



Subject card

Subject name and code	Pharmaceutical Biotechnology–Team Project, PG_00058621						
Field of study	Biotechnology						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Iwona Gabriel				
	Teachers		dr hab. inż. Iwona Gabriel				
			dr hab. inż. Sebastian Demkowicz				
			dr inż. Andrzej Skwarecki				
			dr inż. Kamila Rząd				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	30.0	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		35.0	100
Subject objectives	Developing a plan and schedule for implementing a multi-stage research project, solving the research problem and presenting the results obtained.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W02] has advanced knowledge of structure and activity of enzymes and biologically active compounds also in pharmacological context, knows basic instrumental methods of qualitative and quantitative analysis and activity studies of biomolecules	The student has extended and in-depth knowledge of chemical synthesis methods, verification of the efficiency of synthesis stages and determination of the purity of the obtained compounds. The student is able to determine the biological activity of the tested compound.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
	[K7_U02] has practical skills in commonly used biochemical methods including enzyme activity and kinetics assays, electrophoresis, western blotting, ELISA assays, fluorescence microscopy, flow cytometry	The student is able to use the knowledge of experimental methods and techniques to effectively perform planned research tasks.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
	[K7_U07] is able to consider bioethical issues and regulations in research planning and design of biotechnological products and processes	The student knows bioethical problems and regulations in planning research using microorganisms.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
	[K7_K04] is aware of the need to solve problems and perform tasks, independently formulate questions to solve a given problem or task; is able to plan the execution of a larger task by dividing it into partial tasks and draw up an appropriate schedule	The student is able to propose a plan for the synthesis of a biologically active compound and methods for determining its antimicrobial activity.	[SK1] Assessment of group work skills [SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
	[K7_U08] can analyze patent documents, can make a preliminary assessment of the patentability of a product, process or substance, can use patent databases	The student presents the obtained results and presents the resulting conclusions.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
Subject contents	Group is divided into executive groups of 3-4 students. At the beginning of the project, the student group is given a project topic of synthesis and determine antimicrobial activity of compounds, sulfonamide derivatives. Then students perform a literature analysis and review of relevant databases, formulates a concept for solving the problem, become familiar with the methodology of conducting planned research, and in consultation with the academic teacher, prepare a research schedule. During laboratory classes, the student group performs experiments according to a developed schedule. Laboratory classes end with the preparation and presentation of a report on the implementation of the project. The second part of the design classes includes the analysis of patent documents, a preliminary assessment of the patentability of the selected product and the preparation of a patent application		
Prerequisites and co-requisites	Knowledge of issues in the field of Biochemistry, Enzymology, Drug Biotechnology.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	The end report	50.0%	40.0%
	Assessment of a patent application	50.0%	30.0%
	Assessment of a group project	50.0%	30.0%
Recommended reading	Basic literature	Supporting materials available on the department's home page	
	Supplementary literature	None	
	eResources addresses	Adresy na platformie eNauczanie: Biotechnologia Leków II - 2023 - Moodle ID: 14874 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=14874	
Example issues/ example questions/ tasks being completed	How determine the minimum growth inhibitory concentration (MIC)? List the classes of sulfonamides. What is the mechanism of action of sulfadiazine?		
Work placement	Not applicable		