

Semmelweis University
Department of Anatomy, Histology and Embryology

Faculty of Medicine
1st year 2nd semester

ANATOMY HANDBOOK



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Anatomy, Histology and Embryology for EM students

TEACHING DEPARTMENT:

SEMMELWEIS UNIVERSITY

Department of Anatomy, Histology and Embryology

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LEARNING OBJECTIVES

Aims of the lectures in anatomy: Presentation of the important and/or complicated chapters such as introductory chapters, thorax, pelvis, hand, foot, skull, heart, chapters of the visceral organs, central nervous system, **organs of special senses, topographical anatomy.**

Aims of the lectures in cell biology and histology: Presentation of the cell, basic principles in cell biology (mitosis, cytoskeleton, cellular motility), detailed presentation of the basic tissues (epithelial, connective, muscle and nervous). Completing the gross anatomy with the detailed presentation of the fine structure of the organs, including the ultrastructural details as well as the molecular arrangement. 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 (general embryology). Presentation of the development of the organs and functional systems parallel with the gross anatomical and histological lectures including the frequently occurring malformations.

Aims of the practical sessions in the dissecting room: Based on the weekly programs the students study the preparations (bones, joints, muscles, viscera, brain) and dissect (parts of or an entire cadaver). They are aided by the lab instructors. Bones, joints, muscles and peripheral nervous system will be taught primarily in the dissecting room.

Aims of the practical sessions in the histology room: Facilitate the understanding of the basic tissues (epithelial, connective, muscle and nervous) and the fine structure of the organs through the observation and interpretation of histological specimens.

Discussion of the more complicated chapters of the embryology is presented on small group discussions connected to the practical sessions in the dissecting room.

The knowledge of the students will be checked by mid-term tests.

Lectures: first semester: 3x 45 min; second semester: 3x 45 min; third semester: 3x 45 min; fourth semester: 1x 45 min.

Topics of the lectures:

First semester: Gross anatomy of the bones, joints and muscles, basic cytology, basic histology, basic embryology, development of the skull, spine and limbs.

Second semester: Heart and vessels, lymphatic organs, viscera and body cavities; integrated gross anatomy, cytology, histology and embryology.

Third semester: Central and peripheral nervous system, organs of special senses, endocrine organs; integrated gross anatomy, cytology, histology and embryology.

Fourth semester: Topographical anatomy of the head, neck and body cavities (thorax, abdomen, pelvis), cross sectional anatomy.

Practical course

: 6x 45 min; second semester: 6x 45 min; third semester: 4x 45 min; fourth semester: 2x 45 min;

First semester: Gross anatomy of the bones, joints and muscles, basic cytology, basic histology, basic embryology, development of the skull, spine and limbs.

Second semester: Heart and vessels, lymphatic organs, viscera, topography of body cavities; integrated gross anatomy, cytology, histology and embryology. Topographical anatomy of the ventral regions of limbs and the trunk.

Third semester: Central and peripheral nervous system, organs of special senses, endocrine organs; integrated gross anatomy, cytology, histology and embryology. Topographical anatomy of the dorsal regions of limbs and the trunk, including spinal cord.

Fourth semester: Topographical anatomy of the head, neck and body cavities (thorax, abdomen, pelvis), cross sectional anatomy. Review of the subjects taught and studied during the four semesters.

Type of exams: first semester: semifinal; second semester: semifinal; third semester: semifinal; fourth semester: final exam from the subjects of the four semesters..

ECTS credits: four semesters together: 28 (first semester: 9; second semester: 9; third semester: 7; fourth semester: 3)

EM I ANNOUNCEMENTS

Evaluation is made using a five-grade scale (1-5).

Signing of the lecture book: active participation in lectures, dissection room and histology lab sessions is obligatory. Students should attend at least 75% of the scheduled hours to gain a signature proving the validity of the semester. Absences are therefore limited in **25%**.

Midterm examinations: During the four semesters, both practical and theoretical knowledge will regularly be evaluated. The anatomy and histology mid-terms may be oral or written exams. The **anatomy** mid-terms include both identification of several structures on the specimen and theoretical questions related to the subject. The **histology** midterms include the identification of a certain number of structures in slides, as well as, theoretical questions related to the subject. (N.B. there are no histology midterms in the 3rd and 4th semesters.)

Semester-end dissection (or PIN) test: During the last two weeks of the semester, every student will have to sit for an obligatory practical test to gain **acceptance of the semester**.

Students, whose midterm tests were **passed** with at least a 2 **and have participated in every midterm test**, will be exempted from the semester-end dissection test.

