

Semmelweis University
Department of Anatomy, Histology and Embryology

Faculty of Medicine
1st year 2nd semester

ANATOMY HANDBOOK



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Course Director, English Language Program

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Professor and Rector
Head of Department



Anatomy, Histology and Embryology for EM students

TEACHING DEPARTMENT:

SEMMELWEIS UNIVERSITY

Department of Anatomy, Histology and Embryology

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H-1094 Budapest

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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

Signature/acceptance of the semester: 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 semester, both practical and theoretical knowledge will regularly be evaluated. The midterm tests are obligatory and cannot be done at a different time, neither can they be retaken. The anatomy and histology midterms may be oral or written exams. **Anatomy** midterms include both identification of several structures on the specimen and theoretical questions related to the subject. **Histology** midterms include the identification of a certain number of structures in slides, as well as, theoretical questions related to embryology. The results of all tests will appear on the personal achievement cards.

A semester practical mark is calculated from the midterm marks together with the personal achievement mark given by the group instructor. This practical mark will be counted into the semifinal examination and will be written on the personal achievement cards.

Semifinal examinations are composed of the following parts:

1. written pretest
2. oral examination (practical and theoretical questions in Macroscopy and Histology) and the identification/description of two histological specimen.

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 and final exams.

*N.B. – In case, when neither the first nor the repeated takes of a semifinal exam have been successful during the summer examination period, the students may register for a CV course and sit for an exam in the following winter examination period, but they cannot continue with their studies because a **successful ANA2 semifinal exam is the prerequisite of registering for the following ANA3 semester**. Those, who opt for a regular course, will have to again register for ANA2 in the 2nd semester of the following academic year (2017/2018).*

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

Heart and its associated structures (vessels and pericardium)

Vessels in general

Pulmonary circulation

Systemic circulation (subclavian, external carotid arteries, thoracic and abdominal aortae, branches of the internal iliac artery, superior and inferior venae cavae, together with the tributaries of the hepatic portal vein)

Fetal circulation

Lymphatic system

II. Morphology, histology and development of internal organs

Gastrointestinal tract

Respiratory system

Urogenital apparatus

Serous membranes (pleura and peritoneum), separation of body cavities

Pelvic floor, perineum, hernia canals

III. Structure of the thoracic/abdominal wall

Test I.

Topic: Heart, great vessels, development. Morphology and development of the internal organs of the head, neck and the thoracic cavity. Structure and development of the diaphragm.

Date: 7th study week, March 17.

Test II.

Topic: Histology of the cardiovascular system, lymphatic organs and the digestive tract

Date: 9th study week, March 27. or 31.

