University of Gdańsk

Subject card

Subject name and code	Molecular genetics of bacteria, PG_00198348		
Field of study	Genetics and Experimental Biology		
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	4	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Molecular Genetics of Bacteria -> Faculty of Biology -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Katarzyna Potrykus	
	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	4.0	16.0	50

Subject objectives

- To familiarize students with the course and regulation of basic processes related to the replication and protection of the integrity of bacterial genetic material as well as expression of the genetic information contained therein

- To familiarize students with the latest trends and concepts in molecular genetics of bacteria

- To familiarize students with classic and novel research tools used in bacterial genetics

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GBEL3_W05] A graduate has an advanced knowledge and understanding of: principles for planning research based on the achievements of biological sciences and related disciplines and the possibility of putting their results into practice, principles for the operation of equipment and apparatus used in molecular genetics research, and the principle of interpreting biological phenomena and processes based on empirical data in research work and practical action, taking into account the sustainable use of biodiversity.	Student knows the principles of planning research based on the achievements of bacterial genetics and the possibilities of using their results in practice, the principles of operation of equipment and apparatus used in research in the field of molecular genetics of bacteria and the principle of interpreting phenomena and processes taking place in bacterial cells based on empirical data in research and practical activities	[SW5] implementation of a problem task
	[GBEL3_K01] The graduate is prepared to: use of theoretical knowledge in laboratory and production practice	Student is ready to use their theoretical knowledge in laboratory and production practice	[SK5] implementation of a problem task [SK8] observation of student's independent or team work
	[GBEL3_K02] The graduate is prepared to: critically evaluate their own knowledge and methods in molecular biology and related fields and commercialise their research.	Student is ready to critically evaluate methods in the field of molecular biology	[SK1] oral statement/conversation/ discussion [SK6] demonstration of practical skills [SK8] observation of student's independent or team work
	[GBEL3_K08] The graduate is prepared to: takes responsibility for equipment/materials entrusted to it and respects the work of others.	Student is responsible for the entrusted equipment/materials, their own work and respects the work of others	[SK8] observation of student's independent or team work
	[GBEL3_U01] The graduate is able to: independently perform practical tasks in the biological and related sciences, formulate research problems, analyse their results and draw conclusions.	Student is able to independently perform simple practical tasks in the field of biological and related sciences	[SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
	[GBEL3_U03] The graduate is able to: use research apparatus and tools and, following the correct sequence of operations, carry out simple physical, biological or chemical observations and measurements in laboratory work in the biological sciences.	Student uses basic research equipment and tools and, maintaining the correct sequence of activities, performs simple physical, biological or chemical observations and measurements in laboratory work in the field of science.	[SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
	[GBEL3_U07] The graduate is able to: work as part of a team and organise work in accordance with the principles of occupational health and safety and ergonomics.	Student is able to work in a team and organize their work	[SU8] observation of student's independent or team work
	[GBEL3_W01] A graduate has an advanced knowledge and understanding of: the structure and properties of the main types of biological macromolecules; the molecular mechanisms of basic metabolic pathways and genetic information flow; the sources of genetic variation in organisms and the mechanisms of evolution. They can explain the principles of inheritance, the differences in structure and function between prokaryotic and eukaryotic cells, as well as the structure and functional relationships at the cellular and tissue levels.	Student describes the structure and properties of basic types of biological macromolecules, molecular mechanisms of basic metabolism pathways and the flow of genetic information in bacterial cells, and sources of variability of bacterial cells; explains the rules of reproduction and inheritance of genetic material	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
	[GBEL3_W04] A graduate has an advanced knowledge and understanding of: knowledge applied to microbial and plant biotechnology.	Student has basic knowledge of microbial biotechnology	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task

<table>
<tr><td>Subject contents</td><td>- DNA structure and organization of the bacterial chromosome, DNA replication in bacterial cells, bacterial DNA isolation methods, plasmids

- Basics of genetic engineering, including: PCR, restriction enzymes, cloning, alpha-complementation

- Gene expression, transcription regulation, reporter genes</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>test on each laboratory class</td><td>51.0%</td><td>80.0%</td></tr>
<tr><td>written report</td><td>51.0%</td><td>20.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Snyder L., Peters J.E., Henkin T.M., Champness W., Molecular Genetics of Bacteria, 4th Edition, ASM Press 2013

Henkin, T.M., Peteres J.E., Snyder & Champness Molecular Genetics of Bacteria, 5th Edition, ASM Press 2020</td></tr>
<tr><td>Supplementary literature</td><td>Materials selected by the instructor from current literature available on a given topic.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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