CONTENT OF THE SUBJECT

Subject:	**Histology and embryology 1**		
Study	*General medicine*	**Study Period:**	*1st year Summer semester*
Evaluation:	*Absolved (A-E)*	**Subject Type:**	*Compulsory*
Content:	*2 h lectures and 3 h practical exercises / week*		*Total 28/42 hours*

Department: **Department of Histology and Embryology, UPJŠ FM**

Week	***Lectures*** https://portal.lf.upjs.sk/index-en.php	***Practical exercises***
1.	**The subject matter of histology, history of the histology.** **Cytology I** Composition of the cells, intercellular substance and tissue fluid. Structure (EM, biochemical composition) and function of cell membrane, transmembrane transport, receptors.	**Histologic technics** Tissue sampling, fixation, dehydration, clearing, embedding, sectioning, staining and mounting. Light and electron microscopy.
2.	**Cytology 2** Membranous and nonmembranous organels, nucleus and nucleolus, cytoplasmic matrix, cytoplasmic inclusions, cytoskeleton.	**Obsevation under the light microscope:** **Cytology -** the size and shape of the cells ganglion spinale – round cells medulla spinalis – star-shaped cells cerebellum – pear-shaped cells intestinum tenue – goblet cells
3.	**Epithelial tissue I** Covering epithelium, cell junctions – zonula occludens, zonula adherens, macula adherens, nexus. Basement membrane LM and EM structure.	**Epithelial tissue I** simple covering epithelium. pulmo - simple squamous epithelium ren – simple cuboidal epithelium vesica fellea – simple columnar epith. epididymis – pseudostratified columnar epithelium with stereocilia
4.	**Epithelial tissue II** Glandular epithelium: endocrine and exocrine. Secretory and duct portion – structure and function. Types of exocrine secretion. Cells producing steroids, mucus, proteins.	**Epithelial tissue II** trachea – ciliated pseudostratified columnar epithelium ureter – transitional epithelium vagina - stratified squamous nonkeratinized epithelium cutis – stratified squamous keratinized epit.
5.	**Connective tissue proper** Cells, amorphous ground substanve, types of fibers. Classification of connective tissues, loose connective tissue, dense connective tissue, connective tissue with special function.	**Connective tissue I** cutis, papillary layer – loose connective tissue cutis, reticular layer - dense connective tissue irregular histiocytes – intravital staining tendon – dense connective tissue regular

6.	**Cartilage** Cells, fibers, amorphous ground substance. Types of cartilage – hyaline, elastic and fibrocartilage. Perichondrium structure and function.	**Connective tissue II** aorta – elastic tissue textus adiposus nodus lymphaticus - textus reticularis umbilical cord – mucous tissue
7.	**Bone tissue I** Bone cells, bone matrix. Microscopic structure of compact and spongy bone. Periosteum, endosteum. Primary and secondary bone tissue.	**Cartilage** trachea – hyaline cartilage epiglottis – elastic cartilage cartilago fibrosa – fibrocartilage
8.	**Bone tissue II** Endochondral and intramembranous ossification. Haematopoiesis - development of erythrocytes.	**Bone tissue** textus osseus – compact lamellar bone tissue ossificatio – (epiphysis) spongy bone tissue.
9.	**Muscular tissue I** Striated skeletal muscle, light (LM) and electron microscopic (EM) structure. Principle of contraction. Function. Development.	**Ossification** ossificatio – epiphyseal plate endochondral ossification intramembranous ossification
10.	**Muscular tissue II** Cardiac muscle, smooth muscle tissue. LM and EM structure. Principle of contraction. Afferent and efferent nerve endings	**Muscle tissue** lingua – skeletal muscle myocardium – cardiac muscle intestinum tenue – smooth muscle tissue
11.	**Nerve tissue** Neuron and its processes – dendrites and axon, synapses, myelin sheath. Myelinization. Neuroglial cells – astrocytes, oligodendrocytes, microglial cells, ependymal cells.	**Nerve tissue** medulla spinalis – nerve cells, ependymal cells (Nissl staining) cerebrum – glial cells (silver impregnation)
12.	**Embryology I** Developmental principles in the ontogenesis. Gametogenesis, fertilization, zygote, morula, blastocyst, implantation. 1st week of development.	**Blood and blood cells** blood smear – red and white blood cells, platelets
13	**Embryology II** 2nd and 3rd week of human development. Primitive streak, development of mesoderm, notochord, neurulation. Somites. Primitive cardiovascular system.	**Haematopoiesis** Bone marrow structure and development. Development of erythrocytes.

14.	**Final semestral test**	**Credit week** **Examination of slides**