University of Gdańsk

Subject card

Subject name and code	Essential Genetics, PG_00203324						
Field of study	Medical Biology						
Date of commencement of studies	October 2026		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	1		Language of instruction	Polish			
Semester of study	1		ECTS credits	1.0			
Learning profile	academic		Assessment form	exam			
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Anna Wysocka				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		2.0		8.0	25
Subject objectives	To familiarize students with the basic issues of genetics, in accordance with the current state of knowledge in this field. Deepening knowledge and understanding of the basic laws of heredity and the basis of genetic variation. To provide knowledge on the mechanisms of gene functioning and interaction, understanding the relationship between genotype and phenotype. Presentation of modern research methods and development of the ability to ask questions, make assessments and solve uncomplicated problems.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLMEDL3_W16] has an advanced knowledge of the experimental methods and the most important techniques of biological sciences that can be applied to medical biology and diagnostics	explains the theoretical basis of experimental methods and lists the most important genetic techniques that can be used in biology medical and diagnostic	[SW4] test/exam - oral or written
[BIOLMEDL3_W06] at an advanced level: describes, explains and compares systemic control mechanisms in animal and human organisms (including onto- and phylogenetic points of view) and the neurobiological and genetic basis of different disorders	knows the genetic basis of disorders (traits) in animal and plant organisms	[SW4] test/exam - oral or written
[BIOLMEDL3_W02] has an advanced knowledge and understanding of the structure and properties of basic types of biological macromolecules, molecular mechanisms of the pathways of basal metabolism and flow of genetic information, and sources of variation in organisms; explains the rules of inheritance	describes the mechanisms and sources of variability of organisms; explains the rules of inheritance	[SW4] test/exam - oral or written
[BIOLMEDL3_U05] synthesises data from different sources and draws appropriate conclusions from them	synthesise data from different sources and draw on this basis the appropriate conclusions	[SU1] oral statement/conversation/ discussion
[BIOLMEDL3_U06] reads with understanding scientific texts in Polish and simple texts in English in the field of medical biology; independently searches and uses available sources of information, including electronic sources	can read and understand scientific texts in Polish and simple texts in English in the field of genetics; independently searches for and uses available sources of information, including electronic	[SU1] oral statement/conversation/ discussion
[BIOLMEDL3_K05] jest odpowiedzialny za bezpieczeństwo pracy własnej i innych oraz potrafi rozpoznać sytuacje zagrożenia i podjąć odpowiednie działania	is responsible for the safety of his/ her own and others' work and is able to identify emergency situations and take appropriate action	[SK8] observation of student's independent or team work

Subject contents

Mendelian inheritance with examples in plants, animals and humans. Inheritance inconsistent with Mendel's rules. Basic properties of genes (e.g. gene penetrance, trait expressivity, pleiotropy, modification, genetic anticipation). Multiple alleles. Interaction of allelic and non-allelic genes. Lethal genes. Sex-linked, sex-influenced, and sex-limited inheritance. Inheritance of lineage traits. Gene mapping methods. Inheritance of quantitative traits. Multifactorial inheritance. Behavioral genetics. Mutagenesis. Genetic imprinting. Extranuclear inheritance in Eucaryota. Genetic structure of the population. Genetic equilibrium. Factors influencing allele frequency in populations.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
final test (exam)	51.0%	100.0%

Recommended reading

Basic literature

Bal J. Molecular biology in medicine Elements of clinical genetics. PWN Warsaw, 2011.Boczkowski K. Outline of medical genetics. PZWL Warsaw, 1990.Brooker R. (ed.) Genetics: Analysis and Principles, 6-th edition. Mc Graw Hill. 2017Charon K. M., Świtoński M. Animal genetics. PWN Warsaw, 2006.Charon K. M., Świtoński M. Genetics and genomics of animals. PWN Warsaw, 2019Krebs J.E., Goldstein E.S.,. Kilpatrick S.T. Lewin's GENES XII . Jones & Bartlett Learning; 12th Edition. 2017.Oniszczenko W., Dragan W.Ł. Genetics of behavior in psychology and psychiatry. Wydawnictwo Naukowe SCHOLAR, Warsaw, 2008.Piątkowska B., Goc A., Dąbrowska G. A collection of tasks and questions in genetics, vol. I General genetics. NCU Publishing House, Toruń 1998. Węgleński P.: Molecular genetics. PWN Warsaw, 2012

	Supplementary literature	Korf B. R. Human genetics. Solving medical problems. PWN Warsaw, 2003.Plomin R., Defries J.C., Mc Cleam G.E., McGuffin P. Genetics of behavior. PWN Warsaw, 2001Wysocka A., Lipowska M., Kilikowska A. 2010. Genetics in solving dyslexia puzzles: the overview. Acta Neuropsychologica, 8(4): 315-331Wysocka A., Lipowska M. 2010. Genetic basis of the co-occurrence of ADHD and developmental dyslexia. Psychiatry and Clinical Psychology, 10 (3): 188-193
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Indicate an falsh sentence:a. in complete dominance, the dominant allele manifests itself phenotypically in heterozygousb. in incomplete dominance, the heterozygote manifests an intermediate trait value between the phenotypes of both homozygotesc. codominance is a type of allelic cooperationd. in incomplete dominance, heterozygotes always show a dominant trait,2. Karyotype 47, XYY is an example: A. Monosomy C. Euploidy B. Polyploidy D. Aneuploidy	
Work placement	Not applicable	

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