Semifinal examination

Topic: Subject matter of the semester

1. Written test

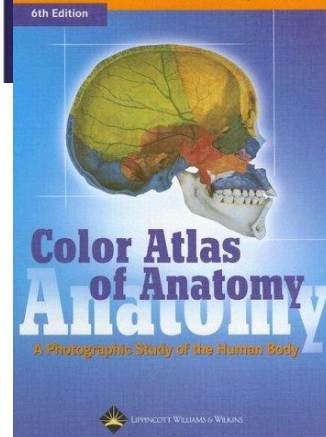
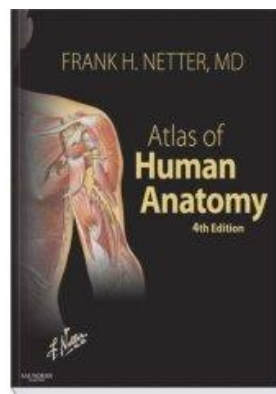
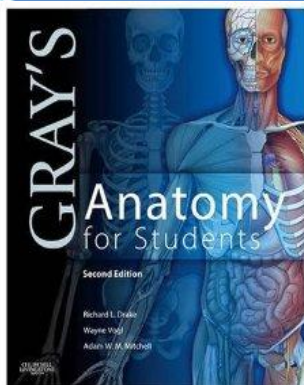
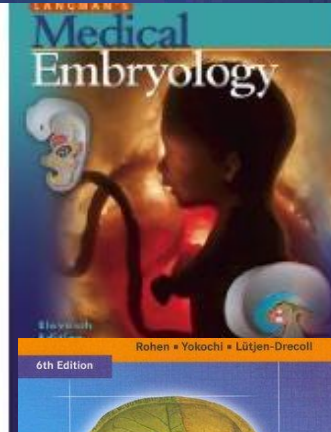
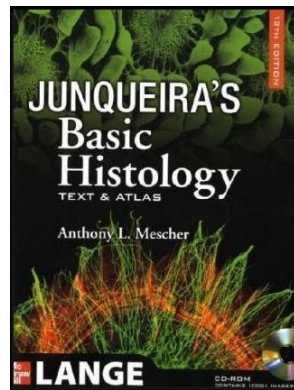
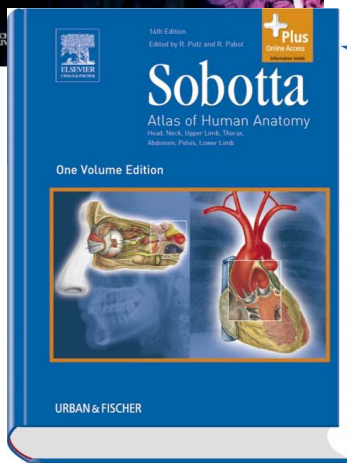
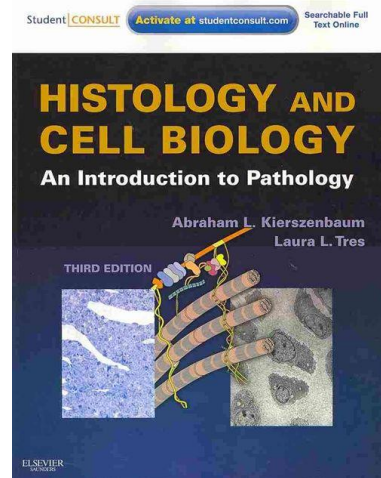
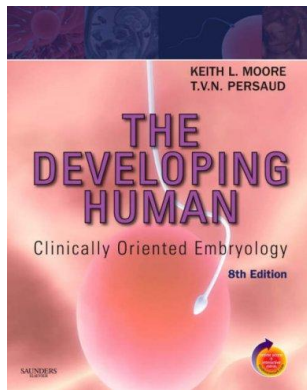
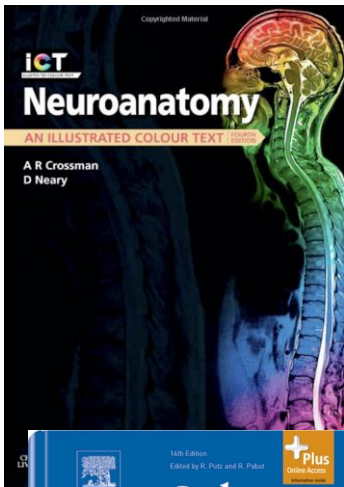
2 Oral /practical examination in Anatomy and Histology (prosections and 2 histological slides)

