



**“CAROL DAVILA” UNIVERSITY
OF MEDICINE AND PHARMACY BUCHAREST**
Faculty of Dentistry
Dental Medicine in English



DISCIPLINE GRID

1. Programme:

1.1.	CAROL DAVILA UNIVERSITY OF MEDICINE AND PHARMACY BUCHAREST
1.2.	FACULTY OF DENTISTRY /2 nd DEPARTMENT
1.3.	DIVISION: HISTOLOGY
1.4.	STUDY DOMAIN: Health, sectoral regulated within European Union
1.5.	STUDY LEVEL: LICENCE
1.6.	STUDY PROGRAMME: DENTAL MEDICINE IN ENGLISH

2. Discipline:

2.1.	DISCIPLINE NAME: Histology						
2.2.	LOCATION: Faculty of Medicine, Eroilor Sanitari Blvd., 1 st Floor						
2.3.	Lectures tenure: Assoc.Prof. Mihnea-Ioan NICOLESCU (MD, DMD, PhD)						
2.4.	Practical classes tenure: Assoc. Prof. Mihnea-Ioan NICOLESCU (MD, DMD, PhD) Assistant Prof. Iulia ROATEȘI (DMD, PhD) Assistant Prof. David REMBAS (MD, PhD student)						
2.5.	I	2.6.	II	2.7.	Written/Oral Examination	2.8. Type of discipline	CD / FD
Study year		Semester		Evaluation			

3. Estimated total time (hours/semester)

No. hours/week	4	out of which	Lectures: 2	Laboratory session: 2
Total hours out of learning schedule	56	out of which	Lectures: 28	Laboratory sessions: 28

Time distribution	hours
Textbook study, lecture support, bibliography and notes	28
Supplementary documentation activity in the library, on online platforms	6
Practical activity support material, homework, portfolio and essays	6
Tutorial activity	1
Examinations	2
Other activities	1
Total hours of individual study	44
Total hours per semester	100
Credits	4

4. Preconditions

4.1. curriculum	<ul style="list-style-type: none"> - basic notions of biology (the composition and fundamental functions of the human body) - knowledge of the microscopic organization of the cell, as a component of the tissues and organ systems of the human body.
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4.2. proficiencies	<ul style="list-style-type: none"> - notions of cellular, molecular biology and cytology (knowledge about the structure and functions of different cells in the human body) - the ability to correctly use the optical microscope for examining permanent microscopic preparations
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5. Conditions

5.1. for lecture activity	Amphitheater (capacity: minimum 120 seats), with audio-video system (microphone, amplification station, speakers, video projector with laptop connection possibility, projection screen) and internet access (WiFi, secured)
5.2. for laboratory activity	<ul style="list-style-type: none"> - Laboratory of histological technology for obtaining permanent microscopic preparations, equipped with specific apparatus for fixing, dehydrating, including, sectioning, staining, mounting, labelling and accessories, including but not limited to: microscopes with various objective lenses, histological processing unit, staining battery of histological preparations, microtome for paraffin, temperature-adjustable thermostat, refrigerator-freezer, histological collection, instruments, reagents, glassware and necessary consumables - Microscopy rooms with light microscopes with 4x, 10x, 20x, 40x, 100x objectives (capacity: minimum 40 workstations/room), video projection system (video projector with laptop connection possibility, projection screen) and internet access (Wi-Fi, secured) - Capture and broadcast system from the light microscope - Didactic microscopy slides - Multimedia interactive platform

6. Accumulated skills

6.1. Proficiencies <i>(knowledge and abilities)</i>	<p>I. Knowledge (cognitive dimension)</p> <ul style="list-style-type: none"> - Notions of general histology (fundamental <u>knowledge</u> regarding the microscopic structure and the functions of tissues, organs and systems in the human body) - Notions of special histology (<u>knowledge</u> on the relationship between microscopic structure and cell functions at the level of light microscopy in specific tissues and organs). - In-depth knowledge of cytology and oral histology (<u>knowledge</u> of the microscopic structure of organs and content of the oral cavity, necessary for the subsequent understanding of their pathological changes) <p>II. Abilities (functional dimension)</p> <ul style="list-style-type: none"> - <u>Ability</u> to use the light microscope correctly for the examination of slides with smears or permanent microscopic preparations - <u>Ability</u> to recognize and distinguish the fundamental characteristics of cells by examining preparations under light microscopy - <u>Ability</u> to identify structurally and ultrastructurally the tissues of the oral and maxillo-facial areas
6.2. Transversal skills <i>(role, professional and personal development)</i>	<p>III. Role skills</p> <ul style="list-style-type: none"> - Development of the capacity to analyse, synthesize and use appropriately and coherently the acquired knowledge - Critical analysis and communication in specific medical language of some concepts, hypotheses or scientific results - Development of evaluation and self-evaluation capacity <p>IV. Professional and personal development skills</p> <ul style="list-style-type: none"> - Awareness of the need for continuing education through translational education - Training students to learn to work in teams to solve problems - Development of students' ability to identify valid bibliographic sources and the formation of skills for their correct and efficient use in carrying out scientific papers (poster, article, presentation) - Training students' research skills

