

Course title	Fundamentals of Genetics and Evolutionary Biology		
Course code	Semester	ECTS	Lectures/ classes
13.1.1443	winter	3	Lectures: 15 hours+ Lab class: 20 hours
Name of the lecturer and contact	dr Adrianna Kilikowska; adrianna.kilikowska@ug.edu.pl		
Prerequisites	none		
Course description	<p>LECTURE CONTENT:</p> <ul style="list-style-type: none"> • Principles of Mendelian inheritance: dominance and recessivity, independent assortment, multiple alleles, mendelian pedigree patterns • Quantitative characters: penetrance and expressivity, modifier genes and epistatic genes, pleiotropy, polygenic inheritance • The eukaryotic genome and chromosomes in cells: recombination of linked genes, three-factor crosses, extranuclear inheritance • The chromosomal basis of heredity: sex-linked heredity, the Y chromosome, sex determination • Genetic mapping of Mendelian characters and genetic markers • Genetic structure of populations; interactions between the evolutionary forces: mutation, recombination, selection, migration and genetic drift in the context of the patterns and processes of biodiversity at different levels of biological organisation. <p>LABORATORY TRAINING CONTENT:</p> <ul style="list-style-type: none"> • Drosophila melanogaster as a model organism. Crossing experiments using pure breeding strains of D. melanogaster to illustrate a range of inheritance patterns: <ul style="list-style-type: none"> -Mendelian's Laws - Dominance and recessivity -Multiple allele - Modifier genes and epistatic genes -Lethal genes - Sex-linked inheritance. Sex determination -Recombination of linked genes. Three-factor crosses • Polygenic inheritance. Measurement of wing's medial crossvein in D. melanogaster. • Genetic structure of population: Hardy-Weinberg equilibrium. • Genetic structure of population: factors affecting allele frequencies. 		

<p>Learning outcomes</p>	<p>Knowledge:</p> <ul style="list-style-type: none"> - explain important processes, principles and concepts and critically evaluate theories and empirical research within evolutionary biology - describes mechanisms of the flow of genetic information, and sources of variability of organisms; - explain the most important laws and rules in genetics <p>Skills:</p> <ul style="list-style-type: none"> - recalls technical English-language vocabulary in the field of biological sciences in everyday professional / scientific activity - uses basic research equipment and tools, as well as maintains correct order of activities in the laboratory, - conducts observations and performs basic genetic experiments in the laboratory
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