Students, with **failure and/or absence** from tests, will be obliged to sit for the pin test unless the **average of their midterm marks is at least 2.51**. Midterm failures can only be corrected taking this test and cannot be retaken during the semester or the examination period. The exact date of the tests will be announced in due course. The results of all tests will appear on the personal achievement cards.

Semifinal examinations will therefore be composed of oral theoretical questions and the identification/description of one (or, if necessary, two) histological specimen.

Obligatory dissection work – every student is required to produce a fully dissected specimen during the 2nd, 3rd or the 4th semester to be exempted from the dissection part of the final examination. The specimen will be evaluated by a departmental jury in the end of the 3rd semester.

Notebooks should be used regularly in **histology lab sessions** in order to prepare schematic drawings of the histological specimens. Students will be asked to present their histology notebooks, containing the drawings, during the semifinal or final exams.

*N.B. – In case, neither the first nor the repeated takes of a semifinal exam have been successful and so the exam has to be postponed to the following, winter, exam period (i.e. 'CV' exam), only those students will be allowed to go for a **CV course** whose average score of the midterm tests is equal, or higher than 2.00.*

Please note, that a successful semifinal examination in Ana2 is the prerequisite of registering for Ana3.

RULES AND REGULATIONS IN THE DISSECTING ROOM

IT IS STRICTLY FORBIDDEN to eat, drink, smoke, to chew gums, or to use music devices or phones.

Bags and coats should be left in the lockers before entering the dissecting room.

The lockers will have to be locked using your padlocks.

Please, remember to keep your valuables always on you, or lock them in the lockers since the department takes no responsibility for lost items.

Everybody is supposed to behave in the dissecting room conforming to the spirit of the site. Loud speech, out-of-place jokes and any kind of behaviour, disregarding the dignity of human corpses, should strictly be avoided.

Students are expected to be prepared for the practical work.

Students should take care of the furniture and equipment of the dissecting room. Do not sit on the dissection tables or stand on the tripod stools to avoid accidents. **Fire and work safety regulations** should be maintained. The dissection room is a hazard area. **Cleanliness and order** should be kept.

Working in the dissection room involves the use of **sharp and pointed tools**, injuries should be reported to the lab instructor. The technical personnel will provide first aid when necessary.

The white lab coats should be worn while in the dissection room, but should be removed before leaving the dissection room area. The purpose of wearing the lab coats is to protect one's clothing from contacting the cadaver specimen. Furthermore we advise you to wear closed toed shoes and clothing covering the legs. In the end of the class, lab coats should be emptied and left in order on the coat hangers. The department is not responsible for valuables left in the dissecting room.

Only the members of the study group can participate in the sessions, visitors may be present only with prior permission by the lab instructor. Students can leave the sessions only with the approval of the lab instructor.

It is strictly forbidden to take photos or videos of specimen during practical classes or consultations.

Specimen preparations should be wrapped and labeled. Dissection materials of other groups or individuals should not be handled. Dissected cadaver pieces should be discarded in a designated container and discarded blades have to be collected separately.

Dissecting rooms are closed between 6:00 PM to 8:00 AM and over the weekends Students may not stay in the dissecting room without the supervision of one of the assistants of the department. In the absence of an instructor, the technical personnel should ask the students to leave the dissecting room.

SMOKING IS STRICTLY FORBIDDEN ON THE DEPARTMENTAL PREMISES, INCLUDING THE GARDEN AND THE YARD!

EM I.

Subject matter of the 2nd semester

I. Morphology, histology and development of the cardiovascular system:

1. Heart
2. Vessels in general
3. Pulmonary circulation
4. Systemic circulation
5. Veins
6. Fetal circulation
7. Lymphatic system

II. Morphology, histology and development of the internal organs

1. Gastrointestinal tract
2. Respiratory system
3. Urogenital apparatus
4. Separation of body cavities
5. Pelvic floor, perineum and hernia canals

III. Composition of the abdominal and thoracic walls

Test I.

Topic: Cardiovascular system (morphology, development, vessels and nerves of the heart; pericardium, development of arteries and veins, fetal circulation)

Date: 4th study week, February 23 – 27 1st class of the week

Test II. (*Histology*)

Topic: Histology of the vessels, lymphatic organs and of the gastrointestinal tract

Date: 8th study week, March 23 – 27

Test III.

Topic: Morphology and development of the gastrointestinal and respiratory tracts.

Date: 11th study week, April 20 – 24 1st class of the week

Test IV.

