

SYLLABUS

Subject:	Medical Biology		
Study Programme:	<i>General Medicine</i>	Study Period:	<i>2. semester</i>
Evaluation:	<i>passing</i>	Subject Type:	<i>mandatory(compulsory)</i>
Content:	<i>2 lecture and 2 exercise hours /week</i>		<i>Total 56 hours</i>

Department: Department of Medical Biology

Week	Lectures	Practical Lessons
1.	Introduction to the study of medical biology. Basic properties, structure and functions of living organisms, molecular and cellular nature of life. Cell structure I - The simplest forms of life - viruses and prokaryotic cells	Microscopy I. – introduction, light microscope, construction of microscope, optical pathway in a compound microscope, adjustment and use of microscope
2.	Cell structure II – eukaryotic cell, cell organelles – their structure and functions	Microscopy II. – microscopic examination of simple objects (printed letters, air bubbles, fingerprint, the use of oil immersion objective)
3.	Cell structure III – eukaryotic cell, cell organelles – their structure and functions	Preparing samples for light microscopy – wet mount, microscopic examination of Protozoa - vital staining, blood smear and print preparation
4.	General characteristic of biomembranes – molecular structure of biomembranes, transport of molecules through the membrane	Biomacromolecules – structure and function of biomacromolecules, purification of nucleic acids, solving tasks and problems.
5.	The structural organization of genome – organization of DNA in genomes, the basic principles of human cytogenetics	Cell structure I. – structure and function of prokaryotic and eukaryotic cell, cell organelles – examination of chloroplasts, cell inclusions, vacuoles, mitochondria
6.	Cell cycle I. – cell cycle, replication and repair of DNA	Cell structure II. – examination of nuclei and nucleoli; evaluation of blood smear
7.	Cell cycle II. – cell cycle, control of cell cycle, mitosis	Cell physiology – transport across membranes, osmosis, plasmolysis and deplasmolysis

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8.	Basics of cell signaling TEST 1	The structural organization of genome – organization of DNA in genomes, making a human karyotype, FISH method
9.	Cell cycle III. – meiosis, spermatogenesis, oogenesis, fertilization in human	Cell cycle I. – cell cycle stages, replication, solving tasks and problems
10.	Cell differentiation, cell ageing and cell death	Cell cycle II. – mitosis, examination of mitotic stages on squashed preparations, examination of human metaphase chromosomes
11.	Gene expression I. – gene structure and function, transcription, post-transcriptional RNA processing	Cell cycle III. – meiosis, genetic consequence of meiosis, gametogenesis, microscopic examination of meiotic stages on fixed mounts
12.	Gene expression II. – translation, synthesis of proteins, posttranslational modifications, regulation of gene expression	Microscopic analysis of cells and tissues I. – cell measurement, counting, and analysis
13.	The basic principles of epigenetics TEST 2	Microscopic analysis of cells and tissues II. – cell measurement, counting, and analysis
14.	Genomics and medicine	Physical and chemical properties of living substances/dermatoglyphics