

Subject card

Subject name and code	Molecular genetics, PG_00211778						
Field of study	Forensic Analytics						
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 Optional subject group		
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	Laboratory of Bionanotechnology -> Department of Molecular Biotechnology -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Joanna Jeżewska-Frąckowiak				
	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: 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		15.0	50
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
	[AKRL3_K01] The graduate is prepared to critically evaluate their own knowledge and its relevance to solving cognitive, practical, and societal problems, as well as to responsibly make use of expert opinions.	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
	[AKRL3_U08] The graduate is able to prepare oral and written presentations and reports in Polish and in chosen foreign language, as well as present and evaluate different viewpoints and engage in discussion in those languages.	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
	[AKRL3_W12] The graduate knows and understands, at an advanced level, the latest trends and achievements in analytical chemistry, toxicology, molecular biology and instrumental methods used in forensic science.	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
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		