University of Gdańsk

Subject card

Subject name and code	Graduate study lecture - Molecular genetics, PG_00082258		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Bionanotechnology -> Department of Molecular Biotechnology -> Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Joanna Jeżewska-Frąckowiak	
	Teachers	dr Joanna Jeżewska-Frąckowiak dr hab. Agnieszka Żylicz-Stachula	

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

Additional information:

multimedia presentation, problem tasks, essay, presentation, work with online resources and applications

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. To familiarize students with the structure and structure of the genome and the laws that govern inheritance.
2. To familiarize students with the gene processing processes listed in the syllabus (replication, repair, recombination, transcription, translation, regulation of gene expression).
3. To familiarize students with the basic tools of genetic engineering.
4. To familiarize students with DNA sequencing techniques and the latest trends in this field.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	Skillfully uses online resources, selects source material, and studies selected issues independently or in a team.	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report [SK5] implementation of a problem task
[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	The student knows the structure and processes of the genome, chosen modern tools and techniques of genetic engineering and molecular genetics.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report [SW5] implementation of a problem task
[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	Uses online resources to design, simulate genetic processes or conduct sequence analysis.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report [SU5] implementation of a problem task

<table>
<tr><td>Subject contents</td><td>Construction, structure and physical organization of genetic material, tools of genetic engineering, genetic code, Mendel's Laws, bacteriophages, DNA replication, DNA repair, mutations, DNA recombination, DNA transcription, RNA, translation, regulation of gene expression, operons, sources of genetic variability, DNA sequencing, Sanger method, pyrosequencing, NGS, genome sequencing, template preparation, vectors for library generation, sequence assembly, genome sequencing strategies, first sequenced genome, Human Genome Project, genome mapping, genotyping.</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>activity/problem tasks during the lecture</td><td>0.0%</td><td>13.0%</td></tr>
<tr><td>essay or presentation</td><td>0.0%</td><td>27.0%</td></tr>
<tr><td>test</td><td>0.0%</td><td>60.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Genomy, Brown T.A., PWN, new edition
2. Podstawy Biologii Komórki, Alberts B. i inni, PWN 2009
3. Biochemia, Stryer L. PWN, new edition
4. Genetyka molekularna, red. Węgleński P., PWN 2008</td></tr>
<tr><td>Supplementary literature</td><td>online sources provided by the instructor during classes (updated annually)</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>Pass components:

1. activity in the discussion, activity during the lecture, problem task during the lecture

2. essay or presentation featuring one of the proposed topics

3. test containing single-choice test questions, problem questions, diagrams</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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