University of Gdańsk

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

<table>
<tr><td>Subject contents</td><td>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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>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.</td><td>51.0%</td><td>100.0%</td></tr>
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<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Selected articles related to the topic under discussion from journals: World of Science; Knowledge and Life, Biotechnology; Nature, Science, New Scientist ect.</td></tr>
<tr><td>Supplementary literature</td><td>brak</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>no</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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