University of Gdańsk

Subject card

Subject name and code	Introduction to molecular evolution, PG_00139885		
Field of study	Biology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	postgraduate studies	Subject group	Obligatory subject group in the field of study Optional subject group 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	1.0
Learning profile	academic	Assessment form	
Conducting unit	Faculty of Biology		
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 learn the basic issues of molecular evolution; Expanding knowledge about the possibilities of using molecular theory as a tool to understand the degree of evolutionary relatedness of organisms.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLMU2_U01] the graduate is able to select and apply research techniques and tools appropriate to the problems of the biological sciences specialisation studied	classifies molecular markers used in phylogenetic studies	[SU1] oral statement/conversation/ discussion [SU8] observation of student's independent or team work
[BIOLMU2_U03] the graduate can critically analyse and select biological information, especially from electronic sources	discusses the pros and cons of using the DNA barcoding approach to species identification	[SU1] oral statement/conversation/ discussion [SU8] observation of student's independent or team work
[BIOLMU2_W08] the graduate is familiar with the wealth of contemporary experimental approaches and techniques in the biological sciences and their use to solve the tasks at hand	is familiar with modern molecular techniques in the study of molecular evolution	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMU2_W04] the graduate has an in-depth knowledge of the chosen specialisation in the biological sciences	defines the basic concepts of molecular evolution; describes hypotheses for the evolution of the genetic code; explains the molecular clock hypothesis	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMU2_K01] the graduate is ready for initiative and independence of action and feels the need for lifelong learning	is oriented towards expanding knowledge in the field of molecular evolution	[SK8] observation of student's independent or team work

<table>
<tr><td>Subject contents</td><td colspan="3">Selected issues in the field of molecular evolution: from Darwinian evolution to molecular evolution; molecular markers and techniques in molecular evolution studies; diversity and variability of DNA sequences in the genome; extranuclear DNA, evolution of organellar genomes; the concept of the molecular clock and the rate of substitution; neutral mutation theory; genealogies of genes and species; the evolution of introns; the nature of the code genetic and hypotheses of its evolution; evolution of proteins with varying degrees of structural-function dependence; molecular evolution in biodiversity research (DNA barcoding approach); ancient DNA.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="3"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>students activity in the class</td><td>0.0%</td><td>20.0%</td></tr>
<tr><td>final test</td><td>51.0%</td><td>80.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td>Basic literature</td><td colspan="2">Futuyma DJ. (2008). Evolution. University of Warsaw Press.Higgs PG., Attwood TK. (2008). Bioinformatics and molecular evolution (ed. K. Murzyn). PWN Warszawa.Bromhan L. 2008. An intraduction to molecular evolution and phylogenetics. Oxford University Press.Avise J.C.: Molecular markers, natural history, and evolution. (2008). University of Warsaw Press</td></tr>
<tr><td></td><td>Supplementary literature</td><td colspan="2">Graur D., Li WH. (2000) Fundamentals of Molecular Evolution. Sinauer Associates, INC., Sunderland, Massachusetts.Brooker RJ. (2009). Genetics: Analysis & Principles, MCGraw-Hill Higher Education.Kubicz A. (1999). Mysteries of molecular evolution. PWN Warsaw-Wroclaw</td></tr>
<tr><td></td><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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