

Study program: Reproductive biology			
Study level: Master's studies			
Course title: Human genome and epigenetics			
Course code: RB5			
Teacher: Assis. Prof. Dr. Nevena Veličković			
Course status: obligatory			
ECTS: 5			
Requirements:			
Course objectives: The aim of this course is to introduce students to the human genome organization, distribution and function of genes and genetic mechanisms of monogenic and complex genetic diseases.			
Learning outcomes After successful fulfilling of pre-exam and exam obligations student can: differ levels of structural and functional human genome organization and understand the mechanisms of pathogenic mutations, and explain the methodology for gene identification in monogenic and complex genetic diseases.			
Syllabus <i>Theoretical instruction</i> The human genome organization. The organization, distribution and function of RNA genes of the human genome. The organization, distribution and function of the protein coding genes of the human genome. Noncoding regions of the human genome. Human mitochondrial genome. Pathogenic mutations. Identification of the genes in monogenic diseases. Identification of genes determining complex genetic diseases. Molecular pathology. Cancer genetics. Epigenetic mechanisms. Epigenetic reprogramming in the early embryonic stages. <i>Teaching laboratory</i> Practical work. Karyotyping. Pedigree analysis. Molecular markers: the selection of marker systems in diagnostics, population genetics and forensics. Use of internet sources with information on the human genome organization and function: NCBI, OMIM, GENOME. Other forms of teaching (laboratory work). Extraction of DNA from human material. PCR amplification of the genes and gene fragments, analysis of polymorphism by RFLP and/or differences in the length of the PCR product. Determination of genotype.			
Literature 1. Strachan T., Read AP. Human Molecular Genetics 4th edition. Garland Publishing, New York, USA. 2011. 2. Lewis R. Human Genetics: Concepts and Applications, 9th edition, McGraw-Hill Primis, USA, 2009. 3. Allis CD, Jenuwein T, Reinberg D, Caparros ML. Epigenetics. Cold Spring Harbour Laboratory Press, New York, USA, 2007. 4. Tollefsbol T. Handbook of Epigenetics The New Molecular and Medical Genetics, Elsevier, USA, 2011. 5. Turnpenny P, Ellard S. Emerijevi osnovi medicinske genetike. XIII izdanje. Datastatus, Beograd, Srbija. 2009..			
Weekly teaching load		Lectures: 2	Teaching laboratory: 1
Other forms of teaching: 2			
Teaching methods lectures, practical lectures, laboratory work, seminar, tuition			
Evaluation of knowledge (maximum score 100)			
Pre-exam obligation	points	Final exam	points
Student engagement in lectures		Written exam	
Seminar	Up to 10	Oral exam	Up to 60
Tests			
Practical laboratory	Up to 30		