

Semmelweis University
Department of Anatomy, Histology and Embryology
2024/2025

Faculty of Medicine
1st year, 2nd semester

HANDBOOK
Macroscopic Anatomy and Embryology II
Microscopic Anatomy and Embryology I



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Macroscopic Anatomy and Embryology I-II.

Microscopic Anatomy and Embryology I-II.

TEACHING DEPARTMENT:

SEMMELEI UNIVERSITY

Department of Anatomy, Histology and Embryology

Budapest, Tűzoltó utca 58.

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<http://semmelweis.hu/anatomia/en/>

LEARNING OBJECTIVES

Aims of the lectures in Macroscopic Anatomy - Presentation of important and/or complicated topics such as the structure of the body wall (e.g. thorax, pelvis), extremities and the cranium; the morphology of internal organs including the cardiovascular, digestive and urogenital systems; and the composition of the central nervous system, together with the organs of special senses and topography of body regions.

Aims of the lectures in Microscopic Anatomy/Histology - Presentation of the cell, basic principles in cellular morphology, detailed description of the epithelial, connective, muscle and nervous tissues. During the 2 semesters, the lectures contribute to the gross anatomical description of organs with a detailed presentation of their fine structures, including ultrastructural details. Important chapters: basic tissues, viscera, central nervous system.

Aims of the lectures in Embryology - Presentation of the early development from the differentiation of the germ cells to the formation of the human embryo (basic embryology). The embryology topics complement the gross anatomy and present histology lectures of the organs and systems also mentioning the most frequent malformations.

For the deeper understanding of relatively difficult questions small group discussions may be organized during the practical dissection room classes.

Aims of the practical dissection classes - In the first two semesters, based on their weekly programs, the students will study the morphology of the human body using anatomical specimens (bones, joints, muscles, viscera, brain) as well as learning the basic principles of dissection, including the proper usage of tools (scalpel, forceps, scissors) under the supervision of their lab instructors. Human development is taught together with Macroscopy.

Aims of the histology practical classes - From the second semester of the first year, supervised by their lab instructor, Students will learn the use of the a digital light microscope. The individual viewing of histology slides will facilitate the understanding of the basic tissues (epithelial, connective, muscle and nervous) and the fine structure of the organs.

The knowledge of students will be tested by regular **mid-term examinations**.

Lectures: First semester: 2x 45 min (Macroscopic Anatomy and Embryology I); second semester: 4x45 min Macroscopic Anatomy and Embryology II and 1x 45 min Microscopic Anatomy and Embryology I; third semester: 3x 45 min (Microscopic Anatomy II)

Practical classes: First semester: 6x 45 min (Macroscopic Anatomy and Embryology I) ; second semester: 6x 45 min Macroscopic Anatomy II and 4x45 min Microscopic Anatomy and Embryology I; third semester: 2x 45 min Microscopic Anatomy II.

Topics:

First semester: Gross anatomy of the bones, joints and muscles; composition, vessels and nerves of limbs and the body wall, skull, organs, cavities, nervous and vascular supply of the head and neck regions. General Embryology. Development of the skull, spine and limbs.

Second semester: Morphology and Embryology of the heart and vessels, thoracic/abdominal/pelvic viscera, body cavities and serous membranes. Sectional anatomy of the thorax, abdomen and pelvis. Description of the diaphragms. Macroscopy of central and peripheral nervous systems, organs of special senses.

General histology (basic tissues). Histology of the heart and vessels, the lymphatic system, gastrointestinal and urogenital organs.

Third semester: Histology and embryology of the central and peripheral nervous system together with the organs of special senses and endocrine organs. Microscopy of the CNS

EM I Macroscopic Anatomy and Embryology II. Announcements

ACCEPTENCE OF THE SEMESTER:

1. Active participation in dissection room sessions is obligatory for every student. **Students should attend at least 75% of the scheduled hours, including the midterm tests, to gain a signature** proving the validity of the semester. Absences are therefore limited in **25%**. Attendance will be recorded in the dissection room classes.
2. At least **one of the two midterms will have to be passed with at least a mark 2**, or the semester is not accepted. Retake midterms are offered during the last two weeks of the semester in a pin test format composed of the topics of the entire semester (i.e. both midterms topics).

Attendance at practical classes is obligatory

Students should present themselves well prepared and on time to start with the dissection work. Attendance is regularly checked and students will have to sign a presence sheet once the teacher has verified their presence.

Students unfit to start the practical class at the **starting time specified in the time table** will be recorded as „being late“. According to the *Study policy 28. § 12. point - 3* (three) such occasions of „being late,, will add up to a **recorded absence**.