Week	Lectures <i>Mon 8.00-9.40, Thursday 13.30-14.15</i>	Practical sessions	
		Dissection room	Histology lab
Week 1 Jan. 30- Febr. 3.	1. Histology of the vessels. Lymphatic tissue, cellular elements, thymus 2. Lymph node. Structure and circulation spleen. Tonsils, MALT. 3. Chambers of the heart, external features	Dissection of heart, visceral complex	Vessels: arteries, veins, arterioles, venules, capillaries. Lymphatic organs: thymus
Week 2. Febr. 6- 10.	4. Structure of heart wall, myocardium, valves, anuli fibrosi Anatomical basis for heart valve malformations 5. Vessels and the conducting system of the heart. 6. Pericardium, position and surface projection of the heart. Auscultation points. Myocardial infarct.	Dissection of heart, visceral complex	Lymphatic organs: lymph node, spleen, tonsils
Week 3. Febr. 13- 17.	7. Development of the heart, malformations 8. Development of the arteries and veins; malformations. Fetal circulation 9. Gastrointestinal tract. Oral cavity, morphology and histology of the tongue.	Cadaver dissection Superficial abdominal, thoracic and cervico-facial regions Dissection of heart, visceral complex	Heart. Gastrointestinal tract: lip, tongue, including the filiform, fungiform and vallate papillae
Week 4. Febr. 20- 24.	10. Morphology, histology and development of teeth and salivary glands. 11. Morphology and histology of soft palate, isthmus of fauces and pharynx 12. Fine structure of the hollow and parenchymal viscera Morphology and histology of the oesophagus	Cadaver dissection Oral cavity, tongue, salivary glands, cervico-facial regions Dissection of the visceral complex	Ground teeth, tooth bud. Submandibular, sublingual glands
Week 5. Febr. 27- March 3.	13. Morphology of the nasal cavity and paranasal sinuses Larynx, cartilages, joints, muscles connective tissue skeleton, mucous membrane. 14. Histology of the respiratory tract. Development of the lungs, Respiratory distress syndrome. 15. Morphology of the trachea and the lung. Pleura	Cadaver dissection, head and neck region. Nasal cavity, larynx Surface projections of thoracic organs. Thoracic cavity.	Respiratory system: larynx, trachea, lung
Week 6. March 6- 10.	16. Thorax, respiratory actions. Structure and development of the diaphragm 17. Development of the face, and palate, congenital malformations 18. Development of the branchial apparatus, congenital malformations	Cadaver dissection No class on Friday for Grs 7-10 Superficial abdominal, thoracic and cervico-facial regions Dissection of the visceral complex	Digestive system: Oesophagus, cardia, fundus, pylorus of the stomach No class for Grs 13-14
Week 7. March 13- 17.	19. Abdominal wall, rectus sheath 20. Morphology and histology of the stomach 21. Morphology and histology of the duodenum and the pancreas	1. Dissection No class for Grs 11, 12, 15, 16 2. Midterm test 1 Morphology and development of the heart and vessels. Visceral organs of the head, neck and thorax. Morphology and development of the diaphragm. Thoracic wall	ALL other groups: Duodenum, jejunum ileum, colon, vermiform appendix Grs 13-14: Oesophagus, cardia, fundus, pylorus of the stomach Duodenum, jejunum
Week 8. March 20- 24.	22. Morphology and histology of the jejunum and ileum 23. Morphology and histology of the large intestine and rectum. 24. Morphology of the liver and biliary system. Portal vein	Cadaver dissection Thoracic and abdominal internal organs Dissection of the visceral complex.	ALL other groups: Liver, gall bladder, pancreas Grs 13-14: ileum, colon, appendix Liver, gall bladder, pancreas
Week 9. March 27- 31.	25. Histology of the liver and biliary system 26. Development of the mid- and hindgut. Development of the liver and the pancreas 27. Peritoneum. Development of the serous membranes and the omental bursa. Separation of body cavities	Cadaver dissection: organs supplied by the superior mesenteric artery	Midterm test 2 Vessels, heart, lymphatic organs, respiratory and digestive tracts
Week 10. April 3-7.	28. Morphology and topography of the kidney. Capsules. Urinary passages, urinary bladder 29. Histology of the urinary system 30. Morphology and histology of the testicle. Spermatogenesis	Cadaver dissection: organs supplied by the inferior mesenteric artery	Urinary system: kidney, ureter, urinary bladder
April 10-14 Easter break			
Week 11. April 17- 21.	31. Easter Monday 32. Easter Monday 33. Morphology and histology of the epididymis, spermatic cord, seminal vesicle and prostate. Coats of the testicles. Inguinal canal	Cadaver dissection Retroperitoneum, kidney Dissection of the visceral complex	Male genital system: testis, epididymis, spermatic cord
Week 12. April 24- 28.	34. Morphology and histology of penis and male urethra. Endoscopy of the male urinary passages Structure of pelvic floor, male perineum 35. Morphology and histology of the ovary, the uterine tube, oogenesis the uterus, divisions and content of the broad ligament 36. Morphology and histology of the vagina and the external genital organs, female perineum	Cadaver dissection No class for Grs 11, 12, 15, 16 on Wednesday Male reproductive system	Male genital system: Seminal vesicle, prostate, penis, glans penis.
Week 13. May 2-5 <i>competiti on 1st round</i>	37. May 1 - holiday 38. May 1 - holiday 39. Development and malformations of the kidney and the urinary system	Cadaver dissection Female reproductive system No class for Grs 1-5, 12-15, 17 on Monday	Female genital system: ovary, corpus luteum, uterine tube uterus (proliferation, secretion), vagina No class for Grs 6-12, 15-17 on Monday
Week 14. May 8-12 <i>competiti on 2nd round</i>	40. Development and malformations of the genital system. 41. Clinical and radiologic anatomy of the internal organs 42. Lymphatic drainage of the head&neck, thoracic and abdominal regions	Group revision - test 3 : Abdominal wall, abdominal organs; Macroscopy of the urogenital system, pelvic and urogenital diaphragms, hernia canals	Revision Grs 6-12, 15-17: ovary, corpus luteum, uterine tube uterus (proliferation, secretion), vagina

