



Subject card

Subject name and code	DIPLOMA LABORATORY I, PG_00063482						
Field of study	Biotechnology						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		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	3		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Beata Zalewska-Piątek				
	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	The aim of the Diploma Laboratory course is to prepare students to independently carry out research tasks related to the topic of their diploma thesis, including planning and conducting experiments, analyzing and interpreting obtained results, and developing conclusions. The course aims to develop practical skills in applying knowledge acquired during the first and second cycle of studies, improving teamwork and individual work skills, and developing competences in documenting and presenting the results of the diploma project.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W06] recognizes the technological and scientific, as well as organizational and economic opportunities and limitations in biotechnology and related fields	The student recognizes and analyzes the technological, scientific, organizational, and economic opportunities and limitations associated with the design, production, and implementation of antimicrobial chemotherapeutics, including antibiotics, synthetic chemotherapeutics, and phage-derived natural products.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U04] predicts the interaction of biomolecules and biologically active compounds on living organisms and the course of processes involving them based on knowledge in biology, biotechnology and related fields and computer methods of data analysis, modeling and simulation	Students can predict, investigate, and evaluate the effects of tested compounds and therapeutical preparations on bacterial and fungal pathogen cells. Students can statistically evaluate the obtained results.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task
	[K7_K01] understands the need to constantly update knowledge based on the state of the art in accordance with the latest scientific literature, improve professional skills and the importance of teamwork	The student understands the need to continually update their theoretical knowledge and acquire new practical skills based on reliable sources such as textbooks and scientific publications. The student understands the crucial role of teamwork in solving scientific and technological problems.	[SK3] Assessment of ability to organize work [SK2] Assessment of progress of work
	[K7_W07] has the skills to design experiments with respect to the protection of intellectual property and the principles of bioethics and applicable legislation	The student is able to plan research and design biotechnological products and processes, such as new antimicrobial drugs, taking into account applicable legal regulations and bioethical principles, such as clinical trial requirements, patient rights, and environmental protection principles.	[SW3] Assessment of knowledge contained in written work and projects
Subject contents	<p>Course content – laboratory</p> <p>Electrophoretic analysis and quality assessment of M13mp18 vector DNA.</p> <p>Transformation of <i>E. coli</i> K12 JM101 with phage and plasmid DNA, including bluewhite selection (IPTG/X-gal).</p> <p>Propagation of M13 phage and evaluation of phage infectivity on selective media.</p> <p>Isolation of replicative form (RF) phage DNA and preparation of genetic material for further molecular analyses.</p> <p>Preparation of control <i>E. coli</i> strains and isolation of Dr fimbriae.</p> <p>Protein analysis using SDS-PAGE and Western blot (fimbrial subunits DraE).</p> <p>Investigation of the impact of phage infection on Dr fimbriae production, phenotype, and growth dynamics of <i>E. coli</i>/Dr⁺ and <i>E. coli</i>/Dr⁻ strains.</p>		
Prerequisites and co-requisites	Basic knowledge of microbiology, biotechnology and chemistry of natural products.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Preparation of the dissertation	60.0%	60.0%
	Analysis and interpretation of results	60.0%	10.0%
	Assessment of the implementation of the research task	60.0%	30.0%

Recommended reading	Basic literature	Monographs, scientific articles and other literature sources indicated by the thesis supervisor, consistent with the subject of the research task being carried out.
	Supplementary literature	Publications independently collected by the student working on the diploma thesis, in accordance with the thematic scope of the research task being carried out.
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>What is the functional role of the DraE subunit in the structure of Dr fimbriae?</p> <p>How can bacteriophage infection affect the expression levels of surface proteins such as fimbriae?</p> <p>What factors influence the migration speed of DNA fragments in agarose gel electrophoresis?</p> <p>Why does SDS-PAGE separate proteins primarily according to their molecular weight?</p>	
Practical activities within the subject	Not applicable	

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