Furthermore, students arriving later than 5 minutes past the starting time may participate in the class but their presence will not be recorded/accepted (i.e. counts as an absence).

MIDTERM EXAMINATIONS

During the semester, both practical and theoretical knowledge will regularly be evaluated. Attendance and the passing of at least one of the midterm is obligatory to gain acceptance of the semester. Students failing both midterm tests should reattend at the given two retake dates to pass a pin test. Students unsuccessful at either/both of retake midterms will not gain a signature so they will not be able to sit for the final examination and will have to repeat the semester in the following academic year.

The midterms are held in the dissection room, and composed of identification of several structures on the specimen together with theoretical questions related to the subject.

Test I. (oral, obligatory to attend) **Date: 7th week** (3rd class of the week)

Topics: *Internal organs of the head, neck, thorax, abdomen and pelvis, together with their development*

1st and 2nd retake dates: Week 13/14 TBA (Monday or Tuesday)

Test II. (oral, obligatory to attend) **Date: 13th week** (3rd class of the week)

Topics: *Organs of the retroperitoneal and pelvic organs together with their development. Macroscopy of the central nervous system, intracranial topography (without the topography of the orbit)*

1st and 2nd retake dates: Week 14 TBA

BONUS MARK - Students may earn a **bonus dissection mark** (4 or 5 only) from the average of the two oral tests. A mark 4 (good) can be earned if the midterm average is 4,00 (4+4 or 3+5); while a mark 5 (excellent) will be earned if the average of the midterm marks is at least 4,50 (4+5 or 5+5). This **bonus mark** will be added to the marks of the practical part of the final examination in case it increases the final mark.

Please note that only **marks from the first, official, attempt are counted in**, marks earned at the retake midterm/s are not considered. Furthermore, the result of the first attempt cannot be improved/ upgraded by taking the retake midterm.

DISSECTION WORK – during the two semesters, Students are given selected dissection tasks to improve their dexterity as well as to deepen their knowledge concerning topographical relations. Students should submit their task before the end of the 1st or the 2nd semester to be able to sit for the final examination.

EXAM COMPETITION (written)

All students with **an average of 4,0 from the two midterms are invited to participate** in a written (moodle) competition from the topics of the 2 semesters of the subject held on Week 13. Students achieving good marks (4 or 5) at the test may be **exempted**** from the written part of the final examination and thus will have to sit only for the oral/dissection part.

2nd round (pin test)

The **first 10 students** achieving the best results in the written test are invited to participate in the 2nd round (a pin test) where certain anatomical structures (labelled by numbers) will have to be identified on true specimens / prosections. The competition is held during week 14.

The winners of the 1st, 2nd and 3rd prizes will be decorated with a diploma of merit.

FINAL EXAMINATION

Topics: Subject matter of the two semesters (Macroscopic Anatomy I-II.)

The final examination consists of practical and theoretical parts:

1. Written pretest (Macroscopic Anatomy questions, via the moodle system) unless exempted
2. Oral examination (Identification of structures on anatomical prosections, including relevant theoretical/ Embryology questions)

Marking system

The final result/mark of the examination is calculated from the following partial marks:

1. Written test (unless exempted**)
2. Musculoskeletal system
3. Internal organs
4. Macroscopy of the central nervous system
- +
5. *Bonus dissection mark* (for those having an average of 4,00-5,00 from the midterm marks)

PLEASE NOTE

1. *Only those students are eligible to sit for the final examination who have successfully finished their dissection task.*
2. *Students enrolled in a CV course in Macroscopic Anatomy I. may only sit for the final examination in Macroscopic Anatomy II. following a successful examination in Macroscopic Anatomy I.*

*Students may request an oral examination to replace the written theoretical part for the 2nd or 3rd retakes of the semifinal examination. The request will have to be submitted in writing with the Course Director **48 hours prior to the date of the examination. This request has to be resubmitted in case students would like to ask for a further occasion.***

Academic Year 2024/2025 Faculty of Medicine Macroscopic Anatomy and Embryology II.