Week	Lectures <i>Tuesday 9.50-10.35, Friday 8.00-9.40</i>	Practical sessions	
		Dissection room	Histology lab
Week 1 Jan. 30- Febr. 3.	1. Histology of the vessels. Lymphatic tissue, cellular elements, thymus 2. Lymph node. Structure and circulation spleen. Tonsils, MALT. 3. Chambers of the heart, external features	Dissection of heart, visceral complex	Vessels: arteries, veins, arterioles, venules, capillaries. Lymphatic organs: thymus
Week 2. Febr. 6- 10.	4. Structure of heart wall, myocardium, valves, anuli fibrosi Anatomical basis for heart valve malformations 5. Vessels and the conducting system of the heart. 6. Pericardium, position and surface projection of the heart. Auscultation points. Myocardial infarct.	Dissection of heart, visceral complex	Lymphatic organs: lymph node, spleen, tonsils
Week 3. Febr. 13- 17.	7. Development of the heart, malformations 8. Development of the arteries and veins; malformations. Fetal circulation 9. Gastrointestinal tract. Oral cavity, morphology and histology of the tongue.	Cadaver dissection Superficial abdominal, thoracic and cervico-facial regions Dissection of heart, visceral complex	Heart. Gastrointestinal tract: lip, tongue, including the filiform, fungiform and vallate papillae
Week 4. Febr. 20- 24.	10. Morphology, histology and development of teeth and salivary glands. 11. Morphology and histology of soft palate, isthmus of fauces and pharynx 12. Fine structure of the hollow and parenchymal viscera Morphology and histology of the oesophagus	Cadaver dissection Oral cavity, tongue, salivary glands, cervico-facial regions Dissection of the visceral complex	Ground teeth, tooth bud. Submandibular, sublingual glands
Week 5. Febr. 27- March 3.	13. Morphology of the nasal cavity and paranasal sinuses Larynx, cartilages, joints, muscles connective tissue skeleton, mucous membrane. 14. Histology of the respiratory tract. Development of the lungs, Respiratory distress syndrome. 15. Morphology of the trachea and the lung. Pleura	Cadaver dissection, head and neck region. Nasal cavity, larynx Surface projections of thoracic organs. Thoracic cavity.	Respiratory system: larynx, trachea, lung
Week 6. March 6- 10.	16. Thorax, respiratory actions. Structure and development of the diaphragm 17. Development of the face, and palate, congenital malformations 18. Development of the branchial apparatus, congenital malformations	Cadaver dissection No class on Friday for Grs 7-10 Superficial abdominal, thoracic and cervico-facial regions Dissection of the visceral complex	Digestive system: Oesophagus, cardia, fundus, pylorus of the stomach No class for Grs 13-14
Week 7. March 13- 17.	19. Abdominal wall, rectus sheath 20. Morphology and histology of the stomach 21. Morphology and histology of the duodenum and the pancreas	1. Dissection No class for Grs 11, 12, 15, 16 2. Midterm test 1 Morphology and development of the heart and vessels. Visceral organs of the head, neck and thorax. Morphology and development of the diaphragm. Thoracic wall	ALL other groups: Duodenum, jejunum ileum, colon, vermiform appendix Grs 13-14: Oesophagus, cardia, fundus, pylorus of the stomach Duodenum, jejunum
Week 8. March 20- 24.	22. Morphology and histology of the jejunum and ileum 23. Morphology and histology of the large intestine and rectum. 24. Morphology of the liver and biliary system. Portal vein	Cadaver dissection Thoracic and abdominal internal organs Dissection of the visceral complex.	ALL other groups: Liver, gall bladder, pancreas Grs 13-14: ileum, colon, appendix Liver, gall bladder, pancreas
Week 9. March 27- 31.	25. Histology of the liver and biliary system 26. Development of the mid- and hindgut. Development of the liver and the pancreas 27. Peritoneum. Development of the serous membranes and the omental bursa. Separation of body cavities	Cadaver dissection: organs supplied by the superior mesenteric artery	Midterm test 2 Vessels, heart, lymphatic organs, respiratory and digestive tracts
Week 10. April 3-7.	28. Morphology and topography of the kidney. Capsules. Urinary passages, urinary bladder 29. Histology of the urinary system 30. Morphology and histology of the testicle. Spermatogenesis	Cadaver dissection: organs supplied by the inferior mesenteric artery	Urinary system: kidney, ureter, urinary bladder
April 10-14 Easter break			
Week 11. April 17- 21.	31. Morphology and histology of the epididymis, spermatic cord, seminal vesicle and prostate 32. Coats of the testicles. Inguinal canal 33. Morphology and histology of penis and male urethra. Endoscopy of the male urinary passages	Cadaver dissection Retroperitoneum, kidney Dissection of the visceral complex	Male genital system: testis, epididymis, spermatic cord
Week 12. April 24- 28.	34. Structure of pelvic floor, male perineum 35. Morphology and histology of the ovary and the uterine tube, oogenesis 36. Morphology and histology of the uterus, divisions and content of the broad ligament	Cadaver dissection No class for Grs 11, 12, 15, 16 on Wednesday Male reproductive system	Male genital system: Seminal vesicle, prostate, penis, glans penis.
Week 13. May 2-5 <i>competiti on 1st round</i>	37. Morphology and histology of the vagina and the external genital organs, female perineum 38. Development and malformations of the kidney 39. Development and malformations of the urinary system	Cadaver dissection Female reproductive system No class for Grs 1-5, 12-15, 17 on Monday	Female genital system: ovary, corpus luteum, uterine tube uterus (proliferation, secretion), vagina No class for Grs 6-12, 15-17 on Monday
Week 14. May 8-12 <i>competiti on 2nd round</i>	40. Development and malformations of the genital system. 41. Clinical and radiologic anatomy of the internal organs 42. Lymphatic drainage of the head&neck, thoracic and abdominal regions	Group revision - test 3 : Abdominal wall, abdominal organs; Macroscopy of the urogenital system, pelvic and urogenital diaphragms, hernia canals	Revision

