

## REQUIREMENTS

<p><b>Semmelweis University, Faculty of Dentistry</b></p> <p><b>Name(s) of the Institute(s) teaching the subject:</b> Department of Anatomy, Histology and Embryology</p>
<p><b>A tárgy neve:</b> Mikroszkópos anatómia és fejlődéstan I.</p> <p><b>Angol nyelven<sup>1</sup>:</b> Microscopic anatomy and embryology I.</p> <p><b>Német nyelven<sup>1</sup>:</b> Mikroskopische Anatomie und Embryologie I.</p> <p><b>Credits:</b> 4</p> <p><b>Total number of hours:</b> 56    <b>lectures:</b> 28    <b>practices:</b> 28    <b>seminars:</b> 0</p> <p><b>Type of subject:</b> <u>compulsory course</u>    elective course    optional course</p> <p><b>Frequency of announcement:</b> yearly</p>
<p><b>Academic year:</b> 2021/2022.</p>
<p><b>Subject code<sup>2</sup>:</b> FOKOANT308_1A (NEW CODE)</p>
<p><b>Name of the Course Leader:</b> Dr. Gerber Gábor</p> <p><b>Contact details:</b> Semmelweis University, Department of Anatomy, Histology and Embryology, Budapest 1094 Tűzoltó utca 58. +36-20-428-6143</p> <p><b>Position:</b> Associate Professor, Dr. Habil.</p>
<p><b>Learning objectives, the role of Microscopic Anatomy and Embryology in the medical curriculum:</b> Demonstration of the microscopical structure of the human body to draw parallels with Macroscopical Anatomy and to provide a deeper understanding of the relations between histological structure and function. Identification of general directions/landmarks within digitized tissue slides together with the identification of structures in histological specimens.</p>
<p><b>Place where the subject is taught (address of the auditorium, seminar room, etc.):</b> Semmelweis University, Department of Anatomy, Histology and Embryology Budapest 1094, Tűzoltó utca 58.</p>
<p><b>Successful completion of the subject results in the acquisition of the following competencies:</b> Understanding the microscopical composition and development of the human body. Clear understanding of histological structure and function. Ability to identify basic structural elements within the tissue specimen. To acquire knowledge necessary for subsequent courses.</p>
<p><b>Course prerequisite(s):</b> Cell sciences, cell biology (successful examination)</p>
<p><b>Number of students required for the course (minimum, maximum) and method of selecting students):</b> Obligatory for all registered students, on the basis of registration via the NEPTUN system</p>
<p><b>How to apply for the course:</b> Via the NEPTUN system.</p>
<p><b>Detailed curriculum:</b></p> <p><i>List of lectures</i></p> <ol style="list-style-type: none"> <li>1. Epithelial tissues, cell contacts, intercellular connections</li> <li>2. Glandular epithelium</li> <li>3. Connective tissue cells</li> <li>4. Connective tissue fibres. Types of connective tissue</li> </ol>

5. Supporting tissues (cartilage, bone)
6. Ossification, bone remodelling
7. Muscle tissues I.
8. Muscle tissues II.
9. Histology of vessels
10. Histology of the tongue and salivary glands
11. Tooth development, malformations
12. Histology of teeth I. Enamel and dentine
13. Histology of teeth II. Cementum and dental pulp
14. Histology of teeth III. Parodontal tissues
15. Histology of the esophagus and stomach
16. Microscopical anatomy of the small intestines
17. Histology of the liver, gall bladder and pancreas
18. Microscopical anatomy of the large intestines
19. Histology of the airways
20. Histology of the kidney
21. Histology of urinary passages
22. Histology of the testicle
23. Histology of the spermatic cord, seminal vesicle and prostate
24. Histology of the ovary, oogenesis
25. Histology of the Fallopian tube, uterus and the vagina
26. Histology of the placenta, umbilical cord and the mammary gland
27. Histology summary I.
28. Histology summary II.

#### *Histology laboratories*

Weeks 1-5: Basic tissues (epithelial tissues, connective and supportive tissues, muscles tissues, histology of vessels)

Week 6: Maxillofacial histology (tooth development, histology of salivary glands)

Weeks 7-14: Histology of internal organs (alimentary tract, airways, urinary system, male and female gonads and genital systems)

#### **Other subjects concerning the border issues of the given subject (both compulsory and optional courses). Possible overlaps of curricula:**

Macroscopic Anatomy and Embryology I - II.

*Cell sciences, cell biology*

*Certain chapters of Biochemistry and/or Physiology*

#### **Special study work required to successfully complete the course<sup>4</sup>:**

none

#### **Requirements for participation in classes and the possibility to make up for absences:**

Active participation in practical lessons/dissection room sessions is obligatory for every student. Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester. Absences cannot be made up for.

#### **Methods to assess knowledge acquisition during term time<sup>5</sup>:**

During the semester the knowledge of the students will be evaluated in a written (e-learning type) and/or oral midterm test. Attendance is obligatory at the midterm test. Students absent from the midterm test should reattend at a given timepoint or their semester will not be accepted. The time and topics of the midterm test will be announced in the departmental homepage at the beginning of the semester (<http://semmelweis.hu/anatomia>).

#### **Requirement for signature:**

Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester. Students should successfully pass the obligatory midterm test or their semester is not accepted. Unsuccessful midterms may be repeated at two given timepoints during the last two weeks of the semester.

