University of Gdańsk

Subject card

Subject name and code	Genetics with elements of genetic diseases, PG_00203398		
Field of study	Medical Biology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master'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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Medical Biology and Genetics -> Faculty of Biology -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Magdalena Gabig-Cimińska	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	0.0	0.0	20
	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	20	3.0	27.0	50

Subject objectives	
	1. Introduction of new concepts in human genetics and genetic diseases. 2. Familiarization with molecular mechanisms responsible for the development of genetic diseases. 3. Study of modern and the latest methods of prevention, diagnosis, and treatment of genetically determined diseases.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLMEDMU2_K02] is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek expert advice when having difficulty solving a problem on his own	Recognizes the importance of knowledge in solving cognitive and practical problems in the field of human genetics and seeks expert opinions when encountering difficulties in solving a problem independently	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written [SK8] observation of student's independent or team work
[BIOLMEDMU2_K07] is able to form opinions on various aspects of professional practice and is also able to foster entrepreneurship and innovation in their professional work	Is prepared to formulate opinions on various aspects of human genetics	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written [SK8] observation of student's independent or team work
[BIOLMEDMU2_W02] is familiar with current issues in medical biology and related disciplines	Is familiar with the currently debated issues concerning human genetic diseases	[SW4] test/exam - oral or written
[BIOLMEDMU2_W01] has an in-depth knowledge of scientific fields and disciplines relevant to medical biology and the studied specialty and knows their main development trends	Has in-depth knowledge of human genetics and genetic diseases, and is familiar with their main developmental trends	[SW4] test/exam - oral or written
[BIOLMEDMU2_U01] is able to use, fluently yet critically, the academic literature and databases required for work in the field of medical biology and related disciplines, and to prepare and present academic papers in the field of medical biology and related sciences	Is proficient in critically using scientific literature and genetic databases	[SU4] test/exam - oral or written
[BIOLMEDMU2_W03] has an in-depth understanding of the structure and functions of the human body, the biological causes of disorders, pathological changes and social dysfunctions, and the methods used to assess them using modern and current biochemical, molecular, parasitological or neurobiological techniques	Understands the structure and functions of the human genome, the genetic causes of disorders and diseases, and the methods for assessing them using molecular techniques	[SW4] test/exam - oral or written
[BIOLMEDMU2_U08] can independently plan and implement his own lifelong learning and guide others in doing so	Independently plans and continues lifelong learning and inspires others to do the same	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written [SU8] observation of student's independent or team work

Subject contents

1. Fundamentals and the most advanced achievements in molecular genetics.
2. Innovative research on the genetic foundations of diseases and their latest implications.
3. Pioneering therapies for genetic diseases.
4. Artificial intelligence and bioinformatics in genetics and human genetic diseases.
5. Synthetic genetics as the future of molecular biology and genetic engineering.
6. Personalized medicine based on genetic profiles and global databases and data banks.
7. Interdisciplinary integration of genetics with other sciences for a comprehensive understanding of genetic diseases.

Prerequisites and co-requisites

Basic knowledge of biochemistry, molecular biology, and genetics. Additionally, the student should have fundamental knowledge in pathophysiology, pathology, pharmacology, clinical chemistry, and laboratory diagnostics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Subject Written test (closed and open questions), covering lecture material, assessed according to the percentage indicator (UG Study Regulations)	51.0%	100.0%

Recommended reading	Basic literature	1. Jorde LB, Carey JC, Bamshad MJ, Genetyka medyczna, red. wyd. polskiego Maciej Borowiec, wydanie 6, Edra Urban&Partner, 2021. 2. Genetyka medyczna i molekularna, red. J. Bal, Warszawa, Wydawnictwo Naukowe PWN, 2017. 3. Tobias E. S., Connor M., Ferguson-Smith M., Genetyka medyczna, red. wyd. pol. A. Latos-Bielenska, Warszawa, PZWL Wydawnictwo Lekarskie, 2013. 4. Lucchesi JC. Epigenetyka. PWN, Warszawa, 2022. 5. Drewa G, Ferenc T. Genetyka medyczna, Wrocław, 2011.
	Supplementary literature	1. Fletcher H, Hickey I, Krotkie wykłady: Genetyka, PZWL 2021. 2. Weglenski P. Genetyka molekularna, wydanie VI, PWN, 2020. 3. Genetyka kliniczna nowotworow, red. J. Lubinski, Szczecin, Print Group, 2018. 4. Medycyna personalizowana, red. A. Fronczak, Warszawa, Oficyna Wydawnicza Warszawskiego Uniwersytetu Medycznego, 2016. 5. Brown T. A., Genomy, Warszawa, Wydawnictwo Naukowe PWN, 2019.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Genetic diseases are panethnic, which means that: A. they have a migratory nature; B. they relate only to a selected ethnic group; C. they occur worldwide, regardless of previously established divisions into nations, tribes, religions, and languages; D. they have a national character, meaning they are specific to certain cultural and historical groups. Complete: o The most common mitochondrial disease in children is considered to be .....,while in adults it is	
Work placement	Not applicable	

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