

Study program: Integrated academic studies of pharmacy			
Type and level of the study program: integrated academic studies			
Course title: SELECTED CHAPTERS IN MOLECULAR BIOLOGY (PhII-SCMB)			
Teacher: Nataša, S. Vučinić			
Course status: elective			
ECTS Credits: 3			
Condition: Biology with human genetics			
Course aim Molecular biology studies the molecular processes that correspond to macromanifestacions in classical biology. The goal of this elective is: - To explain the molecular basis of vital processes - Understanding the structure and function of nucleic acids - Understanding of the central dogma of molecular biology - Understanding the mechanisms of recombination of genetic material - To explain the regulation of gene expression and the basic mechanisms of DNA repair in procaryotes and eucaryotes.			
Expected outcome of the course: Students will understand the basic concepts and use of molecular biology in modern science. They will clarify the structure and biological role of nucleic acids as carriers of hereditary informations and proteins as implementers of such information. Students will understand the biological significance of weak chemical bonds, the genetic code, and will be able to clearly distinguish gene and genome. They will understand the organization of the genome in the nucleus and DNA replication, mechanisms of mutations, principles and mechanisms of DNA repair . Students will learn gene expression and regulation in prokaryotes and eukaryotes and will be able to understand differences in these processes between pro and eukaryotes. They will learn to isolate DNA , RNA , agarose gel electrophoresis and PCR setup.			
Course description <i>Theoretical education</i> 1. 1. Structure and biological role of nucleic acids 2. 2 Structure and biological role of the protein 3. 3 The biological significance of weak chemical bonds 4. 4 The genetic code 5. 5 Gene and genome 6. 6 Genome organization in the nucleus 7. DNA replication. 8. DNA mutations and repair mechanisms. 9. Homologous recombination at the molecular level 10. The expression of the genome 11. Transcription 12. Processing of precursor mRNA 13. Translation 14. Regulation of gene expression in prokaryotes 15. Regulation of gene expression in eukaryotes <i>Practical education</i> 1. DNA isolation 2. RNA isolation 3. Agarose electrophoresis of nucleic acids 4. PCR of selected gene 5. Molecular markers (RFLP, PCR) 6. Forensics. Examples, the use and importance of forensic 7. Workshops 8. Research			
Literature <i>Compulsory</i> 1. Alberts B, Johnson A., Lewis J, Raff M, Roberts K. Walter P. Molecular Biology of the Cell, 4th Ed. Garland Science, 2014 <i>Additional</i> 1. Human Molecular Genetics. Tom Strachan, Andrew Read, 4th Edition. Garland Science, 2011			
Number of active classes			Other:
Lectures: 30	Practice: 15	Other types of teaching:	
Research related activities:			
Teaching methods Lectures and practice			
Student activity assessment (maximally 100 points)			
Pre-exam activities	points	Final exam	points
Lectures	5	Written	60
Practices	5	Oral	
Colloquium		
Essay	30		