Topic: Urogenital system

Date: during week 14 with the Instructor of the group

Semester-end pin test

Topic: Identical to the midterm topics

Date: TBA, during weeks 12-13

Semifinal examination

Topic: Subject matter of the semester

- 1) Histology of the internal organs (slide).
- 2) Theoretical questions (oral examination)

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2014/2015 Second Semester

Week	Lectures Mon 8.00 – 9.40 Thur 13.00 – 13.45	Practical sessions	
		Dissection room	Histology lab
1st week Feb 2 - 5	1. Circulatory system, composition, significance. Chambers of the heart, external features 2. Histology of the vessels 3. Lymphatic tissue, lymphatic organs 1- lymph node, tonsils	Dissection of heart, visceral complex	Vessels: arteries, veins, arterioles, venules, capillaries. Lymphatic organs: lymph node
2nd week Feb 9 -13	4. Structure of heart wall, myocardium, valves, anuli fibrosi 5. Lymphatic organs 2 - spleen, thymus 6. Vessels, innervation, conducting system, surface projection of the heart, pericardium	Dissection of heart, visceral complex, fresh heart	Lymphatic organs: tonsils, spleen, thymus
3rd week Feb 16 - 20	7. <i>Development of the heart, 1.</i> 8. <i>Development of the heart 2, malformations. (Film)</i> 9. <i>Development of the arteries and veins; malformations. Fetal circulation</i>	Dissection of heart, visceral complex	Oral cavity: lip, filiform, fungiform vallate papillae, radix linguae
4th week Feb 23 – 27	10. Gastrointestinal tract. Oral cavity: morphology and histology of the tongue and salivary glands 11. Morphology, histology and development of teeth. 12. Morphology and histology of soft palate, isthmus of fauces and pharynx	1. 1st Midterm Heart, great vessels, development of the heart and vessels, fetal circulation 2. Cadaver dissection: superficial abdominal, thoracic and cervical regions	Ground teeth, tooth bud. Parotid, submandibular, sublingual glands
5th week Mar 2 - 6	13. Fine structure of the hollow and parenchymal viscera Morphology and histology of the oesophagus 14. Morphology and histology of the stomach 15. Morphology and histology of the duodenum and pancreas	Cadaver dissection: superficial abdominal, thoracic and cervical regions	Gastrointestinal tract: Oesophagus, cardia, fundus, pylorus of the stomach
6th week March 9 – 13	16. Morphology and histology of the small intestine 17. Morphology and histology of the large intestine and rectum. 18. <i>Development of the face, and palate, congenital malformations (film)</i>	Cadaver and visceral complex dissection. Opening of the body cavities. Optional counsultational class for Groups 2 and 7 on Friday	Duodenum, jejunum ileum, colon, vermiform appendix Optional class for Groups 1-6 on Friday
7th week March 16 - 20	19. Morphology of the liver and biliary system. Portal vein 20. Histology of the liver and biliary system 21. <i>Development of the branchial apparatus</i>	Cadaver and visceral complex dissection. Demonstration of peritoneum, abdominal organs, vessels.	Liver, gall bladder, pancreas
8th week March 23 - 27	22. <i>Development of the fore-, mid- and hindgut</i> 23. Peritoneum 24. Morphology of the nasal cavity and paranasal sinuses.	Cadaver and visceral complex dissection. Demonstration of peritoneum, abdominal organs, vessels.	2nd Midterm Vessels, heart, lymphatic organs, gastrointestinal tract
Easter Holiday March 30 – April 3			
9th week Apr 6 - 10	25. Easter Monday 26. Easter Monday 27. Larynx, cartilages, joints, muscles connective tissue skeleton, mucous membrane. Morphology of the trachea.	1. No dissection class for Groups 1-6 on Monday 2. Demonstration of thoracic and abdominal situs on fresh and embalmed cadavers	Respiratory system: larynx, trachea, lung. Optional histology class for Gr 7 at 13.00 and Gr 8 at 15.00 on Thursday
10th week Apr 13- 17	28. Morphology of the lung. Pleura, mediastinum. 29. Histology and development of the respiratory system 30. Morphology of the kidney, t and of the urinary passages	Cadaver and visceral complex dissection (abdominal organs)	Urinary system: kidney, ureter, urinary bladder
11th week Apr 20 - 24	31. Histology of the kidney, the urinary passages, pelvis, ureter, bladder 32. Morphology and histology of the testicle Coats of the testicles, spermatic cord, hernia canals 33. Meiosis. Spermatogenesis and oogenesis	1. 3rd Midterm Anatomy and dev. of gastrointestinal and respiratory systems, structure of the body wall 2. Retroperitoneum, kidney, ureter, suprarenal gland, pancreas, vessels	Male genital system: testis, epididymis, spermatic cord
12th week Apr 27 – May 1 <i>April 28 is Faculty Day Competition 1</i>	34. Morphology and histology of the epididymis, seminal vesicle and prostate 35. Morphology and histology of penis and male urethra 36. Structure of pelvic floor, male perineum	April 28. No class for Groups 7-8 May 1 No class for Groups 1-8 Retroperitoneum, kidney, ureter, suprarenal gland, pancreas, vessels	May 1 No class for Gr 1-6 (optional class on Thursday at 15.00) Male genital system: Seminal vesicle, prostate, penis, glans penis.
13th week May 4 - 8 Competition 2 PIN TEST	37. Morphology and histology of the ovary and the uterine tube 38. Morphology and histology of the uterus, divisions and content of the broad ligament 39. Morphology and histology of the vagina and the external genital organs, female perineum	Dissection of abdominal and pelvic visceral complexes Demonstration of the pelvic situs	Female genital system: ovary, corpus luteum, uterine tube
14th week May 11 - 15 PIN TEST	40. Development of the serous membranes, separation of body cavities 41. Development and malformations of the urinary system 42. Development and malformations of the genital system. Disorders of the sexual differentiation. Hermaphroditism Announcement of the competition results	1. Internal test: urogenital apparatus, pelvic floor, perineum, hernia canals 2. General revision	Female genital system: uterus (proliferation, secretion), vagina

