

Subject card

Subject name and code	Microbiology, PG_00188267						
Field of study	Mikrobiologia (Ćw.laboratoryjne)						
Date of commencement of studies	October 2026		Academic year of realisation of subject			2026/2027	
Education level	Bachelor's studies		Subject group			Obligatory subject group in the field of study 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 polish	
Semester of study	1		ECTS credits			2.0	
Learning profile	academic		Assessment form			credit	
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Joanna Żebrowska				
	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 course introduces students of forensic science to the basic issues of microbiology, particularly in the context of laboratory work, aseptic techniques and methods used in the analysis and identification of microorganisms that may be of biological, sanitary or evidentiary significance. The classes focus on practical work with culture media, sterilisation, preparation of material for testing and the performance of basic microbiological techniques.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[AKRL3_U02] The graduate can plan and organize individual and team work and collaborate with others in team projects (including interdisciplinary teams).	student is able to prepare the workplace and divide tasks within the group in accordance with health and safety and aseptic principles; coordinates the stages of microbiological experiments (preparation of media, sterilisation, cultures, documentation of results); communicates effectively with team members, conveying observations and conclusions; cooperates with others in operating equipment (autoclave, culture kits, incubators), ensuring safety and correct procedures; is able to organise their own work, prepare materials and perform tasks in accordance with laboratory instructions; solves problems arising in teamwork, proposing improvements and taking responsibility for the assigned stage of the experiment.	[SU5] realizacja zadania problemowego [SU6] demonstracja umiejętności praktycznych [SU8] obserwacja samodzielnej lub zespołowej pracy studenta
	[AKRL3_K04] The graduate is ready to cooperate with representatives of other fields—law, medicine, biology—within forensic expertise.	The student communicates clearly and professionally with people outside their own field of specialisation, understands the role of microbiology in forensic analysis and is able to present results in a way that is understandable to specialists in other fields, cooperates in interdisciplinary teams, understanding the limitations and scope of competence of various experts, adheres to the principles of data confidentiality and ethics in working with evidence, is able to interpret microbiological observations in a broader legal and medical context, e.g. in terms of contamination, time of death, sample origin, applies appropriate documentation procedures so that the results can be used in forensic expertise.	[SK2] prezentacja/projekt/referat/raport [SK4] test/egzamin - ustny lub pisemny [SK5] realizacja zadania problemowego
	[AKRL3_K06] The graduate is ready to follow occupational health and safety regulations in the laboratory and care for the safety of themselves and others.	The student wears protective clothing, including an apron, gloves and goggles, in accordance with laboratory requirements, uses laboratory equipment (burner, autoclave, glassware, agar media) correctly and in accordance with the instructions, maintains order and asepsis at the workstation, limiting the risk of contamination, identifies biological hazards, responds to non-compliance and reports it to the supervisor, ensures the safety of others, does not perform activities that pose a risk to people in the laboratory, complies with GLP and health and safety rules, including the handling of biological waste.	[SK4] test/egzamin - ustny lub pisemny [SK6] demonstracja umiejętności praktycznych [SK8] obserwacja samodzielnej lub zespołowej pracy studenta

	Course outcome	Subject outcome	Method of verification
	[AKRL3_U11] The graduate is able to work effectively in a laboratory team while adhering to professional ethics and organisational rules.	The student performs assigned tasks in a responsible and reliable manner, in accordance with procedures and instructions; respects the work of others, ensures their safety and does not disrupt the course of the exercises; adheres to the principles of professional ethics, including research integrity, proper documentation of results and does not falsify data; communicates information, results and problems in a clear and professional manner, in accordance with the rules of communication in the laboratory; complies with laboratory regulations, health and safety rules, aseptic practices and good laboratory practice (GLP); supports the work of the team, responds to colleagues' mistakes and provides assistance in problematic situations.	[SU5] realizacja zadania problemowego [SU6] demonstracja umiejętności praktycznych [SU8] obserwacja samodzielnej lub zespołowej pracy studenta
Subject contents	1. Introduction to microbiology laboratory exercises: Microbiological laboratory equipment, Health and safety, GLP and aseptic work principles, Sterilisation and disinfection methods, Autoclave construction, operating principle, operation 2. Conditions for microorganism growth: Microbiological media and culture media, Preparation and sterilisation of microbiological media, Microbiological culture techniques, Incubation of biological material 3. Microorganism morphology: analysis and interpretation of results, preparation of microscope slides and microscopy 4. Microorganism culture: Escherichia coli culture, growth curve 5. Human microflora: swabs and analysis of permanent and transient flora, testing for antibiotic resistance and the action of finocides, determining MIC 6. Biochemical characteristics: differential media and biochemical evaluation of bacteria from the Enterobacteriaceae family from other bacteria 7. Summary and completion of laboratory exercises.		
Prerequisites and co-requisites	Biology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	51.0%	70.0%
	reports	30.0%	20.0%
	experiment design diagrams	30.0%	10.0%
Recommended reading	Basic literature	Salyers, A.A., Whitt, D.D.: Microbiology. Diversity, pathogenicity and environment. Wydawnictwo Naukowe PWN, Warsaw 2003 Kunicki-Goldfinger, W.J.H. The life of bacteria. Wydawnictwo Naukowe, PWN, Warsaw 2005 Schlegel, H.G. General Microbiology. PWN Scientific Publishers, Warsaw 2000 Libudzisz, Z., Kowal, K., Żakowska, Z. (eds.) Technical Microbiology. Microorganisms and their environments. Wydawnictwo Naukowe, PWN, Warsaw 2007 Libudzisz, Z., Kowal, K., Żakowska, Z. (eds.) Technical Microbiology. Microorganisms in biotechnology, environmental protection and food production PWN Scientific Publishers, Warsaw 2008 Kur, J.: Exercises in General Microbiology. Gdańsk University of Technology Press, Gdańsk 1993 Tortora, G.J., Funke, B.R., Case, C.L. Microbiology. An introduction. Pearson International Edition, San Francisco 2007	

	Supplementary literature	E. M. Szewczyk Bacteriological Diagnostics. Wydawnictwo Naukowe PWN, Warsaw 2005 Brown T. A. [Polish edition edited by Piotr Węglński] Genomes, PWN Scientific Publishers, Warsaw, latest edition Stryer L. Biochemistry. PWN Scientific Publishers, Warsaw, latest edition J. Baj, Z. Markiewicz Molecular Biology of Bacteria. Warsaw 2006
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Explain why, during aseptic work, the eza and the outlet of the test tube must be heated in a gas burner flame. 2. State the difference between reduction culture and surface culture (murawa) and indicate when each is used. 3. What determines whether a bacterium stains Gram-positive or Gram-negative in Gram staining? 4. List and briefly describe the four phases of the bacterial growth curve. 5. How does permanent flora differ from transient flora on the skin, and give one example of a bacterium for each. 6. What is the purpose of using MacConkey's medium and how should the result of lactose fermentation be interpreted?	
Work placement	Not applicable	

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