University of Gdańsk

Subject card

Subject name and code	Multicellular organisms - Genetics Methodology (M04_B1), PG_00197625						
Field of study	Biotechnology						
Date of commencement of studies	October 2025		Academic year of realisation of subject	2026/2027			
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	1.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Laboratory of Plant Protection and Biotechnology -> UG Institute of Biotechnology -> Intercollegiate Faculty of Biotechnology UG-MUG -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Anna Ihnatowicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	12.0	0.0	0.0	0.0	12
	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	12		2.0	11.0	25	
Subject objectives	The student, by completing the program block, will learn the mechanisms of development and symptoms of disorders of the discussed processes, including chromosomal aberrations and human genetic diseases. The aim of the exercises is to use the acquired knowledge during solving tasks and analyzing selected genetic processes, including the use of basic statistical methods used in biotechnology. The student will have the opportunity to develop the ability to speak and lead discussions, using specialist terminology and conceptual apparatus appropriate for biotechnology and will understand the need to provide society with information about the achievements of biotechnology in the diagnosis and treatment of genetic diseases, prenatal diagnosis, personalized medicine and others.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOTECHL3_U07] The graduate is able to prepare and present a short oral presentation in Polish and/or English, covering detailed issues in the field of biotechnology, using scientific language, and is able to conduct discussions	The student will have the opportunity to develop the ability to speak and lead discussions using specialized terminology and conceptual apparatus appropriate to biotechnology and genetics. Will understand the need to provide the public with information about the achievements of biotechnology in the diagnosis and treatment of genetic diseases, prenatal diagnosis, personalized medicine and others.	[SU1] oral statement/conversation/ discussion [SU8] observation of student's independent or team work
[BIOTECHL3_U03] The graduate applies mathematical and statistical methods to describe phenomena and analyze data and is able to use professional databases used in biotechnology.	The student applies basic mathematical and statistical methods to describe phenomena and analyze data, including the analysis of selected genetic processes; has the ability to perform basic data analysis in professional databases used in biotechnology.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
[BIOTECHL3_K05] The graduate is willing to understand the need to inform the society about the achievements of biotechnology important for the improvement of health and quality of life.	The student understands the need to provide the public with information about biotechnology achievements important for improving health and quality of life, including information about biotechnology achievements in the diagnosis and treatment of genetic diseases, prenatal diagnosis, personalized medicine, and others.	[SK1] oral statement/conversation/ discussion [SK8] observation of student's independent or team work

Subject contents

Genetics of higher organisms:

Solving genetic crosses, probability, statistical tests. Diseases caused by chromosomal aberrations. Karyotypes. Pedigree analysis. Inheritance of blood groups. Examples of the use of genetic and molecular markers in molecular breeding, genetic counseling, forensics, and criminology. Application of genetic techniques to construct maps showing gene positions. Experimental mapping populations - examples in various types of organisms. Application of molecular biology techniques to study DNA molecules (restriction mapping, fluorescence in situ hybridization, mapping of sequence-labeled sites). QTL mapping. Normal distribution. Study of heritability in the broad and narrow sense. GWAS. The impact of progress in sequencing techniques on the development of genetic research. Model organisms in genetic research - databases. Directions of development of gene therapies.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test/exam - written	51.0%	100.0%

Recommended reading

Basic literature

- Genomy, Autor: Terence A. Brown Współtwórca: Piotr Węgleński (redaktor naukowy), Wydanie: 4, 2019
- Genetyka molekularna, Autor: Piotr Węgleński, Wydawnictwo Wydawnictwo Naukowe PWN, 2021
- Krótkie wykłady Genetyka. Autorzy: Ivor Hickey, Hugh Fletcher, 2021
- Krótkie wykłady. Genetyka. Autorzy: Ivor Hickey, Hugh Fletcher (ebook)

Supplementary literature

- Genetyka medyczna, Podręcznik dla studentów, Redakcja naukowa: Gerard Drewa, Tomasz Ferenc, Wydanie: Wrocław, 2021, Wydawca: Edra Urban & Partner
- 50 idei, które powinieneś znać. GENETYKA (eBook), Autor: Mark Henderson , Wydanie: 1, 2020, Wydawca: Wydawnictwo Naukowe PWN
- Hartl D.L., Ruvolo M. Genetics: Analysis of Genes and Genomes, wyd. VIII, Jones and Bartlett Publisher 2011
- Schaum's Outline of Genetics, Fifth Edition (Schaum's Outlines) 5th edition by Elrod, Susan, Stansfield, William (2010)

eResources addresses

Example issues/ example questions/ tasks being completed	--
Work placement	Not applicable

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