

SYLLABUS

Subject:	Biology 1		
Study Programme:	<i>General Medicine</i>	Study Period:	<i>1. 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

<i>Week</i>	<i>Lectures</i>	<i>Practical Lessons</i>
1.	Introduction to biology	Microscopy I. – introduction, light microscope, construction of microscope, optical pathway in a compound microscope, adjustment and use of microscope
2.	Biomacromolecules – common characteristics, the structure and function of saccharides, lipids, proteins and nucleic acids	Microscopy II. – microscopic examination of simple objects (printed letters, air bubbles, fingerprint, the use of oil immersion objective)
3.	Cell structure – prokaryotic and eukaryotic cells, cell organelles, their structure and function	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.	<p>Cell signaling</p> <p>TEST 1</p>	<p>The structural organization of genome – organization of DNA in genomes, making a human karyotype, FISH method</p>
9.	<p>Cell cycle III. – meiosis, spermatogenesis, oogenesis, fertilization in human</p>	<p>Cell cycle I. – cell cycle stages, replication, solving tasks and problems</p>
10.	<p>Cell differentiation, cell ageing and cell death</p>	<p>Cell cycle II. – mitosis, examination of mitotic stages on squashed preparations, examination of human metaphase chromosomes</p>
11.	<p>Gene expression I. – gene structure and function, transcription, post-transcriptional RNA processing</p>	<p>Cell cycle III. – meiosis, genetic consequence of meiosis, gametogenesis, microscopic examination of meiotic stages on fixed mounts</p>
12.	<p>Gene expression II. – translation, synthesis of proteins, posttranslational modifications, regulation of gene expression</p>	<p>Microscopic analysis of cells and tissues I. – cell measurement, counting, and analysis</p>
13.	<p>The basic principles of epigenetics</p> <p>TEST 2</p>	<p>Microscopic analysis of cells and tissues II. – cell measurement, counting, and analysis</p>
14.	<p>Genomics and medicine</p>	<p>Physical and chemical properties of living substances/dermatoglyphics</p>