Week	Lectures EM 1-11 Mon 12.00-13.45 and Tue 10.00-11.45 Lenhossék EM 12-22 Tue 8.00-9.45 Lenhossék and Wed 13.15-15.00 Huzella	EM 1-11 Lecturers	EM 12-22 Lecturers	Dissection room classes
Week 1 02.10-14.	1. Nasal cavity, paranasal sinuses 2. Morphology and development of teeth / Oral cavity, tongue, palate, salivary glands, faucial isthmus 3. Oral cavity, tongue, palate, salivary glands, faucial isthmus /Morphology and development of teeth 4. Clinical anatomy of the facial cranium	1 Székely 2 Shahozi 3 Kozsarek 4 clinician	1 Székely 2 Kozsarek 3 Shahozi 4 clinician	Dissection /inspection of the walls and cavities of the head and neck region Dissection /inspection of the cervical internal organs
Week 2 02.17-21.	5. Pharynx, esophagus 6. Larynx 7. Development of the face, malformations 8. Clinical anatomy of the cervical viscera and lymph nodes	5 Vereczki 6 Alpér 7 Nagy 8 clinician	5 Vereczki 6 Alpér 7 Nagy 8 clinician	
Week 3 02.24-28.	9. Development of the pharyngeal arches, development of the foregut 10. Thoracic cavity, mediastinum. Chambers of the heart, external features. Structure of heart wall, valves, fibrous skeleton. Pericardium. 11. Cardiac vessels and nerves, conducting system. Surface projection. Auscultation points. 12. Clinical anatomy of the thorax 1.	9 Nagy 10 Kocsis 11 Kocsis 12 clinician	9 Nagy 10 Kocsis 11 Kocsis 12 clinician	Opening of the thorax, dissection of the thoracic cavity Opening of the abdominal cavity, dissection /inspection of the abdominal organs Opening of the abdominal cavity,
Week 4 03.03-07.	13. Development of the heart 14. Development of arteries and veins 15. Morphology of trachea and the lung. Pleura 16. Clinical anatomy of the thorax 2.	13 Nagy 14 Nagy 15 Récz 16 clinician	13 Nagy 14 Nagy 15 Récz 16 clinician	
Week 5 03.10-14.	17. Development of the respiratory system. 18. Stomach and small intestines (duodenum, jejunum, ileum) 19. Liver, gall bladder, pancreas, spleen. 20. Clinical anatomy of the abdominal cavity 1.	17 Minkó 18 Ádám 19 Récz 20 clinician	17 Minkó 18 Ádám 19 Récz 20 clinician	
Week 6 03.17-21.	21. Large intestine, rectum 22. Development of the midgut and hindgut 23. Peritoneal relations of abdominal organs. Development of the peritoneum, separation of body cavities 24. Clinical anatomy of the abdominal cavity 2. Retroperitoneum	21 Székely 22 Nagy 23 Dóra 24 clinician	21 Székely 22 Nagy 23 Dóra 24 clinician	
Week 7 03.24-28.	25. Morphology of the kidney, capsules of the kidney, ureter, urinary bladder. 26. Morphology and coats of the testicle 27. Morphology of the epididymis, spermatic cord, seminal vesicle and prostate 28. Morphology of penis and male urethra. Male perineum	25 Lendvai 26 Katz 27 Barna 28 Barna	25 Lendvai 26 Katz 27 Barna 28 Barna	
Week 8 03.31 - 04.04.	29. Ovary, Fallopian tube and uterus 30. Vagina, female perineum, external genital organs 31. Clinical anatomy of the male urogenital tract 32. Clinical anatomy of the female urogenital tract	29 Katz 30 Cséki 31 clinician 32 clinician	29 Katz 30 Cséki 31 clinician 32 clinician	Dissection/ inspection of the retroperitoneal organs and perineum together with organs of the lesser pelvis
Week 9 04.07-11.	33. Development of the urinary system 34. Development of genital organs 35. Topographical divisions of the central nervous system, developmental units 36. Meninges, epidural and subarachnoidal spaces, ventricles, choroidal plexus, CSF	33 Puskár 34 Zsiros 35 Ádám 36 Kozsarek	33 Nagy 34 Zsiros 35 Ádám 36 Kozsarek	
Week 10 04.14-18. Friday is holiday	37. Lobes of the cerebral cortex, topographical subdivisions, structure and function of the medial, lateral and basal cortical fields 38. Topography and components of the basal ganglia and the diencephalon (thalamus, hypothalamus), the 3rd ventricle. 39. Topography and components of the brainstem (midbrain, pons, medulla oblongata), the 4th ventricle. 40. Arterious, venous and lymphatic circulation of the brain	37 Horváth 38 Horváth 39 Katz 40 Alpér	37 Horváth 38 Horváth 39 Katz 40 Alpér	Dissection/ inspection of the brain and spinal cord.
Week 11 04.21-25. Easter Monday is holiday	41. Cranial nerve nuclei 42. Oculomotor nerve (CN 3), ophthalmic and maxillary branches of the trigeminal nerve (CN 5/1, CN 5/2), 43. Mandibular branch of the trigeminal nerve (CN 5/3), facial nerve (CN 7) 44. Clinical anatomy of the oculomotor, trigeminal and facial nerves	41 - 42 - 43 Récz 44 Harics	41 Récz 42 Harics 43 Harics 44 clinician	Dissection/ inspection of the brain and spinal cord. Intracranial spaces.
Week 12 04.28 - 05.02. Thursday is holiday	45. Glossopharyngeal nerve (CN 9), hypoglossal nerve (CN 12) 46. Accessory nerve (CN 11), vagus nerve (CN 10) 47. Clinical anatomy of the glossopharyngeal, vagus, accessory and hypoglossal nerves 48. General composition of cranial nerves). Consultational lecture (Q&A)	45 Dóra 46 Zsiros 47 clinician 48 Ádám	45 Dóra 46 Zsiros 47 clinician 48 Ádám	
Week 13 05.05-09.	49. Spinal cord, spinal ganglia, spinal segment. Spinal nerves, nerve plexuses 50. Intracranial topography, orbit 51. The autonomic nervous system. Sympathetic nervous systems 52. The autonomic nervous system. Parasympathetic nervous systems COMPETITION (1st round - TBA)	49 Horváth 50 Adorján 51 Puskár 52 Tóth	49 Horváth 50 Adorján 51 Puskár 52 Tóth	Midterm 2. Retroperitoneum. Morphology and development of the pelvic organs. Macroscopy of CNS. Intracranial topography Cranial nerve branches
Week 14 05.12-16.	53. Lymphatic system. Regional lymphatic drainage of organ, lymph nodes. 54. Topographical relations of the thoracic cavity 55. Topographical relations of the abdominal cavity 56. Topographical relations of the pelvis COMPETITION (2nd round - TBA)	53 Székely 54 Adorján 55 Lendvai 56 Zsiros	53 Székely 54 Adorján 55 Lendvai 56 Zsiros	Cross sectional anatomy Revision