Academic Year 2016/2017 Second Semester		EM I	HISTOLOGY SLIDES (<i>optimal order</i>)
Week 1 Jan. 30-Febr. 3.	Vessels, Lymphatic organs 1	91. Aorta (HE) 21. Aorta (orcein) 19. Artery of muscular type medium size vein (HE) 38. Artery of muscular type, medium size vein (orcein) 109. Pancreas (Toluidine Blue = TB) 43. Thymus (HE)	
Week 2. Febr. 6-10.	Lymphatic organs 2	47. Palatine tonsil (HE) 42. Palatine tonsil (T & B cell immunohistochemistry) 46. Lingual tonsil (HE) 48. Pharyngeal tonsil 45. Spleen (HE) 1. Spleen (T & B cell immunohistochemistry)	
	CV system Digestive system 1 /Oral cavity	83. Heart: <i>Purkinje fibres, AV node, fibrous skeleton</i> (Masson's trichrome) 23. Heart: <i>SA node</i> (Masson's trichrome) 92. Lip (HE) 34. Tongue: <i>filiform & fungiform papillae</i> (HE) 50. Tongue: <i>foliate papillae</i> (HE) 49. Tongue: <i>circumvallate papillae</i> (HE)	
Week 4. Febr. 20-24.	Digestive system 2 /Oral cavity	54. Ground tooth (unstained slice specimen) 55. Developing tooth (AZAN) 52. Submandibular gland (HE) 9. Sublingual gland (HE) 51. Parotid gland (HE)	
Week 5. Febr. 27-March 3.	Respiratory tract	56. Epiglottis (HE) 17. Larynx (HE) 57. Trachea (HE)	58. Lung (HE) 60. Lung (TB) 61. Fetal lung (HE)
Week 6. March 6-10.	Digestive system 3	5. Esophagus (HE) 63. Gastro-esophageal junction (cardia, HE) 62. Stomach: <i>fundus</i> (HE) 64. Stomach: <i>pylorus</i> (gastroduodenal junction, HE) 65. Duodenum (HE) 66. Duodenum (picrosirius)	
Week 7. March 13-17.	Digestive system 4	99. Ileum (HE) 68. Colon (HE) 69. Vermiform appendix (HE)	
Week 8. March 20-24.	Digestive system 5	71. Liver (HE) 72. Liver (trichrome) 73. Liver (AgNO ₃ impregnation) 3. Biliary vesicle (HE) 70. Pancreas (HE)	
Week 9. March 27-31.	Midterm 2: cardiovascular system, lymphatic organs, digestive and respiratory tracts		
Week 10. April 3-7.	Urinary tract	74. Kidney (HE) 76. Kidney (TB) 77. Ureter (HE) 8. Urinary bladder (HE)	
April 10-14 Easter break			
Week 11. April 17-21.	Male genital system 1	78. Testicle (HE) 115. Epididymis (HE) 90. Spermatic cord (trichrome)	
Week 12. April 24-28.	Male genital system 2	89. Seminal vesicle (HE) 81. Prostate (HE) 7. Penis (Verhoeff's stain)	
Week 13. May 2-5	Female genital system	82. Ovary (HE) 97. Corpus luteum (HE) 94. Uterine tube (HE)	84. Uterus proliferation stage (HE) 95. Uterus secretional stage (HE) 87. Vagina (HE)
Week 14. May 8-12	REVISION		