Faculty of Medicine First Year EM I 9 – 16

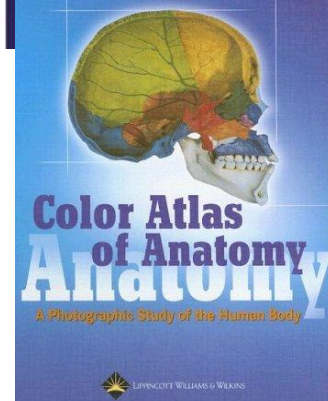
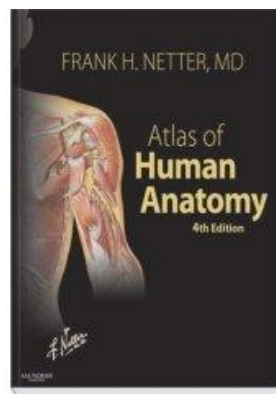
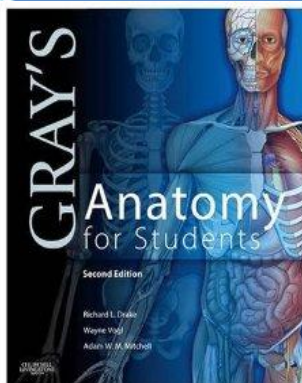
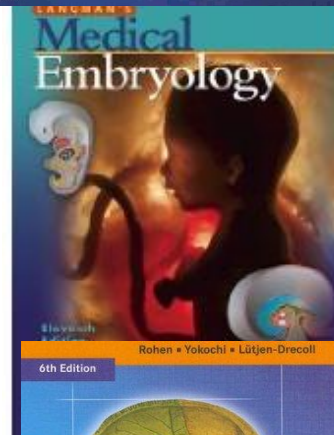
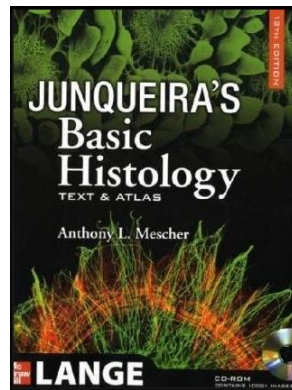
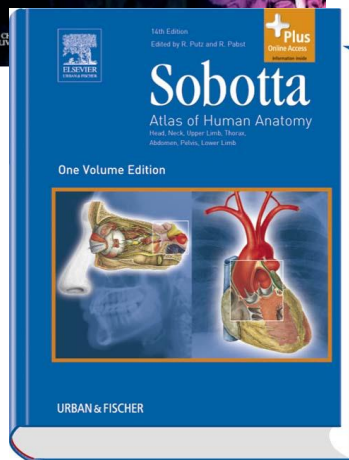
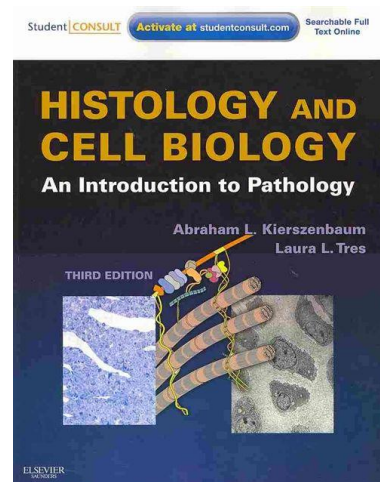
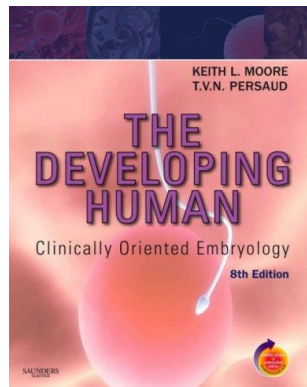
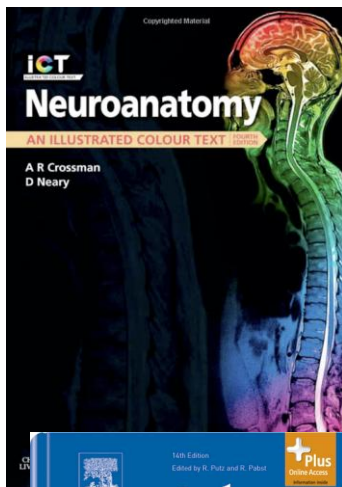
2014/2015 Second Semester