Topics of the final examination in Macroscopic Anatomy and Embryology II

Macroscopic Anatomy and Embryology I

see in the previous Handbook

Internal organs of the head & neck region (morphology and development)

Oral cavity (divisions, boundaries)

Floor of mouth, sulcus lateralis linguae

Macroscopy of the tongue

Types and morphology of teeth, blood supply and innervation

Tooth development

Salivary glands together with topography

Faucial isthmus, palate. Tonsils

Pharynx and parapharyngeal spaces

Blood supply and innervation of pharynx

Pharyngeal muscles

Nose, nasal cavity (boundaries, nasal meatus, vessels)

Paranasal sinuses (connections, vessels)

Larynx (shape, position, muscles, vessels, nerves)

Skeleton and joints of larynx together with the fibroelastic membranes, mucous membrane

Common and external carotid arteries and their branches. Maxillary artery and its branches

Venous drainage of face and neck

Lymph nodes and lymphatic vessels of the head&neck

Development of the face, including the developemnt of the oral and nasal cavities

Development and differentiation of the foregut

Derivatives of the branchial arches

Derivatives of the branchial pouches and grooves

Development of the teeth and tongue

Circulatory system (morphology and development)

Shape, external features of heart

Chambers of heart

Endocardium, ostia, valves of heart

Skeleton of heart, anuli fibrosi

Structure of heart wall

Pulse generating and conducting system of heart

Pericardium

Position and surface projections of heart

Percussion and auscultation (area of cardiac dullness, heart sounds)

Radiology of heart

Early circulation (formation of vessels, basis vascular systems of the embryo/fetus)

Heart development

Pulmonary circulation

Ascending aorta, arch of aorta and its branches

Subclavian artery and its branches

Thoracic aorta and its branches

Abdominal aorta and its branches

Development of arteries (aorta, branchial arterious arches, umbilical arteries)

Celiac trunk and its branches

Superior mesenteric artery and its branches

Inferior mesenteric artery and its branches

External and internal iliac arteries and their branches

Internal pudendal artery and its branches

Superior vena cava and its tributaries

Inferior vena cava and its tributaries

Azygos and hemiazygos veins and their tributaries
Portal vein and its tributaries, portocaval anastomoses
Development of veins (inferior v. cava, portal v., superior v. cava, azygos and hemiazygos veins)
Fetal circulations
Lymphatic drainage of the abdominal and pelvic organs
Thoracic duct, right lymphatic trunk

