.; Lightner, David A.; Cooks, R. Graham).
2. Spektroskopowe metody identyfikacji związków organicznych (Silverstein, R).</td></tr>
<tr><td>Supplementary literature</td><td>-</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
SPEKTROSKOPOWE METODY BADANIA LEKÓW 2024-2025 - Moodle ID: 44409
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44409</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">• 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.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.