Week	Lectures Tue 8.45 – 9.30 Fri 8.00 – 9.40	Practical sessions	
		Dissection room	Histology lab
1st week Feb 2 - 5	1. Circulatory system, composition, significance. Chambers of the heart, external features 2. Histology of the vessels 3. Lymphatic tissue, lymphatic organs 1- lymph node, tonsils	Dissection of heart, visceral complex	Vessels: arteries, veins, arterioles, venules, capillaries. Lymphatic organs: lymph node
2nd week Feb 9 -13	4. Structure of heart wall, myocardium, valves, anuli fibrosi 5. Lymphatic organs 2 - spleen, thymus 6. Vessels, innervation, conducting system, surface projection of the heart, pericardium	Dissection of heart, visceral complex, fresh heart	Lymphatic organs: tonsils, spleen, thymus
3rd week Feb 16 - 20	7. <i>Development of the heart, 1.</i> 8. <i>Development of the heart 2, malformations. (Film)</i> 9. <i>Development of the arteries and veins; malformations. Fetal circulation</i>	Dissection of heart, visceral complex	Oral cavity: lip, filiform, fungiform vallate papillae, radix linguae
4th week Feb 23 – 27	10. Gastrointestinal tract. Oral cavity: morphology and histology of the tongue and salivary glands 11. Morphology, histology and development of teeth. 12. Morphology and histology of soft palate, isthmus of fauces, pharynx	1. 1st Midterm Heart, great vessels, heart and vessels' development, fetal circulation 2. Cadaver dissection: superficial abdominal, thoracic and cervical regions	Ground teeth, tooth bud. Parotid, submandibular, sublingual glands
5th week Mar 2 - 6	13. Fine structure of the hollow and parenchymal viscera. Morphology and histology of the oesophagus 14. Morphology and histology of the stomach 15. Morphology and histology of the duodenum and pancreas	Cadaver dissection: superficial abdominal, thoracic and cervical regions	Gastrointestinal tract: Oesophagus, cardia, fundus, pylorus of the stomach
6th week March 9 – 13	16. Morphology and histology of the small intestine 17. Morphology and histology of the large intestine and rectum. 18. <i>Development of the face, and palate, congenital malformations (film)</i>	1. Cadaver and visceral complex dissection. Opening of the body cavities. 2. Optional consultational class for Grs 9-12, 14 on Friday	Duodenum, jejunum ileum, colon, vermiform appendix (Groups 13-16 optional consultational class on Thursday)
7th week March 16 - 20	19. Morphology and histology of the liver and biliary system. Portal vein 20. <i>Development of the branchial apparatus</i> 21. <i>Development of the fore-, mid- and hindgut</i>	Cadaver and visceral complex dissection. Demonstration of peritoneum, abdominal organs, vessels.	Liver, gall bladder, pancreas
8th week March 23 - 27	22. Morphology of the nasal cavity and paranasal sinuses. 23. Larynx, cartilages, joints, muscles 24. Larynx, connective tissue skeleton, mucous membrane	Cadaver and visceral complex dissection (abdominal organs, vessels)	2nd Midterm Vessels, heart, lymphatic organs, gastrointestinal tract
Easter Holiday March 30 – April 3			
9th week Apr 6 - 10	25. Morphology of the trachea and the lung. Pleura, mediastinum 26. Histology and development of the respiratory system 27. Morphology of the kidney, the urinary passages, pelvis, ureter, bladder	1. No class for Groups 13-16 on Monday 2. Demonstration of thoracic and abdominal situs on fresh and embalmed cadavers	Respiratory system: larynx, trachea, lung. Optional histology class for Gr 10 at 13.00 and Gr 9,11,12 at 15.00 on Thurs
10th week Apr 13- 17	28. Histology of the kidney, the urinary passages, pelvis, ureter, bladder 29. Morphology of the testicle. Coats of the testicles Spermatic cord, hernia canals 30. Meiosis. Spermatogenesis and oogenesis	Cadaver and visceral complex dissection (abdominal organs, vessels)	Urinary system: kidney, ureter, urinary bladder
11th week Apr 20 - 24	31. Morphology and histology of the epididymis, seminal vesicle and prostate 32. Morphology and histology of penis and male urethra 33. Structure of the pelvic floor, male perineum	1. 3rd Midterm Anatomy and dev. of gastrointestinal and respiratory systems, structure of the body wall 2. Retroperitoneum, kidney, ureter, suprarenal gland, pancreas, vessels	Male genital system: testis, epididymis, spermatic cord,
12th week Apr 27 – May 1 April 28 is Faculty Day Competition 1	34. Faculty Day 35. May 1 is holiday 36. May 1 is holiday	April 28 No class for Grs 7-12 May 1 No class for Groups 9, 10, 11, 12, 14 Retroperitoneum, kidney, ureter, suprarenal gland, pancreas, vessels	Male genital system: Seminal vesicle, prostate Penis, glans penis.
13th week May 4 - 8 Competition 2 PIN TEST	37. Morphology and histology of the ovary and the uterine tube 38. Morphology and histology of the uterus, divisions and content of the broad ligament 39. Morphology and histology of the vagina and the external genital organs, female perineum	Dissection of abdominal and pelvic visceral complexes Demonstration of pelvic situs	Female genital system: ovary, corpus luteum, uterine tube
14th week May 11 - 15 PIN TEST	40. Development of the serous membranes, separation of body cavities 41. Development and malformations of the urinary system 42. Development and malformations of the genital system. Disorders of the sexual differentiation. Hermaphroditism Announcement of the competition results	1. Internal test: urogenital apparatus, pelvic floor, perineum, hernia canals 2. General revision	Female genital system: uterus (proliferation, secretion), vagina