Morphology and development of the thoracic, abdominal and pelvic organs

Trachea and bronchial tree
Lung (shape, parts, surfaces, hilum)
Lung (position, topography, vessels, nerves)
Surface projection of pleura and lung
Pleura, pleural cavity
Mediastinum (divisions and content)
Development of the lower airways including the lung
Description and topography of the esophagus
Stomach (shape, position, parts, blood supply and innervation). Peritoneal relations
Duodenum (shape, position, divisions, vessels)
Jejunum-ileum (shape, position, vessels)
Large intestine (shape, position, vessels)
Rectum, anal canal (shape, position, vessels)
Liver (shape, position, peritoneal relations, vessels)
Gall bladder and biliary passages (anatomy)
Pancreas (shape, position, vessels)
Peritoneum, greater and lesser omentum, mesentery, omental bursa
Formation and differentiation of the midgut
Formation and differentiation of the hindgut
Development of liver and pancreas
Development of the peritoneum
Formation of body cavities, development of the diaphragm

Kidney (shape, position, hilum, sinus, capsules, vascular architecture)
Renal pelvis and calyces. Ureter
Urinary bladder (shape, position, muscles, vessels)
Female urethra
Male urethra, bulbourethral gland
Development of kidneys
Development of urinary passages
Testis (shape, position, vessels). Scrotum, coats of testis
Epididymis, vas (ductus) deferens, spermatic cord
Seminal vesicle, prostate
Penis (shape, position, mechanism of erection, vessels, nerves)
Pelvic floor, male perineum (connective tissue spaces)
Hernia canals (inguinal and femoral)
Ovary (shape, position, vessels)
Uterine tube (shape, position, vessels)
Uterus (shape, parts, position, supporting structures, vessels) Broad ligament
Vagina, female perineum (connective tissue spaces)
External female genital organs (mons pubis, labia, vestibule of vagina, greater vestibular gland, vessels)
Development of gonads, formation and migration of primordial germ cells
Development of male genital system
Development of female genital system
Development of the external genital organs

Macroscopy of the nervous system

Intracranial topography Dura mater, dural sinuses

Arachnoid mater, pia mater, cisterns, CSF circulation

Description and meninges of the spinal cord

Brain stem (medulla oblongata, pons, midbrain)

Cerebellum

Diencephalon (parts, blood supply). Thalamus, hypothalamus

Lateral ventricles, III. ventricle, IV. ventricle

Hemispheres

Internal carotid artery (course, parts and branches)

Vertebral artery (course and branches)

Circle of Willis

Veins of the brain

Cranial nerve nuclei, macroscopy of cranial nerves together with the brain, dural and skull exits

Branches of cranial nerves (CN 3, CN 4, CN 5, CN 6, CN 7, CN 9, CN 10, CN 11, CN 12)

General composition of the autonomic nervous system

Sympathetic nervous system (cranial, cervical, thoracic and lumbar parts)

Sympathetic trunk

Parasympathetic system (cranial and sacral parts)

Topography of the orbit. Extraocular muscles. Eye movements.

Eyelids, conjunctiva, fasciae of the orbit, lacrimal apparatus

EM I Microscopic Anatomy and Embryology I. Announcements

SUBJECT MATTER OF THE SEMESTER

I. Microscopy of basic tissues

Simple, stratified and glandular epithelia, connective & supporting tissues, muscle tissues, blood, bone marrow

II. Microscopical structure of internal organs

Cardiovascular, gastrointestinal, respiratory and urogenital systems and elements of the peripheral nervous system apparent in the organs

ACCEPTENCE OF THE SEMESTER:

1. Active participation in the Histology laboratory sessions is obligatory for every student. **Students should attend at least 75% of the scheduled hours, including the midterm tests, to gain a signature** proving the validity of the semester. Absences are therefore limited in **25%**. Attendance will be recorded in the classes.

2. At least **one of the two midterms will have to be passed with at least a mark 2**, or the semester is not accepted. Retake midterms are offered during the last two weeks of the semester - TBA .

Attendance at practical classes is obligatory

Students should present themselves well prepared and on time to start with the dissection work. Attendance is regularly checked and students will have to sign a presence sheet once the teacher has verified their presence.

Students unfit to start the practical class at the **starting time specified in the time table** will be recorded as „being late“. According to the *Study policy 28. § 12. point - 3* (three) such occasions of „being late,, will add up to a **recorded absence**.

Furthermore, students arriving later than 5 minutes past the starting time may participate in the class but their presence will not be recorded/accepted (i.e. counts as an absence).

MIDTERM TESTS

There are two written tests held in the Digital Histology Laboratories. Attendance is obligatory, in case of absence students will be offered two retake possibilities.

Midterm test 1 - Date: **Week 5** (2nd class of the week)

Basic tissues (slides viewed during weeks 1-4)

Retakes will be offered during weeks 13/14 - TBA

Midterm test 2- Date: **Week 11** (2nd class of the week)

Histology of organs (except for the genital tract);

Retakes will be offered during weeks 13/14 - TBA

EXEMPTIONS - Students may earn an **exemption** *from the written part of the semifinal examination with a 4 or a 5 calculated from the average of the two written tests. A mark 4 (good) can be earned if the midterm average is 4,00; while a mark 5 (excellent) will be earned if the average of the midterm marks is at least 4,50.

