

Study program : Pharmacy
Type and level of studies: Integrated academic studies, Level 1/2
Course unit: PHARMACEUTICAL BIOLOGY AND GENETICS
Teacher in charge : Dr Danijela Todorović, associate professor
Language of instruction : ENGLISH
ECTS: 4
Prerequisites: Completed course in pharmaceutical biology and genetics
Semester: WINTER SEMESTER
Course unit objective: Acquiring knowledge and skills in pharmaceutical biology and genetics.
<p>Learning outcomes of Course unit:</p> <ul style="list-style-type: none"> • Knowledge about cell structure; differences between prokaryotic and eukaryotic cells and between plant and animal cells; the morphology and role of the cellular organelles; transport of matter across the cell membrane; organization and function of plant tissues and organs; reproduction of unicellular and multicellular organisms • Knowledge of the human karyotype; organization and function of the human genome, DNA and genes; mechanism of DNA replication; processes in protein synthesis and regulatory mechanisms of gene expression; chromosomal aberrations and mutations; types of inheritance; the basic principles of genetic engineering.
<p>Course unit contents</p> <p><i>Theoretical classes</i> <i>Organization of prokaryotic and eukaryotic cells. Plant and animal cells. Cell organelles. Cell membrane - structure, transport of molecules through the cell membrane. Plant tissues and organs. Reproduction of unicellular and multicellular organisms. Gametogenesis. Organization and function of the human genome. Chromosomes of eukaryotes. Nucleic acids - structure and functions. DNA replication. Protein synthesis - transcription and translation. Regulation of transcription and translation. Gene mutations. Basics of pharmacogenetics and teratogenic agents. Chromosomal aberrations: structural and numerical. Patterns of inheritance. Genetic engineering - recombinant DNA technology.</i></p> <p><i>Practical classes</i> <i>Differences between prokaryotic and eukaryotic cells. Differences in the structure and function of plant tissues and their connection within plant organs and the whole organism. Gametogenesis: solving problems for gametogenesis. Methods in human cytogenetics: direct and short-term cultivation methods. Peripheral blood lymphocyte culture. Methods of human chromosome staining: analysis of human chromosomes stained with ordinary dye and G technique. Tests in genotoxicology. Mendel's inheritance - solving problems. Non-Mendelian inheritance - polygenic and multifactorial inheritance. Recombinant DNA methods in medicine.</i></p>
<p>Literature</p> <ul style="list-style-type: none"> - Shipunov, Alexey. Introduction to Botany. Minot State University, North Dakota, USA, 2020. URL: http://ashipunov.info/shipunov/school/biol_154/textbook/intro_botany.pdf - Turnpenny P, Ellard S. Emery's Elements of Medical Genetics, 15th edition, Elsevier Ltd., UK, 2017. - Lewis R. Human genetics: concepts and applications, 9th edition, Mc Graw Hill, NY,USA, 2010. - Epstein J.E. Human molecular biology, Cambridge University press, UK, 2003.

Number of active teaching hours				Other classes
Lectures: 15	Practice: 30	Other forms of classes:	Independent work:	
Teaching methods: Lectures, practice in a clinic, clinical problems solving				
Examination methods (maximum 100 points)				
Exam prerequisites	No. of points:	Final exam	No. of points:	
Student's activity during lectures	40	oral examination		
practical classes/tests		written examination	60	
Seminars/homework				
Project				
Other				

Grading system		
Grade	No. of points	Description
10	91-100	Excellent
9	81-90	Exceptionally good
8	71-80	Very good
7	61-70	Good
6	51-60	Passing
5	< 51	Failing