EM I
Histological specimens
2014/2015 2nd semester

Week	Slides
1st week Feb 2 - 5	Vessels 50. Elastic artery (carotid artery, HE) Demonstration : 15. Elastic artery (RF) 51. Medium-sized artery and vein (HE) 55. Arterioles, capillaries, venules (Fungiform papilla - HE) Demonstration.: Muscular artery and vein (RF) Lymphatic organs 47. Palatine tonsil (HE) 48. Lingual tonsil (HE) Demonstration: Pharyngeal tonsil (HE)
2nd week Feb 9 - 13	44. Lymph node (HE) - Demonstration: Lymph node (Ag-impr.) 45. Spleen (HE) 46. Spleen -white pulp (perfused preparation, HE) 49. Thymus (HE) Demonstration: Thymus adiposus (HE)
3rd week Feb 16 - 20	Gastro-intestinal organs 53. Lip (HE) 54. Filiform papillae (tongue, HE) 55. Fungiform papillae and small vessels (tongue, HE) 56. Circumvallate papillae (tongue, HE) Demonstration: Foliate papilla (HE) 48. Root of the tongue (lingual tonsil (HE)
4th week Feb 23 – 27	57. Developing tooth (Azan stain) Demonstration: Ground tooth (unstained) 58. Parotid gland (HE) 13. Submandibular gland, HE 60. Submandibular gland (haematoxylin and mucicarmine stain) 59. Sublingual gland (HE)
5th week Mar 2 - 6	5. Esophagus, HE 61. Esophago-gastric junction (cardia) (HE) 62. Stomach (fundus) (HE) 63. Stomach (fundus) (PAS-Congo-haematoxylin stain) 64. Pylorus (gastro-duodenal junction).(HE)
6th week March 9 – 13	65. Duodenum (HE) 30. Jejunum (HE) 66. Ileum (HE) 10. Colon (HE) 67. Vermiform appendix (HE)
7th week March 16 - 20	68. Liver (Azan stain) 69. Liver (human, HE) 16. Liver, (silver nitrate impregnation) Demonstration: Liver (ink injected) 3. Gall bladder, HE 70. Pancreas (HE)
8th week March 23 - 27	2nd Midterm: Vessels, lymphatic organs and digestive system
March 30 – April 3 Easter Holiday	
9th week Apr 6 - 10	Respiratory system 71. Larynx (HE) 72. Trachea (HE) 73. Lung (HE) Demonstration: Lung (RF); Fetal lung (HE)
10th week Apr 13 - 17	Urinary system 2. Kidney (HE) Demonstration: Kidney (Tri-PAS) 91. Ureter (HE) 8. Urinary bladder, HE
11th week April 20 - 24	Male genital system 74. Testis (HE) 4. Epididymis (HE) 75. Spermatic cord (HE)
12th week Apr 27 – May 1	Male genital system 76. Seminal vesicle (HE) 12. Prostate gland (HE) 7. Penis (HE) 77. Glans penis (HE)
13th week May 4 – 8	Female genital system 78. Ovary (HE) 79. Ovary, corpus luteum (HE) 80. Uterine tube (oviduct) (HE)
14th week May 11 - 15	Female genital system 81. Uterus, proliferation phase (HE) 82. Uterus, secretory phase (HE) 84. Vagina (HE)