SEMIFINAL EXAMINATION

Topics: Subject matter of the semester (Microscopic Anatomy and Embryology I.)

The semifinal examination consists of practical and theoretical parts:

1. Written pretest - unless exempted* (Microscopic Anatomy and Embryology questions)
2. Oral examination (Identification of structures on a digital slide including relevant theoretical question)

Week	Lectures (Lenhossék lecture room)	Lecturers 1-11 Wed 10.00-10.45	Lecturers 12-22 Thurs 12.00-12.45	Histology Laboratories (2x90 minutes)
Week 1 02.10 -14.	1 Epithelial tissues, cell contacts, intercellular connections Glandular epithelium	1 Kocsis	1 Kocsis	Epithelial tissues 1, 2, 3
				Epithelial tissues II. 4a, 5, 6, 7a
Week 2 02.17 -21.	2 Connective tissue cells and fibres. Extracellular matrix	2 Puskár	2 Puskár	Glandular epithelium 3, 10a, 11, 12, 10c
				Connective tissue cells/fibres 20a, 6, 21, 24, 25b, 3, 22, 23a
Week 3 02.24 - 28.	3 Supporting tissues (cartilage, bone)	3 Puskár	3 Puskár	CT types: 20a, 6, 26, 10b, 27; Blood 28
				Supporting tissues 30, 32, 33, 34, 35, 36, 37, 31, Types of bone formation 38a, 39
Week 4 03.03 -07.	4 Ossification, bone remodelling Erythropoiesis, leukopoiesis	4 Dóra	4 Dóra	Nerve tissue 40, 41
				Types of muscle tissues 50, 5, 51, 52
Week 5 03.10 -14.	5 Muscle tissues	5 Barna	5 Barna	MIDTERM 1 - Basic tissues Histology of vessels 25a, 60, 61, 1, 25b, 62, 63, 64
				Lymphatic organs (thymus, tonsils) 100a, 101, 103, 104, 100b, 102a-b
Week 6 03.17 -21.	6 Histology of the tongue and teeth Histology of the esophagus	6 Kozsurek	6 Hanics	Lymphatic organs (lymph node, spleen) 21, 105, 106a-b
				Lip, tongue, lingual papillae 110, 61, 111, 112
Week 7 03.24-28.	7. Cellular components of lymphatic tissue. Thymus, tonsils, MALT, lymph nodes and spleen	7 Nagy	7 Nagy	Teeth, tooth bud 120a-b, 121
				Salivary glands 10c, 122, 123, 10a
Week 8 03.31 -04.04	8. Histology of the stomach. Microscopical anatomy of the small and large intestines	8 Zsiros	8 Zsiros	Esophagus, stomach, 5, 130a, 131, 134
				Intestines 132a, 135a, 136a, 137, 138a, 132b, 132c, 133, 136b, 138b
Week 9 04.07 -11.	9. Histology of the liver, gall bladder and pancreas	9 Dobolyi	9 Dobolyi	Liver, gall bladder, pancreas 140a-b, 141, 24, 2, 142a, 140c
				Epiglottis, larynx 150, 151,
Week 10 04.14 -18. Friday is holiday	10. Histology of the airways	10 Katz	10 Katz	Trachea, lung 3, 152, 153, 154
				Kidney, ureter, urinary bladder 160, 161, 162, 4a-b
Week 11 04.21 -25. Easter Monday is holiday	11. Microscopical anatomy of urinary organs	11 Ádám	11 Ádám	MIDTERM 2 - histology of internal organs (except for the genital organs) Histology of the male genital system I. 170a-b, 171
				Histology of the male genital system II. 172, 173, 174a, 174b, 7a, 7b, 7c
Week 12 04.28 - 05.02. Thursday is holiday	12. Histology of the male genital system	12 Hanics	12 -	May 1 is a holiday
				Histology of the female genital system I. 180, 181a-b, 182
Week 13 05.05 -09.	13. Histology of the female genital system I.	13 Tóth	13 Tóth	Histology of the female genital system II. 27, 183, 23a, 23b, 187a-b-c
				Placenta, Mammary gland 184, 185, 20a, 186a, 186b-c
Week 14 05.12 -16.	14. Histology of the female genital system II. Placenta, mammary gland	14 Minkó	14 Minkó	Revision

HISTOLOGY LABORATORY SESSIONS WILL BE HELD IN THE CITY CORNER OFFICES (ÜLLŐI ÚT 25.)