7. Objectives (based on the grid of acquired specific skills)

7.1. General Objective	<ul style="list-style-type: none"> - Knowledge of the microscopic organization of the cell, tissues, organs and systems of the human body. - Students' understanding of the molecular basis and the relationship between the structure and ultrastructure of cells and their function in tissues and organs, as a basic element for the approach and subsequent understanding of organ pathology. - Highlighting the correlation between microscopic structure and cell functions as components of tissues and organs. - Highlighting the cellular substrate of the tissues in the oral cavity and the maxillofacial territory.
7.2. Specific Objectives	<ul style="list-style-type: none"> - Development of practical examination skills under the light microscope, proper understanding of use of instruments and equipment specific to the histology laboratory and familiarization of students with modern technologies for tissue processing and examination: electron microscopy, cell cultures, immunohistochemistry etc. - Development of students' ability to recognize the fundamental characteristics of cells, tissues and organs by examination under a light microscope. - Training the ability to use specialized terminology appropriately. - Establishing correlations with future clinical activities in the dental practice.

8. Content

8.1. Lectures	No. hrs/topic	Teaching method	Obs.
1. Epithelial tissue. Surface epithelium: simple and stratified; transitional epithelium. Glandular epithelium.	2	Interactive presentations according to the syllabus, using multimedia and instructional videos	-
2. Connective tissue. Connective cells, fibers; varieties of connective tissues.	1		
3. Cartilaginous tissue. Cartilaginous cells. Cartilaginous matrix. Perichondrium. Varieties of cartilaginous tissue (hyaline, elastic, fibrous). Bone tissue. Bone cells. Bone matrix. Ossification. Correlations of bone remodeling in dentistry.	1		
4. Muscle tissue. Skeletal, cardiac, and smooth muscles. The mechanism of contraction.	1		
5. Nerve tissue. Neurons, glial cells, synapses.	1		
6. The circulatory system. Blood and Haematopoiesis. Arterial vessels, veins, capillaries.	2		
7. The lymphoid organs. Thymus, lymph node, spleen, lymphoid tissue attached to the digestive tract: tonsils, Peyer's patches, ileocecal appendix.	2		
8. Endocrine glands. Pituitary. Epiphysis. Thyroid. Parathyroid. Adrenal. Endocrine pancreas.	2		
9. Respiratory system. Trachea, bronchi, bronchioles, lung, alveolar structure.	2		
10. Urinary system. Kidneys (nephrons, the juxtaglomerular apparatus, mesangium and renal interstitium). Urinary tract: renal pelvis, calyx, ureter, bladder and urethra.	2		
11. The female reproductive system. Ovaries, fallopian tubes, uterus, vagina, mammary glands.	1		

12. The male reproductive system. Testis, genital tract with accessory glands (seminal vesicle, prostate, bulbourethral glands).	1		
13. Skin. Epidermis (keratinocytes, melanocytes, Langerhans cells and Merkel cells). Dermis. Accessory skin structures.	1		
14. Sensory organs. Eye, ear, nose.	1		
15. Digestive tract. Oesophagus, stomach, small intestine, large intestine, the ileocecal appendix.	1		
16. Associated organs of the digestive tract. Salivary glands, liver, gallbladder and exocrine pancreas.	1		
17. Oral histology – hard oral tissues. Stages of tooth crown and root formation. Enamel. Pulp-dentinal complex. Cementum. Alveolar bone. Clinical correlations.	2		
18. Oral histology – soft oral tissues. Oral cavity mucosa. Gingiva. Junctional epithelium. Periodontal ligament. Tongue with taste buds. Clinical correlations.	2		
19. Translational education. Current research directions regarding the structure / ultrastructure of soft/hard oral tissues.	2		

8.2 Laboratory Sessions	No. hrs/topic	Teaching method	Obs.
1. Surface epithelia. Simple squamous, simple cubic, simple cylindrical. Keratinized and non-keratinized squamous stratified epithelium. Cylindrical ciliated pseudostratified epithelium. Transitional epithelium.	1	- interactive slide shows and instructional videos - practical demonstrations - examination of cells and tissues under light microscopy - exercises based on accumulated practical knowledge	-
2. Glandular epithelia. Unicellular exocrine glands (goblet cells). Serous, mucous and mixed acini.	1		
3. Connective tissue. Connective cells and fibers. Varieties of connective tissue: loose connective tissue, dense connective tissue - irregular (dermis) and regular (tendon and aponeurosis). White and brown adipose tissue.	1		
4. Cartilaginous tissue. (hyaline, elastic and fibrous). Bone tissue. Compact bone and spongy bone. Ossification.	1		
5. Muscle tissue. Skeletal, cardiac, and smooth muscles	1		
6. Nerve tissue. Neurons and glial cells. Spinal cord. Cerebellum. The cerebral cortex. The spinal and autonomic ganglia. Myelinated nerve fibers.	1		
7. The circulatory system. Blood. Peripheral blood smear. Blood cells, platelets. MGG staining. Elastic artery, muscular artery, arterioles, venules, capillaries. Heart.	2		
8. Lymphoid organs. Thymus, lymph node, spleen, tonsil.	2		
9. Endocrine glands. Pituitary, epiphysis, thyroid, parathyroid, adrenal, endocrine pancreas.	2		