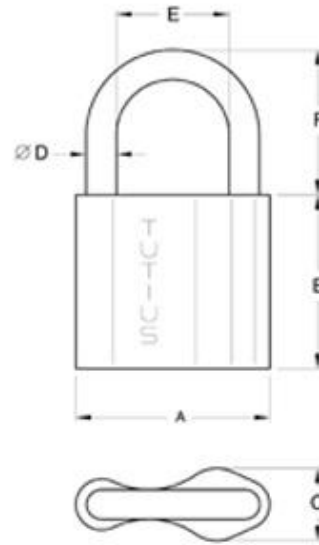
RECOMMENDED BOOKS



During dissection classes keep your belongings in the lockers and lock them with your padlock!

PADLOCK SIZE: 6 mm

Please, remember to keep your valuables always on you, or lock them in the lockers since the department takes no responsibility for lost items.



DISSECTION ROOM TOO

SCALPEL



OR



A PAIR OF ANATOMICAL FORCEPS



RUBBER GLOVES



**PROTECTIVE CLOTHING
(LABCOAT)**

GOGGLES



TOPICS OF THE SEMIFINAL EXAM

Academic year 2014/2015

Histology exam (office)

Description of a histological specimen **with the help of a microscope**

Further theoretical issues related to the inspected slide

Theory questions (office)

CELL BIOLOGY

The main steps, two basic types and regulation of meiotic cell division. Crossing over.

Place and time of meiotic divisions in the human body. The reasons of having two different gametes, the comparisons of the male and female gametes, developmental relevances.

Composition of a sperm.

CIRCULATORY SYSTEM

Shape, external features of heart

Chambers of heart

Endocardium, ostia, valves of heart

Skeleton of heart, anuli fibrosi

Structure of heart wall

Cardiac muscle, myocardium

Impulse 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

Development of heart tube

Development of atria (septum primum and secundum, foramen ovale)

Development of ventricles (interventricular septum)

Pulmonary circulation

Ascending aorta, arch of aorta and its branches

Common and external carotid artery and their branches

Maxillary artery and its branches

Subclavian artery and its branches

Thoracic aorta and its branches

Abdominal aorta and its branches

Coeliac trunk and its branches

Superior mesenteric artery and its branches

Inferior mesenteric artery and its branches

External and internal iliac artery and its 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
Veins of face and neck
Cutaneous veins and lymphatic vessels of trunk
Microscopic structure of arterial and arteriolar wall
Microscopic structure of capillary wall
Development of aorta and branchial (pharyngeal) arch arteries
Development of great veins (caval, portal, azygos)
Fetal circulation
Microscopic structure of the wall of venules, veins and lymphatic vessels

LYMPHATIC ORGANS

Tonsils (anatomy, histology, embryology)
Spleen (anatomy, histology, embryology)
Thymus (anatomy, histology, embryology)
Lymphatic vessels and nodes of head and neck
Lymphatic vessels and nodes of mediastinum
Lymphatic vessels and nodes of retroperitoneal space
Lymphatic vessels and nodes of pelvis
Thoracic duct and right lymphatic duct
Microscopic structure of lymphatic system (reticular cells, lymphocytes, plasma cells, antibodies, lymphatic follicles)
Microscopic anatomy of lymph nodes