<p>Week 6 03.17 -03.21.</p>	<p>Lymphatic organs 100a Thymus (HE) 100b Thymus (pancytokeratin ICC), 101. Palatine tonsil (HE) 103. Pharyngeal tonsil (HE) 102. Lingual tonsil (HE) 102 a,b Palatine tonsil (T/B cell ICC)</p> <hr/> <p>Lymphatic organs 21. Lymph node (rat, TB) 105. Spleen (human, HE) 106 a,b Spleen (human T/B cell ICC)</p>
<p>Week 7 03.24 - 03.28</p>	<p>Gastrointestinal tract 110. Lip (Krutstay trichrome) 61. Tongue: <i>filiform and fungiform papillae</i> (HE) 111. Tongue; foliate papillae (human + monkey or rabbit, HE) 112. Tongue: <i>circumvallate papillae</i> (HE)</p> <hr/> <p>120. a, b Ground tooth (unstained) 10c. Submandibular gland (Movat pentachrom) 121. Developing tooth (AZAN) 51. Parotid gland (HE) 122. Sublingual g+ submandibular glands (HE) 10a. Submandibular gland (human, HE)</p>
<p>Week 8 04.01 - 04.</p>	<p>5. Esophagus: upper and middle portions (human, HE) 130a. Stomach, fundus (HE) 132. a Duodenum (HE) 132. b Duodenum (human PAS +H) 131. Gastro-esophageal junction - cardia (HE) 132c Duodenum (human, alcian blue H picrosirius red) 134. Pylorus (gastroduodenal junction, HE) 133 Duodenum (cat, HE)</p> <hr/> <p>135a Jejunum (HE) 136a ileum (human, HE) 136a ileum (Peyer's patches, human, HE) 138a. Vermiform appendix (human, HE) 137. Colon (human, HE) 138. b Vermiform appendix (aged, human, HE)</p>
<p>Week 9 04.07 - 04.11</p>	<p>140. a,b Liver (human, HE) 24. Liver (human, silver impregnation) 141 Liver (human, trichrome) 140. c Liver (human, SMA ICC/H) 2. Biliary vesicle: fundus & neck (human, HE) 70. Pancreas (HE)</p>
<p>Week 10 04.14- 04.18</p> <p>Friday is holiday</p>	<p>Respiratory system * EM 12-17 Epiglottis, larynx, AND Trachea and lung 150. Epiglottis (HE) 151. Larynx (HE)</p> <hr/> <p>3. Trachea (HE) 153. Lung (toluidine blue) * EM 12-17 Kidney, ureter, urinary bladder 152. Lung (HE) 154. Fetal lung (human, HE)</p>
<p>Week 11 04.21 -04.25.</p> <p>Monday is holiday</p>	<p>Urinary system * EM 12-17 No histology class on Easter Monday 160. Kidney (HE) 161. Kidney (semithin, toluidine blue) 162. Ureter (HE) 4. a,b Urinary vesicle (monkey, HE)</p> <hr/> <p>MIDTERM 2. Histology of internal organs (except for the genital organs) Male genital system 170. a, b Testicle (human, HE) 172. Spermatic cord (human, trichrome) 171. c Epididymis (human, HE)</p>
<p>Week 12 04.28 - 05.02.</p> <p>Thursday is May 1</p>	<p>173. Prostate (aged, human, HE) 174. a,b Seminal vesicle (HE) 7. a Penis (human, HE) 7. b Penis (human, Verhoeff's elastic stain) 7. c Glans penis (HE)</p> <hr/> <p>No Histology classes on Thursday</p>
<p>Week 13 05.05 - 09.</p>	<p>Female genital tract 180. Ovary (rabbit, HE) 182. Fallopian tube, isthmus and ampulla (human, HE) 181. a, b Corpus luteum (human, HE)</p> <hr/> <p>27. Uterus, proliferation's phase (human, HE) 183. Uterus, secretory phase (human, HE) 23a. Vagina (human, trichrome) 23b. Vagina (human, HE)</p>
<p>Week 14 05.12 - 16.</p>	<p>20a. Umbilical cord of a newborn (human, HE) 184. Mamma non-lactans (HE) 186a. Placenta (mature (delivered), human, HE) 185. Mamma Lactans (HE) 186b. Placenta (mature, human, pan-cytokeratin ICC) 186c. Placenta (6th week of pregnancy, human, HE) 187a Clitoris (glans, human, HE) 187b Clitoris (body, HE) 188. Clitoris (glans, Neurofibril staining)</p> <hr/> <p>REVISION</p>

