



Subject card

Subject name and code	Microbiology II, PG_00054757						
Field of study	Biotechnology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2028/2029		
Education level	first-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	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		6.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Laboratorium Biotechnologii i Mikrobiologii -> Department of Biotechnology and Microbiology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Beata Krawczyk				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	45.0	0.0	0.0	75
	E-learning hours included: 0.0						
	Additional information:						
	Lecture - at the university						
Laboratory - empirical experience - at the university							
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	75		10.0		65.0	150
Subject objectives	Getting to know the" golden standards" of microbiology lab in clinical and environmental diagnostics and phenotypic and genotypic variability of organisms.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U04		Knowledge of basic laboratory techniques and the ability to use them.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		
	K6_W04		The student can use the knowledge acquired during the lecture and the laboratory.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	K6_K06		Ability to work in a team, and work in sterile conditions. He can find a solution to the problem. Can perform the assigned task together		[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills		

Subject contents	Course content – lecture Laboratory: Aseptic technique, staining and observation of microorganisms; identification of unknown bacteria - morfological study and physiological characteristics (oxidation and fermentation tests, hydrolytic reactions, biochemical tests - the API 20E System; Enterotube II System); Gram-negative intestinal pathogen; the Streptococci - biochemical characteristics; the Staphylococci - isolation and Identification; Winogradsky column; Bacteriological examination of water. Lectures: Terms used in taxonomy. Microbiological diagnostics based on phenotypic features. Problems from the use of phenotypic methods in diagnostics. Non-cultivating and hard-cultivating microorganisms. Biofilms as organized bacterial communities. Modern systematics of bacteria. The concept of a bacterial species; Evolution of bacterial genomes 2. Characteristics of Archaea. Are there nanobacteria? 3. Relations between bacteria, between bacteria and invertebrates, bacteria and plants, and between bacteria and animals; 4. Pathogenesis; Virulence factors of bacteria and adaptation to environment. The role of toxins in pathogenesis. Structure and mechanism of action of exotoxins and endotoxins; Human commensal microbiota.		
Prerequisites and co-requisites	Completion of the course "General microbiology"		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	a passed exam	60.0%	50.0%
	reports	60.0%	50.0%
Recommended reading	Basic literature	1. Krawczyk B. i in. Wybrane zagadnienia z mikrobiologii klinicznej i środowiskowej teoria i ćwiczenia laboratoryjne wyd. PG, 2019	
		2. Eligia Szewczyk Diagnostyka Bakteriologiczna PWN, 2005	
		3. Abigail A. Salyers, Dixie D. Whitt Mikrobiologia, różnorodność, chorobotwórczość i środowisko; PWN 2003	
		4. Brown TA.. Genomy. PWN.2018	
		5. Galdwin M, Trattler B. Mikrobiologia Kliniczna red. tł. S.Giedrys-Kalemba, 2010 wyd. Szczecin D.W. Publishing	
	Supplementary literature	1. Brock T., Madigan MT, Martinko JM. Brock Biology of Microorganisms. Pearson International Edition	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Issues to the laboratory in the student book: "Krawczyk B. et al. "Selected issues in clinical and environmental microbiology - theory and laboratory exercises" ed. PG, 2019		
Practical activities within the subject	Not applicable		

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