DIGESTIVE SYSTEM

Oral cavity (divisions, boundaries)
Floor of mouth, sulcus lateralis linguae
Types and morphology of teeth
Orientation and supporting structures of teeth
Dental arch and dental formula, blood and nerve supply of teeth
Microscopic anatomy of oral tissues (enamel, dentin, cementum, periodontal ligament, alveolar bone, gum)
Development of teeth
Microscopic anatomy of dental development
Tongue (parts, vessels, innervation)
Microscopic anatomy and development of the tongue
Salivary glands (anatomy, histology, embryology)
Isthmus of fauces
Palate, palatine muscles
Development of face, hare lip
Development of nasal cavity and paranasal sinuses
Development of palate, cleft palate
Pharynx, (shape, position, parts, muscles)

Topography of the pharynx, para and retropharyngeal spaces
Structure and development of branchial (pharyngeal) arches
Derivatives of branchial (pharyngeal) arches
Development and derivatives of branchial (pharyngeal) pouches
Branchial (pharyngeal) grooves
Oesophagus (anatomy, histology, embryology)
Derivatives of foregut (pharynx, oesophagus, stomach, duodenum)
Stomach (shape, position, parts)
Peritoneal relations of stomach
Blood supply and innervation of stomach
Microscopic anatomy of stomach
Duodenum (shape, position, divisions, vessels)
Jejunum-ileum (shape, position, vessels)
Microscopic anatomy of small intestine
Fine structure of the intestinal villi
Large intestine (shape, position, divisions, vessels)
Microscopic anatomy of large intestine
Structure of enteroendocrine cells
Microscopic anatomy of vermiform appendix
Rectum, anal canal (shape, position, vessels)
Microscopic anatomy of rectum and anal canal
Liver (shape, position; development)
Gall bladder and biliary passages (anatomy, histology, embryology)
Liver (peritoneal relations, vessels)
Microscopic anatomy of the liver
Circulation of liver, liver sinusoids
Microscopic anatomy of gall bladder and extrahepatic biliary tracts
Pancreas (shape, position, vessels)
Microscopic anatomy and development of the pancreas
Peritoneum omenta, mesentery, omental bursa
Rotation and derivatives of midgut, physiological umbilical hernia
Development of hindgut
Development and separation of body cavities
Development of the peritoneum
Development of diaphragm

RESPIRATORY SYSTEM

Nose, nasal cavity (boundaries, nasal meatus, vessels)
Paranasal sinuses (connections, vessels)
Larynx (shape, position, vessels, nerves)
Skeleton and joints of larynx
Laryngeal ligaments (fibroelastic membranes, mucous membrane)
Muscles of larynx, innervation
Microscopic structure and development of the larynx
Trachea and bronchial tree (anatomy, histology and development)
Lung (shape, parts, surfaces, hilum)
Lung (position, vessels, nerves)

Pleura, pleural cavity
Surface projection of pleura and lung
Microscopic structure and development of the lung

UROGENITAL SYSTEM

Kidney (shape, position, hilum, sinus, capsules)
Kidney (section, vascular architecture)
Microscopic anatomy of kidney
Microscopic anatomy of juxtaglomerular apparatus
Vascular architecture of kidney
Development of kidney and ureter (pronephros, mesonephros, metanephros)
Renal pelvis and calyces
Ureter (anatomy, histology and embryology)
Urinary bladder (shape, position, muscles, vessels)
Microscopic anatomy and development of the urinary passages
Differentiation of the urogenital sinus
Female urethra (anatomy, histology and embryology)
Testis (shape, position, vessels)
Microscopic anatomy of testis, spermatogenesis
Development of testis
Epididymis, vas (ductus) deferens, spermatic cord (anatomy, histology and embryology)
Scrotum, coats of testis
Seminal vesicle (anatomy, histology and embryology)
Prostate (anatomy, histology and embryology)
Development of male genital ducts and glands
Male urethra, bulbourethral gland (anatomy, histology and embryology)
Penis (shape, position, mechanism of erection, vessels, nerves)
Microscopic anatomy of penis and male urethra
Pelvic floor, male perineum
Hernia canals (inguinal and femoral)
Development of the male external genital organs
Ovary (shape, position, vessels)
Microscopic anatomy of ovary, oogenesis
Microscopic anatomy of corpus luteum
Development of ovary
Uterine tube (shape, position, vessels; histology, embryology)
Uterus (shape, parts, wall, cavity)
Uterus (position, supporting structures, vessels)
Broad ligament (lig. latum) and its components
Microscopic anatomy of uterus, menstrual cycle
Vagina, female perineum
External female genital organs (mons pubis, labia, vestibule of vagina, greater vestibular gland, vessels)
Development of female genital tracts
Microscopic anatomy of vagina and external genitalia
Development of the female external genital organs