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

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.	**The structural organization of genome** – organization of DNA in genomes, the basic principles of human cytogenetics	**Biomacromolecules –** structure and function of biomacromolecules, purification of nucleic acids, solving tasks and problems.
5.	**General characteristic of biomembranes** – molecular structure of biomembranes, transport of molecules through the membrane	**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.	**Basics of cell signaling** **TEST 1**	**Cell physiology –** transport across membranes**,** osmosis, plasmolysis and deplasmolysis

8.	**Cell cycle II.** – cell cycle, control of cell cycle, mitosis	**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**