**Type of examination:**

Semifinal examination, topics: subject matter of the semester (Microscopic Anatomy and Embryology I.). Semifinal examinations consist of solely a written part (e-learning module).

**Requirements of the examination<sup>6</sup>:**

During the semifinal examination the knowledge of students will be tested. Semifinal examinations are composed of a sole written test conducted with the use of digitized histological tissue slides and relevant theory questions.

**Topic list for the semifinal examination:****Microscopic Anatomy and Embryology I.*****General Histology, Histology of Organs***

Definition and classification of epithelial tissues

Simple epithelia

Stratified epithelia

Membrane specializations of epithelia

Glandular epithelia

Cells of connective tissue

Ground substance and fibres of connective tissue

Types of connective tissue

Histology of cartilage

Histology of the bone tissue

Intramembranous ossification

Endochondral ossification

Growth and remodeling of bone

Smooth muscle and myoepithelial cells

Skeletal muscle tissue

Cardiac muscle tissue

Histological structure of arteries and arterioles

Composition of capillaries and veins

General composition of parenchymal (solid/compact) organs

Wall structure of hollow organs

Fine structure of the intestinal villi, enteroendocrine system

***Lip and tongue***

Histological structure of the esophagus

Histological structure of the stomach

Histological structure of the small intestine (duodenum, jejunum, ileum)

Histological structure of the large intestine

Histological structure of the liver

Histological structure of the gall bladder, extrahepatic bile ducts and pancreas

Histological structure of the larynx, trachea and lung

Histology of kidney

Histological structure of the ureter and urinary bladder

Histological structure of the male genital apparatus (testicles, epididymis, spermatic cord, seminal vesicle, prostate and penis)

Histological structure of the female genital apparatus (ovary, uterine tube, vagina and the mammary gland)

Uterus (proliferative, secretory phases) menstrual cycle

Placenta and umbilical cord

**Maxillofacial histology**

Structure of enamel

Amelogenesis

Structure of dentin

Dentinogenesis

<p>Fine structure of the dental pulp  Structure and formation of cementum  Parodontal tissues  Parts and structure of gingiva  Tooth eruption  Histology of the palate  <b><i>Histology of the tongue</i></b>  Fine structure of salivary glands</p>
<p><b>Type and method of grading<sup>7</sup>:</b>  Semifinal examinations consist of solely a written part (e-learning module). Marking of the test is done automatically in the moodle system.</p>
<p><b>Registration for examinations:</b>  Via the NEPTUN system</p>
<p><b>Opportunities to retake the exam:</b>  According the Study and Examination Policy</p>
<p><b>Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material):</b></p> <p><b>List of textbooks</b>  The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384  Histology: A Text and Atlas: With Correlated Cell and Molecular Biology; 7th Edition by MH Ross and W Pawlina ; Wolters Kluwer 2015, ISBN 9781451187427  Wheater's Functional Histology, A Text and Colour Atlas, 6th Edition by B Young, G O'Dowd and P Woodford Churchill Livingstone, Edinburgh, 2013, ISBN 9780702047473  Oral Anatomy, Histology and Embryology, 4<sup>th</sup> Edition, by B. Berkovitz Paperback with STUDENT CONSULT Online Access and e-book ISBN: 9780723434115 Copyright: 2009  Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.</p> <p><i>Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014</i>  <i>Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033</i>  <i>Wheater's Functional Histology, A Text and Colour Atlas, 6<sup>th</sup> Edition by B Young, G O'Dowd and P Woodford ISBN 9780702047473, Churchill Livingstone, Edinburgh, 2013.</i>  <i>Illustrated Dental Embryology, Histology, and Anatomy, 3<sup>rd</sup> Edition by Mary Bath-Balogh ISBN: 9781437717303, 2011.</i></p> <p><i>Further study aids:</i></p> <p>To be downloaded from the homepage of the Department of Anatomy, Histology and Embryology (<a href="http://semmelweis.hu/anatomia">http://semmelweis.hu/anatomia</a> ) or from Knowledgebase on the Library homepage: (<a href="https://lib.semmelweis.hu/knowledge_base">https://lib.semmelweis.hu/knowledge_base</a>).</p>
<p><b>Signature of Subject Director/Coordinator:</b></p>
<p><b>Signature(s) of the head(s) of the Institute(s):</b></p>
<p><b>Date:</b> 2021. 06. 26.</p>

<p><b>Credit Transfer Committee's opinion:</b></p>
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<b>Comment of the Dean's Office:</b>
<b>Signature of the Dean:</b>

<sup>1</sup> Csak abban az esetben kell megadni, ha a tárgy az adott nyelven is meghírdetésre kerül.

<sup>2</sup> Dékáni Hivatal tölti ki, jóváhagyást követően.

<sup>3</sup> Az elméleti és gyakorlati oktatást órákra (hetekre) lebontva, sorszámozva külön-külön kell megadni, az előadók és a gyakorlati oktatók nevének feltüntetésével. Mellékletben nem csatolható!

<sup>4</sup> Pl. terepgyakorlat, kórlapelemzés, felmérés készítése, stb.

<sup>5</sup> Pl. házi feladat, beszámoló, zárthelyi stb. témaköre és időpontja, pótlásuk és javításuk lehetősége.

<sup>6</sup> Elméleti vizsga esetén kérjük a tételsor megadását, gyakorlati vizsga esetén a vizsgáztatás témakörét és módját .

<sup>7</sup> Az elméleti és gyakorlati vizsga beszámításának módja. Az évközi számonkérések eredményeink beszámítási módja.