

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	The 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 knowledge 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: <ul style="list-style-type: none"> • Electrophoretic Mobility Shift Assay (EMSA) • Bio-Layer Interferometry (BLI) / Surface Plasmon Resonance (SPR) • Micro-Scale Thermophoresis (MST) • Atomic Force Microscopy (AFM) Auditoriums: <ul style="list-style-type: none"> • Theoretical introduction to advanced molecular biology methods. • Discussion of conducted analyses, obtained results. Summary of classes. 						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	50.0%	55.0%
	Reports	50.0%	45.0%
Recommended reading	Basic literature	Materials prepared by the teacher.	
	Supplementary literature	<p>Selected publications (review and experimental).</p> <p>Handbook of Surface Plasmon Resonance Richard B. M. Schasfoort, Anna J. Tudos 2008</p> <p>Introduction to Atomic Force Microscopy: Theory, Practice, Applications Paul E. West 2006</p> <p>DNA-protein Interactions: A Practical Approach Andrew Arthur Travers, Malcolm Buckle - 2000</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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