Topics of the semifinal examination in Microscopic Anatomy I

General Histology

Concept of basic tissues
Definition and classification of epithelial tissue
Simple epithelia
Stratified epithelia
Membrane specializations of epithelia
Glandular epithelia
Pigment epithelium, sensory neuroepithelium
Cells of connective tissue
Ground substance and fibres of connective tissue
Types of connective tissue
Blood and the corpuscular elements of blood
Histology of the bone marrow, maturation of erythrocytes and platelets
Differentiation of granulocytes, lymphocytes and monocytes
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
Nervous tissue

Histology of organs

Histology of lymph organs (lymph node, MALT/ tonsilles, spleen, thymus)
Histological structure of arteries and arterioles
Composition of capillaries and veins
Wall structure of hollow organs
Histology of the lip, tongue and teeth
Structure of the esophagus
Histology of the airways (epiglottis, larynx, trachea, lung)
Histology of the stomach
Structure of the small and large intestines
Histology of the liver and biliary passages including the gall bladder
Histology of the pancreas
Histology of the kidney and the urinary passages (ureter, urinary bladder)
Histology of the testicles together with the epididymis
Histology of the prostate, seminal vesicle, spermatic cord
Histology of the penis
Histology of the ovary, uterine tube; corpus luteum
Histology of the uterus
Histology of the vagina
Histology of the mammary gland
Placenta, umbilical cord

RECOMMENDED LITERATURE

List of textbooks

- Sobotta Atlas of Human Anatomy, 15th English ed. Musculoskeletal system, internal organs, head, neck, neuroanatomy, By Waschke & Paulsen, ISBN-13: 9780702052507 2013
- Gray's Anatomy for students with STUDENT CONSULT Online Access, 3rd Edition by R. Drake, A. W. Vogl, A. Mitchel, Elsevier; 2014; ISBN 9780702051319
- THIEME Atlas of Anatomy, General Anatomy and Musculoskeletal System, 2014 by Schuenke, ISBN: 9781604069228
- THIEME Atlas of Anatomy, Head, Neck and Neuroanatomy, 2016 by Schuenke, ISBN: 9781626231207
- THIEME Atlas of Anatomy, Internal Organs, 2016 by Schuenke, ISBN: 9781626231665
- McMinn and Abrahams' Clinical Atlas of Human Anatomy with STUDENT CONSULT Online Access , 7th Edition By Abrahams, Spratt, Loukas & van Schoor ISBN-13: 9780723436973 , 2013
- Netter: Atlas of Human Anatomy, Including Student Consult Interactive Ancillaries and Guides, 6th Edition, 2014.
- Human Anatomy, Color Atlas and Textbook, 6th Edition by J Gosling, P Harris, J Humpherson, I Whitmore and P Willan; ISBN 9780723438274 Elsevier, 2016.
- Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.

- *Gray's Anatomy. The Anatomical Basis of Clinical Practice; 41st edition by S. Standring: 2015 ISBN : 9780702052309*
- *Netter's Clinical Anatomy with Online Access, 3rd Edition, by J. Hansen, 2014, eBook ISBN: 9781455770632 eBook ISBN: 9780323312899 014*
- *Anatomy, A Photographic Atlas, 8th Edition by Rohen, Yokochi; Wolters Kluwer, 2016, ISBN: 978-1-4963-0870-2*
- *Bräuer: Sobotta Flashcards (Muscles; Bones, Ligaments, and Joints) URBFI, 2013.*
- *RMH McMinn: Last's Anatomy, Regional and Applied. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4*

- Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014
- 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*
- Stevens & Lowe's Human Histology , Elsevier, 4th ed ISBN 978-0-723435020, 2015.
- Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.

- *The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384*
- *Histology Manual 1-3. by A. Nemeskéri and K. Kocsis: István Apáthy's Foundation, 2019.*
- *L. Kierszenbaum Histology and Cell Biology: An Introduction to Pathology, 4th Edition, Paperback with STUDENT CONSULT Online Access and E-Book ISBN: 9780323085885;, 2015*
- *Junqueira's Basic Histology: Text and Atlas; 13th Edition by Anthony Mescher, New York, McGraw-Hill Medical, 01/03/2013 ISBN13 978007178033*
- *Regional Anatomy, by T Tömböl, Medicina 2008, ISBN 963 242 186 8*
- *Sectional Anatomy – Workbook, by A. Nemeskéri; István Apáthy's Foundation, 2001.*
- *Neuroanatomy An Illustrated Colour Text, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 97807020308*

Further study aids:

To be downloaded from the homepage of the Department of Anatomy, Histology and Embryology (<http://semmelweis.hu/anatomia>) or from Knowledgebase on the Library homepage: (https://lib.semmelweis.hu/knowledge_base).