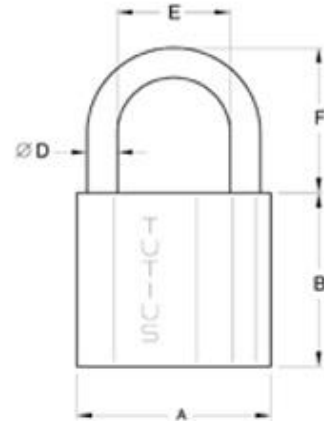
RECOMMENDED BOOKS



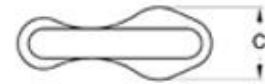
During dissection classes keep your belongings in the lockers and lock them with your padlock!

PADLOCK SIZE: 6 mm

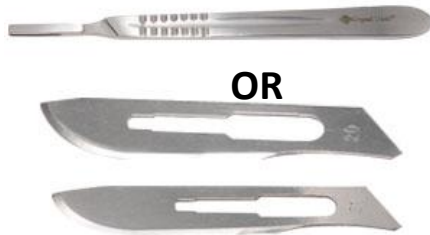
Please, remember to keep your valuables always on you, or lock them in the lockers since the department takes no responsibility for lost items.



DISSECTION ROOM TOOLS



SCALPEL



OR



A PAIR OF ANATOMICAL FORCEPS

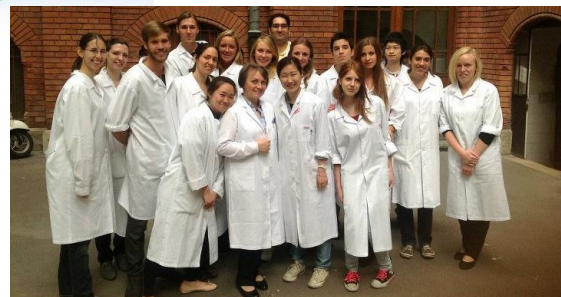


RUBBER GLOVES



PROTECTIVE CLOTHING (LABCOAT)

GOGGLES



TOPICS OF THE SEMIFINAL EXAM

Academic year 2016/2017

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
Esophagus (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 vili

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

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, topography, vessels, nerves)
Surface projection of pleura and lung
Microscopic structure and development of the lung

BODY CAVITIES

Thoracic wall
Pleura, pleural cavity
Mediastinum (divisions and content)
Diaphragm
Abdominal cavity (divisions and surface projections)
Abdominal wall (muscles, fasciae)
Rectus sheath
Hernia sites
Development and separation of body cavities
Development of the diaphragm
Development of the peritoneum

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