

Subject card

Subject name and code	Microbiology, PG_00050802						
Field of study	Environmental Protection						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		3.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Marian Sętkas				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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		40.0	75
Subject objectives	1. Basic concepts in microbiology. 2. Understanding the structure of a bacterial cell and its functioning (physiology and energetics of a bacterial cell and taxis). 3. The influence of physical, chemical and biological factors on the growth and development of microorganisms. 4. Bacteriophages and mechanisms of antibiotic resistance. 5 Understanding the role of microorganisms in maintaining the biological balance in environments (circulation of basic elements). 6 Mechanisms of bacterial pathogenesis and understanding the fundamental importance of genetic recombination and genetic variation						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OŚL3_K05] Identifies the level of her/his knowledge and skills, demonstrates the need to update knowledge about the environment and its protection, demonstrates the need for continuous professional training and personal development.	Understands the need for continuous professional education and updating knowledge about the impact of microorganisms on the environment and its protection; the ability to work individually and demonstrate initiative and independence in activities as well as effective cooperation in teamwork; selection and implementation of an action plan with previously defined priorities for its implementation; responsibility for the safety of one's own work and the safety of others and the workplace, as well as correctly applying the rules of conduct in emergency situations	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report [SK5] implementation of a problem task [SK8] observation of student's independent or team work
	[OŚL3_W06] Characterises levels of life organization, biodiversity and the interaction of organisms and the environment.	Knows a basis and characterizes of microbial biodiversity and interactions between microorganisms and the environment; bacterial analysis and identification techniques; basic principles of safety, ergonomics and hygiene when working with microorganisms;	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW3] text preparation/written work
	[OŚL3_W02] Characterises the relationships and relationships between various disciplines of natural sciences and science, uses knowledge of mathematics, physics, chemistry and biology in the description of basic concepts, concepts and principles in environmental protection.	Knows the connections and dependencies between various disciplines of natural and exact sciences, uses knowledge of mathematics, physics, chemistry and biology to describe basic concepts, concepts and principles in general microbiology, the importance of microorganisms in maintaining environmental balance and the need to study and analyze phenomena related to biology microorganisms; ;	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion
Subject contents	Lecture topics: introduction to microbiology and structure of a bacterial cell, cell envelopes and virulence factors in bacteria, bacterial metabolism, method of obtaining matter and energy, replication of genetic material and parasexual processes (recombination, transformation, conjugation), identification of bacteria and basics of bacterial systematics, viruses bacterial, antibacterial factors and mechanisms of their action, mechanisms of bacterial resistance to antibiotics and chemotherapeutics, physiological and pathogenic flora in humans, soil and water flora, participation of microorganisms in biodegradation and circulation of elements, use of genetically modified bacteria		
Prerequisites and co-requisites	Prerequisites knowledge of basic concepts in general biology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	100.0%
Recommended reading	Basic literature	Kunicki-Goldfinger "Życie bakterii" (red. J. Baj., Z. Markiewicz), PWN, Warszawa 2005 i późniejsze wznowienia; "Biologia molekularna bakterii" (red. J. Baj, Z. Markiewicz), PWN, Warszawa 2007 i późniejsze wznowienia	
	Supplementary literature	Jawetz E., Melnick J., Adelberg E., "Przegląd mikrobiologii lekarskiej", PZWL, Warszawa 1991 i późniejsze wznowienia Kotenko K., Sedlaczek L., Lachowicz T.M., " Biologia bakterii", PWN, Warszawa 1984 i późniejsze wznowienia	
	eResources addresses		

Example issues/ example questions/ tasks being completed	1. The selective and differentiating factors in Chapman's agar are: 2. The following types of bacteria grow selectively on McConkey's medium: 3. The most effective mechanism of antibiotic resistance in bacteria is: 4. Which types of microorganisms are insensitive to antibiotics that inhibit the development of bacterial cell walls (mureins)? 5. Metabiosis is a phenomenon that describes:
Work placement	Not applicable

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