

<b>Study Programme : BSc in Biology</b>			
Degree level: Bachelor degree			
<b>Course Title: Molecular Genetics</b>			
<b>Professor: Dragana Obreht, Mihajla Djan</b>			
<b>Required/Elective Course: required course</b>			
<b>Number of ECTS: 6</b>			
<b>Prerequisites: -</b>			
<b>Course Objective:</b> Molecular Genetics is course that aims to upgrade basic Genetics course and its main objective is learn and understand processes and mechanisms of gene expression regulation phenomenon wich includes different factors at genetic, epigenetic and environmental level. The practical part of course is dedicated to basic molecular genetic techniques.			
<b>Course Outcome:</b> After successfully realized pre-exam and exam obligations student is able to: - distinguish clearly levels of chromatine organization, types of histome modification and recognize heterochromatin dynamics - explain importance of epigenetics in understanding of gene expression regulation and chromatin structure modulation - distinguish clearly phases and regulation mechanisms of cell cycle in Eukaryotes - explain methodology of basic molecular genetic techniques in genome research - predict possible mechanisms of inheritance and construct pedigrees based on given data - demonstrate good laboratory practice and - understand and use molecular genetic terms, use scientific literature and gather information trough the Internet			
<b>Course Content:</b> <i>Theoretical part</i> Chromatin organization and function. Trascriptome analyzis: chromatin modification and gene expression, gene activation and silencing. Mobile DNA elements: role in genome organization and regulation. Epigenetic phenomenons: PEV, transfection, paramutation, imprinting and heterochromatin. Ultarstructure and comparative organization of centromeres and telomeres. Cell cycle regulation. Small RNA molecules and RNAi – biological function. Extranular genomes in Eukaryotes. Molecular methods in genome structural and functional research. <i>Practical part</i> <i>Methods of DNA extraction. DNA quantification. Polymerase Chain Reaction – reaction components, optimisation. PCR amplification of – primers desing and validadtion. PCR-RFLP, ASO-PCR. Product detection – agarose and PAA electrophoresis. Molecular genetic on-line resources – NCBI, NCGR, GRAINGENES, MITOMAP – Web search based on text and sequence data.</i>			
<b>Reading List:</b> 1. Obreht D. Djan M., Tanurdzic M. Molecular Genetics, extended handouts, Faculty of Sciences, Novi Sad, 2009. (in Serbian) 2. Brown TA Genomes 2, Bios Scientific Publishers, Ltd., UK, 2002. 3. Lewin B. Genes IX, Oxford University Press, UK, 2007. 4. Stracham T, Read AP. Human Molecular Genetics 3, Garland Publishing, USA, 2004.			
<b>Total hours:</b>			
Lectures: 2	Practicals:	Other: 2	Student research work:
<b>Methods of instruction:</b> Lectures, Lab. practicals, Computer lab practicals			
<b>Assessment (maximum number of points 100)</b>			
<b>Requirements</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>
Active participation in lectures	-	Final test	50
Active participation in practicals	2	Oral exam	-
Practicals – take home problems	8		
Tests (2)	40		