



<b>TITLE OF THE COURSE:</b>	General Genetics
<b>Course code:</b>	BIO3005
<b>Course group:</b>	C
<b>Faculty:</b>	Natural Science
<b>Study program:</b>	Biology and Genetics, Biotechnology
<b>Level:</b>	<i>Bachelor</i>
<b>Semester:</b>	<i>Autumn / Spring</i>
<b>ECTS credits:</b>	6
<b>Language of instruction</b>	English
<b>Course lecturer/s:</b>	A. Paulauskas, V. Tubelytė, V. Mažeika
<b>Short course description:</b>	<p>The aim of this course is to study the principles and major concepts in organisms' heredity and variability. This course starts from analyzing the principles of Mendelian segregation and heredity, and then goes to understanding of genes interactions and the origin of variability of traits in nature. The first half of the course will focus on the basic principles of classical (Mendelian) genetics, while the second half of the course will deal with the modern discoveries of molecular biology and their applications in today's world.</p>
<b>Course content:</b>	<ol style="list-style-type: none"><li>1. Genetic science and its place in the system of natural sciences.</li><li>2. Transmission genetics.</li><li>3. Interactions of allelic genes. Multiple alleles. Interactions of non-allelic genes.</li><li>4. Chromosomal sex determination. Sex linkage. Lethal alleles. Pleiotropy. Sex-limited and sex-influenced traits. Penetrance and expressivity. Quantitative genetics.</li><li>5. Fundamentals of cytogenetic inheritance: cell cycle, chromatin and chromosomes.</li><li>6. Chromosome theory of inheritance: gene linkage and crossing-over,</li><li>7. Genetic information. Genome organization: coding, non-coding DNA, gene families, pseudogenes,</li></ol>



	<p>repetitive sequences. Central dogma of molecular biology.</p> <ol style="list-style-type: none"><li>8. Regulation of gene expression. Genome changes in somatic cells. Epigenetics and genomic imprinting</li><li>9. Genetics of bacteria and bacteriophages. Inheritance in viruses.</li><li>10. Extranuclear inheritance of eukaryotes.</li><li>11. Cloning of genetic material.</li><li>12. Population genetics.</li><li>13. Mutations.</li><li>14. Genetic basis of plant and animal selection.</li></ol>
<b><i>Grading and evaluating student work in class and/or at the final exam:</i></b>	Final examination (50%), mid-term examination (17%) and assessment of laboratory works (33%).
<b><i>Required reading and additional study material</i></b>	<ol style="list-style-type: none"><li>1. Pierce B. A. Genetics: A Conceptual Approach. W. H. Freeman; Seventh edition, 2019.</li><li>2. Snustad D. P., Simmons M. J. Principles of Genetics 7th Edition Willey and Sons. 2015.</li><li>3. Hartwell, L., Genetics : from genes to genomes. New York [N.Y.] : McGraw-Hill. 2011.</li><li>4. Russell P.J. iGenetics A Molecular Approach Third Edition. Benjamin Cummings, 2010</li><li>5. Study material provided by lecturers.</li></ol>
<b><i>Additional information (if applicable)</i></b>	