

Subject card

Subject name and code	Biotechnology of the 21st century – achievements, opportunities, challenges, PG_00137302						
Field of study	History						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's studies		Subject group				
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		English English		
Semester of study	2		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Intercollegiate Faculty of Biotechnology UG-MUG -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Andrea Lipińska				
	Teachers		dr hab. Mariusz Grinholc, prof. UG				
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		0.0		20.0	50
Subject objectives	The aim of the lecture series is to introduce interested students to the key scientific discoveries underpinning modern biotechnology. He/she will gain knowledge important for functioning in modern society (KK_01_BM). In addition, the student will gain competence in the awareness and understanding of the benefits and risks associated with the conduct of scientific research with particular emphasis on genetically modified organisms, modern diagnostic and therapeutic strategies, as well as the perception and formulation of ethical problems associated with biotechnology (KK_03_BM).						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
			Is able to identify areas of biotechnology issues that require further deepening and supplementing knowledge. Shows initiative in searching for current scientific sources related to contemporary biotechnology. Understands the need for continuous professional development and tracking scientific progress in the area discussed in class. Participates in class discussions, demonstrating the ability to formulate questions that deepen knowledge.		[SK4] test/exam - oral or written		
			Identifies potential environmental, health and social hazards associated with the use of the discussed biotechnological technologies. Recognizes ethical dilemmas resulting from conducting scientific research in biotechnology and is able to propose ethical solutions.		[SK4] test/exam - oral or written		

Subject contents	In the lecture series, students are introduced to modern and interdisciplinary research techniques and methods used in modern biotechnology and the directions of research development. They will also become familiar with the areas of everyday life in which the products of modern biotechnology. The following issues, among others, will be presented in the course: the significance and application of microorganisms in biotechnology, environmental protection; modern diagnostics of cancer, genetic diseases and diseases caused by viruses; methods of creation, significance and practical application of genetically modified organisms (GMOs); ethical and social aspects related to genetically modified organisms; human evolution and molecular mechanisms of drug action. Lecture topics: 1. Chemical molecules and biological organisms in the guardian of environmental purity. 2. Astrobiology. 3. DNA. 4. Computer simulations - modelling the microworld. 5. Molecular chaperones - the chaperone proteins. 6. The world under the microscope - microbes around us. 7. Bacteria for humans: possibilities of using spores in biotechnology. 8. Strangers inside us. The mitochondria. 9. The dark and light sides of a little black - a brief history of coffee and its importance for humans. 10. What are plants capable of in vitro? 11. Plant lipids as substitutes for petroleum. 12. genetically enhanced plants hope or threat? 13. Biotechnology and human origins. 14. Xenobiotics. 15. Viruses. Why vaccinate.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Credit is based on attendance at all classes and correct answers (51%). Excused absences (maximum of two) can be made up on the basis of short essays.	51.0%	100.0%
Recommended reading	Basic literature	Selected articles related to the topic under discussion from journals: World of Science; Knowledge and Life, Biotechnology; Nature, Science, New Scientist ect.	
	Supplementary literature	brak	
	eResources addresses		
Example issues/ example questions/ tasks being completed	no		
Work placement	Not applicable		

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