

Subject card

Subject name and code	Molecular genetics, PG_00179529						
Field of study	Chemistry						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
Education level	Master's studies	Subject group			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			2.0		
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-Frańkowiak				
	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						
	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	20.0	55		
Subject objectives	<ol style="list-style-type: none"> 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_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			
	[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			

Subject contents	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.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	0.0%	60.0%
	essay or presentation	0.0%	27.0%
	activity/problem tasks during the lecture	0.0%	13.0%
Recommended reading	Basic literature	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	
	Supplementary literature	online sources provided by the instructor during classes (updated annually)	
	eResources addresses		
Example issues/ example questions/ tasks being completed	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		
Work placement	Not applicable		

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