

Subject card

Subject name and code	Molecular diagnostics (lab.), PG_00153606						
Field of study	Biotechnology						
Date of commencement of studies	October 2025	Academic year of realisation of subject			2025/2026		
Education level	Master's studies	Subject group			Obligatory subject group 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			2.0		
Learning profile	academic	Assessment form					
Conducting unit	Laboratory of Photobiology and Molecular Diagnostics -> UG Institute of Biotechnology -> Intercollegiate Faculty of Biotechnology UG-MUG -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Magda Rybicka-Misiejko				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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	To familiarize students with the techniques and tools used in DNA/RNA analysis. During the course, the student will be able to plan an experiment, i.e. organize space and work time. The student will learn to perform experiments independently and to document the steps performed during the experiments and the results obtained. The student will acquire the ability to use complex research techniques (e.g. real-time qPCR), and the ability to operate equipment used for the detection of genetic material and data analysis (Light Cycler, Nanodrop).						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOTECHMU2_K02] The graduate is willing to work in a team, in particular, to jointly carry out laboratory work	The student communicates effectively with research team members, expressing ideas clearly and listening actively to others. The student demonstrates responsibility for assigned tasks in the experiment and contributes to the achievement of common goals. The student actively participates in brainstorming and other forms of creative problem-solving in a team/group. The student effectively manages time and resources in assigned research tasks. The student critically analyzes and evaluates the results of his/her research and that of other team/group members, contributing to improving the quality of the work.	[SK5] implementation of a problem task [SK8] observation of student's independent or team work
	[BIOTECHMU2_U01] The graduate is able to do laboratory work; plan and carry out an experiment; document activities and results; use complex techniques and research tools under the supervision of a tutor in laboratory work; operate laboratory equipment; apply the principles of occupational health and safety; understand the dangers of working in a laboratory	Upon completion of the course, the student will: 1. Demonstrate the skills necessary to work effectively in a laboratory environment. 2. Independently plan and conduct scientific experiments, taking into account available resources and time constraints. 3. Reliably document the progress of experiments and the results obtained, using appropriate methods and tools. 4. Uses advanced techniques and research tools in laboratory work under the supervision of a supervisor. 5. Efficiently operates specialized laboratory equipment and understands the principles of its operation and maintenance. 6. Adheres to health and safety rules in the laboratory, demonstrating responsibility for self and co-workers. 7. Identifies, understands, and responds appropriately to potential hazards associated with working in a laboratory environment.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SU3] text preparation/written work [SU5] implementation of a problem task [SU6] demonstration of practical skills

	Course outcome	Subject outcome	Method of verification
	[BIOTECHMU2_K05] The graduate is willing to adhere to the principles of work safety, in particular laboratory work; be responsible for his/her own safety and that of others; behave in an appropriate manner in an emergency	Upon completion of the course, the student will: Comply with occupational health and safety regulations with special emphasis on the laboratory environment, demonstrate responsibility for the safety of self and co-workers, and be able to respond appropriately to hazardous situations. auto_awesome Język oryginału: angielski 283 / 5 000 Upon completion of the course, the student will Comply with occupational health and safety regulations with special emphasis on the laboratory environment, demonstrate responsibility for the safety of self and co-workers, and be able to respond appropriately to hazardous situations.	[SK4] test/exam - oral or written [SK5] implementation of a problem task [SK8] observation of student's independent or team work
	[BIOTECHMU2_U02] The graduate is able to collect and interpret empirical data; use statistical methods and IT tools in data analysis; formulate conclusions based on empirical data	Upon course completion, students can independently collect, analyze, and interpret empirical data using appropriate statistical methods and IT tools, and formulate conclusions based on the results.	[SU2] presentation/project/paper/report [SU3] text preparation/written work
Subject contents	The laboratory curriculum includes learning molecular biology techniques used in analysis-based diagnostics of genetic material (human, microbiological). In addition, laboratory exercises include knowledge of assessing the quality of material, genetic material, and its suitability for specific analyses. An important element of the exercises is learning to work under sterile conditions and the ability to organize workspace and time.		
Prerequisites and co-requisites	Formal requirements Preferred knowledge, skills and competences acquired during laboratory exercises in General Microbiology, Molecular Biology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Activity and teamwork skills	51.0%	7.5%
	Test	51.0%	60.0%
	Health and safety rules	51.0%	7.5%
	Report	51.0%	25.0%
Recommended reading	Basic literature	1. Treści udostępnione przez prowadzącego wykłady Diagnostyka molekularna. 2. Słomski, R. (red.) Analiza DNA. Praktyka. Poznań: Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu, 2014 3. Bał J. Genetyka medyczna i Molekularna. PWN Warszawa 2017 4. Lewandowska Ronnegren A. Techniki laboratoryjne w Biologii Molekularnej. MedPh, Wrocław 2018	
	Supplementary literature	Buckingham, M.L., Flaws, L.: Molecular diagnostics: Fundamentals, Methods and Clinical Applications. 2019	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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