University of Gdańsk

Subject card

Subject name and code	Medical applications of population genetics, PG_00147012		
Field of study	Genetics and Experimental Biology		
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 Molecular Evolution and Bioinformatics -> Department of Evolutionary Genetics and Biosystematics -> Faculty of Biology -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Aleksandra Naczk	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	15.0	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

To familiarise students with molecular research methods in population genetics.

To learn the basic terminology, tools and steps of molecular data analysis in population genetics.

To introduce issues in the applications of population genetics in medicine, forensics and archaeology.

To provide an understanding of quantitative traits and their impact on population genetic structure.

To familiarise students with the issue of nutrigenomics.

To provide a basis for critical reflection on selected problems in contemporary human genetics.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GBEL3_W06] A graduate has an advanced knowledge and understanding of: the development and current state of knowledge and the latest trends in molecular genetics and related fields; indicates their relationship to other disciplines in the life sciences or medical sciences and their potential for use in practice	- is familiar with the development and current state of knowledge and the latest trends in population genetics and related fields; indicates their relationship to other disciplines in the natural or medical sciences and the possibilities of their use in practice	[SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
	[GBEL3_W05] A graduate has an advanced knowledge and understanding of: principles for planning research based on the achievements of biological sciences and related disciplines and the possibility of putting their results into practice, principles for the operation of equipment and apparatus used in molecular genetics research, and the principle of interpreting biological phenomena and processes based on empirical data in research work and practical action, taking into account the sustainable use of biodiversity.	- knows the principles of planning population genetics research and how to use their results in practice	[SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
	[GBEL3_W03] A graduate has an advanced knowledge and understanding of: molecular mechanisms of genetic information transfer and gene expression and the molecular and genetic basis of human physiology and disease, including infectious diseases.	- knows the molecular mechanisms of genetic information transfer and the genetic basis of variation in allele frequency in populations	[SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
	[GBEL3_U07] The graduate is able to: work as part of a team and organise work in accordance with the principles of occupational health and safety and ergonomics.	- can work as part of a team and organise its work	[SU5] implementation of a problem task
	[GBEL3_U02] The graduate is able to: use computer programmes for analysis and calculation, and use databases and bioinformatics tools to solve biological problems.	- is able to use computer programs to perform basic statistical and bioinformatics analyses in the field of population genetics	[SU3] text preparation/written work [SU5] implementation of a problem task [SU6] demonstration of practical skills
	[GBEL3_U01] The graduate is able to: independently perform practical tasks in the biological and related sciences, formulate research problems, analyse their results and draw conclusions.	- is able to independently carry out simple practical tasks in the field of genetics populations, analyse their results and draw conclusions	[SU3] text preparation/written work [SU5] implementation of a problem task [SU6] demonstration of practical skills
	[GBEL3_K07] The graduate is prepared to: lifelong learning and updating of knowledge in molecular genetics and other fields.	- updates knowledge of population genetics and knows its practical applications	[SK3] text preparation/written work
	[GBEL3_K01] The graduate is prepared to: use of theoretical knowledge in laboratory and production practice	- is ready to apply theoretical knowledge of population genetics in practice	[SK5] implementation of a problem task [SK6] demonstration of practical skills

<table>
<tr><td>Subject contents</td><td>Exercise topics:

Statistical methods in the analysis of genetic data, especially SSR microsatellites.

Assessment of the level of variation and genetic structure of human populations.

Population genetics in forensics and archaeology.

Nutrigenomics.

Contemporary genetic problems: issues of eugenics and human races.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basics of genetics, 1st year, semester I</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>short test</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>independent work - worksheets</td><td>51.0%</td><td>50.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Avise J.C. 2008. Markery molekularne, historia naturalna i ewolucja. Wydawnictwo Uniwersytetu Warszawskiego, Warszawa.

Friedman J.M, Dill F.J., Hayden M.R., McGillivray B.C. 2000. Genetyka (red. wyd. pol. J. Limon), Urban & Partner.

Futuyma E.J. 2008. Ewolucja. Wydawnictwo Uniwersytetu Warszawskiego, Warszawa.

Hartl D.L. Clark A.G. 2009. Podstawy genetyki populacyjnej. Wydawnictwo. Uniwersytetu Warszawskiego, Warszawa.</td></tr>
<tr><td>Supplementary literature</td><td>- subject matter literature; current scientific journals from around the world</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Analysis of population genetic variation - basic parameters.

Analysis of genetic differences between populations.

Recognition of evolutionary processes acting on a population.

Familiarisation with the procedures to be followed in the development of analytical results for microsatellite DNA in individual identification.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.