10. The respiratory system. Trachea and extrapulmonary bronchi. Lung.	2		
11. The urinary tract. Kidney, ureters, bladder.	2		
12. Female reproductive system. The ovary, fallopian tube, uterus, cervix, vagina, mammary gland. Placenta.	1		
13. Male reproductive system. Testis, epididymal canal, vas deferens, seminal vesicle, prostate.	1		
14. Skin. Finger skin, plantar skin. Skin appendages.	1		
15. Sense organs. The eyeball, the inner ear, the olfactory mucosa.	1		
16. Digestive tract. Oesophagus, stomach - fundic and pyloric region, duodenum, jejunum, ileum, colon, ileocecal appendix.	1		
17. Organs associated with the digestive tract. Large salivary glands: parotid, submandibular, sublingual. Accessory salivary glands. Liver, gallbladder, exocrine pancreas.	1		
18. Oral histology. Dry and ground tooth, decalcified tooth, developing tooth. Mucosa of the oral cavity. Lip in sagittal section, tongue (lingual papillae and taste buds)	2		
19. Review of practical notions. Comparative analysis of histological slides under light microscopy. Algorithms for assessing microscopy images.	2		
20. Viva voce / Practical assessment	2	Verification of notions and skills accumulated in practical work	

<p>8.3. Bibliography for lectures and laboratory/practical sessions</p> <p><i>Fundamental notions:</i></p> <ol style="list-style-type: none"> 1. Lectures and practical sessions explanations (digital versions available via e-learning platform) 2. Fehrenbach M & Popowics T. Illustrated Dental Embryology, Histology, and Anatomy. 5th ed. Elsevier, 2020 3. Mescher AL. Junqueira's Basic Histology: Text and Atlas. 16th ed. McGraw-Hill, 2021. <p><i>Advanced notions:</i></p> <ol style="list-style-type: none"> 4. Lowe JS et al. Stevens & Lowe's Human Histology. 5th ed. Elsevier, 2020 5. Gartner L. Textbook of Histology. 5th ed. Elsevier, 2020 6. Pawlina W. Ross Histology: A Text and Atlas. 7th ed. Lippincott Williams & Wilkins, 2015. <p><i>Oral histology:</i></p> <ol style="list-style-type: none"> 7. Berkovitz BKB et al. Oral Anatomy, Histology and Embryology. 5th edition. Elsevier, 2018 8. Chiego D. Essentials of Oral Histology and Embryology. 5th edition. Elsevier, 2018 <p><i>Scientific journals (supplemental):</i></p> <ol style="list-style-type: none"> 9. Journal of Dental Research (ISSN: 0022-0345) 10. Dentistry Journal (ISSN: 2304-6767)
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9. Corroborating the contents of the discipline with the expectations of epistemic community representatives, professional associations and employers in the fields representative for the program

Professional training of students for future years of practice, acquiring the basic notions of structural and ultrastructural architecture of cells, tissues and organs. The use of scientific principles as tools for development of critical analytical thinking.
Translational education through the pedagogical interpretation of scientific results in areas of interest.

10. Evaluation

10.1 Evaluation			
Activity type	Evaluation Criteria	Methods of evaluation	% out of final grade
Lecture	A. Knowledge for mark 5: - basic knowledge of microscopical layout of tissues, as well as their functions B. Additional knowledge for mark 10 - in-depth knowledge of microscopical layout of tissue and organs - presentation of morphological details, understanding the relationship between cells microscopic structure and organ/tissue functions	Continuous assessment Student's activity during the semester (attendance, answers etc.)	10%
		Final exam Theoretical exam consisting of a test with questions covering the entire semester syllabus.	70%
Laboratory Sessions	A. Knowledge for mark 5: - basic knowledge of microscopical layout of tissues, without morphological details B. Additional knowledge for mark 10 - in-depth knowledge of microscopical layout of tissue and organs - presentation of morphological details, understanding the relationship between microscopic structure and organ/tissue functions	Viva voce / Practical assessment - direct examination of two histological slides under a light microscope to verify the practical knowledge acquired by the student, - discussions on the two preparations listed above to verify the acquired knowledge	20%
		Minimum performance standards Elementary knowledge of the microscopic structure of tissues and organs; correct use of the light microscope; correct histological diagnosis of preparations under a light microscope.	

Date:
June 23, 2023

Chair of Histology Division / Lectures tenure:
Assoc. Prof. Dr. Mihnea-Ioan Nicolescu

Date of the approval in Department Board:

Department director,
Prof. Dr. Alexandru Bucur