University of Gdańsk

Subject card

Subject name and code	Microbiology, PG_00050802		
Field of study	Environmental Protection		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	undergraduate studies	Subject group	Obligatory subject group 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 polish
Semester of study	3	ECTS credits	3.0
Learning profile	academic	Assessment form	
Conducting unit	Faculty of Biology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Marian Sęktas	
	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_U07] Uses basic laboratory techniques, conducts field research and performs qualitative and quantitative analyses and draws conclusions on this basis for practical purposes.	Applies basic measurement and analytical techniques used in microbiology; using terminology in the field of microbiology and the nomenclature of individual disciplines related to it;	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[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_U02] Plans, selects appropriate research and measuring equipment and devices, performs physicochemical measurements and experiments; analyses the results and draws conclusions based on them.	After selecting measurement equipment and instrumentation appropriate to the research task, a preliminary analysis of the composition of microorganisms isolated from specific environments (habitats) is performed.	[SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[OŚL3_U09] Prepares in Polish/ English a short description of research, observation or problem task carried out during classes using appropriate scientific terminology.	Is able to prepare a protocol describing the materials used, methods and ways of detecting a given biological effect, including specific experimental data, using scientific terminology	[SU2] presentation/project/paper/ report [SU3] text preparation/written work [SU5] implementation of a problem task [SU8] 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 Kotełko K., Sedlaczek L., Lachowicz T.M., " Biologia bakterii", PWN, Warszawa 1984 i późniejsze wznowienia
	eResources addresses	Adresy na platformie eNauczanie:
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	

Document generated electronically. Does not require a seal or signature.