University of Gdańsk

Subject card

Subject name and code	Molecular ecology, PG_00198097						
Field of study	Natural Resources Conservation						
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 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	3		ECTS credits	1.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Laboratory of Mammalian Evolutionary Genomics -> Department of Evolutionary Genetics and Biosystematics -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Małgorzata Pilot				
	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		3.0	7.0	25	
Subject objectives	1. Introduction of new terms and research methods of molecular genetics related to multidisciplinary molecular ecology. 2. Understanding the cognitive importance and practical applications of molecular ecology.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OZPL3_K01] The graduate is ready to recognise the limitations in his/her own knowledge and understands the need for continuous learning and development	- The graduate knows the limits of his own knowledge and understands the need for constant learning and development	[SK1] oral statement/conversation/ discussion
[OZPL3_W09] The graduate possesses an advanced comprehension of the current state of knowledge and the latest trends in protection of natural resources, as well as their relationship to other natural disciplines	- The graduate possess the current state of knowledge about trends in molecular ecology and indicates their relationship with other natural disciplines	[SW4] test/exam - oral or written
[OZPL3_W13] The graduate has an advanced understanding of the rules, methods, and techniques of environmental research and their potential applications in nature conservation	- The graduate can present the basic rules, methods and techniques of conducting research on the natural environment and the possibilities of their use in nature conservation	[SW4] test/exam - oral or written
[OZPL3_U02] The graduate can read with comprehension scientific texts in the field of natural sciences in Polish and simple texts in English	- The graduate reads with understanding scientific texts in the field of molecular ecology in Polish and simple texts in English	[SU4] test/exam - oral or written
[OZPL3_W02] The graduate possesses advanced knowledge and understanding of the mechanisms governing the flow of genetic information, its regulation, the principles of inheritance, and the origins of variation in organisms	- The graduate knows the tools and latest techniques of molecular genetics applied in ecological research	[SW4] test/exam - oral or written
[OZPL3_K08] The graduate is ready to systematically update his/ her natural knowledge and to apply it in practice	- The graduate systematically updates the knowledge of nature and knows its practical applications	[SK1] oral statement/conversation/ discussion

Subject contents

- History of molecular ecology; - Theoretical basis of molecular ecology: population genetics; - Application of molecular genetics tools in ecological research: molecular markers and novel molecular techniques; - Use of molecular data for genetic analysis of populations; - Application of the Next Generation Sequencing (NGS) in molecular ecology; - Application of molecular ecology in taxonomic studies; - Basic aspects of phylogeography and landscape genetics; - Molecular ecology in nature conservation; - Practical application of molecular ecology

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test	51.0%	100.0%

Recommended reading

Basic literature	- Freeland J.R. 2020. Molecular Ecology, Third Edition. ISBN: 978-1-119-42615-8; John Wiley & Sons, Ltd; - Rowe G., Sweet M., Beebee T. 2017. An introduction to Molecular Ecology. ISBN: 9780198716990; Oxford University Press
Supplementary literature	Węgleński P. 2020. Genetyka molekularna. ISBN: 978-83-01-14744-0; PWN Warszawa
eResources addresses	

Example issues/ example questions/ tasks being completed	- What are the potential sources of DNA for molecular research?; - What are the main applications of DNA barcoding?; - What are the causes of outbreeding depression?; - What factor determines the rate of heterozygosity loss in a population due to genetic drift?; - What are the main consequences of the bottleneck effect?; - What is the founder effect?; - How does the rate of migration between populations affect the degree of genetic variation between them?; - What mechanisms lead to genetic differentiation of populations?; - How are Evolutionarily Significant Units determined?
Work placement	Not applicable

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