University of Gdańsk

Subject card

Subject name and code	Advanced methods in molecular biology, PG_00197642		
Field of study	Biotechnology		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Katarzyna Węgrzyn	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	10.0	20.0	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	5.0	15.0	50

Subject objectives

he aim of the course is to familiarize students with selected advanced techniques in molecular biology. During the laboratories, various techniques used in studies of protein interactions with nucleic acids and other proteins will be discussed, including techniques based on unique technologies such as MST, SPR, BLI, and AFM. Students will independently conduct each experiment and operate specialized research equipment under the supervision of the teacher.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOTECHL3_W07] The graduate has advanced knowlegde of the rules of operation and the possibilities of using research techniques and tools used in biotechnology.	Student is familiar with selected advanced techniques in molecular biology, used in studies of protein interactions with nucleic acids and other proteins.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[BIOTECHL3_U08] The graduate is able to learn independently and in a targeted manner, develop his or her competences and plan their improvement.	Student is able to independently, under the supervision of the teacher, conduct analyses using specialized research equipment.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written

Subject contents

Laboratories:

- Electrophoretic Mobility Shift Assay (EMSA)
- Bio-Layer Interferometry (BLI) / Surface Plasmon Resonance (SPR)
- Micro-Scale Thermophoresis (MST)
- Atomic Force Microscopy (AFM)

Auditoriums:

- Theoretical introduction to advanced molecular biology methods.
- Discussion of conducted analyses, obtained results. Summary of classes.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Test</td><td>50.0%</td><td>55.0%</td></tr>
<tr><td>Reports</td><td>50.0%</td><td>45.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Materials prepared by the teacher.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Selected publications (review and experimental).

Handbook of Surface Plasmon Resonance Richard B. M. Schasfoort, Anna J. Tudos 2008

Introduction to Atomic Force Microscopy: Theory, Practice, Applications Paul E. West 2006

DNA-protein Interactions: A Practical Approach Andrew Arthur Travers, Malcolm Buckle - 2000</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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