

**Semmelweis University**  
**Department of Anatomy, Histology and Embryology**  
**2019/2020**

**Faculty of Medicine**  
**1st year**

# **ANATOMY HANDBOOK**



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Assistant Professor  
Course Director

Dr. Ágoston Szél  
Full Professor  
Head of Department



# Anatomy, Histology and Embryology for EM students

## TEACHING DEPARTMENT:

SEMMELWEIS UNIVERSITY

Department of Anatomy, Histology and Embryology

Budapest, Tűzoltó utca 58.

H-1094 Budapest

<http://semmelweis.hu/anatomia>

## 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 practical sessions in the dissecting room:** Based on the weekly programs (see separate), students will both observe prosected cadaver specimens (bones, joints, muscles, viscera, brain) and perform dissections on parts of, or on an entire, embalmed cadaver. Students are supervised by the lab instructors. Bones, joints, muscles and peripheral nervous system will be primarily taught in the dissecting room.

**LECTURES:** First semester: 1x 45 min; second semester: 2x 45 min.

**PRACTICAL CLASSES:** First semester: 6x 45 min; second semester: 7x 45 min.

**ECTS CREDITS:** Altogether 16 (first semester: 7; second semester: 9).

**MIDTERM TESTS:** Oral and/or written

## ACCEPTANCE OF THE SEMESTER:

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

## TYPE OF EXAMS: oral and written

First semester: semifinal examination, second semester: final exam

### **Semifinal and final examinations consist of written and oral (practical and theoretical) parts**

1. Written pretest (e-learning module – access to SeKA account is obligatory)
2. Macroscopic Anatomy (identification of structures on true anatomical specimens) including relevant theoretical questions

## COURSE DESCRIPTION

### **Macroscopic Anatomy I.**

#### **Lectures and dissection classes**

**Subject matter :** Macroscopy and clinically oriented anatomy of the parts of the musculoskeletal system, i.e. osteology, arthrology and myology, together with the vascular and nervous supply of the limbs and the trunk. Skull. Cavities, muscles and internal organs of the Head & Neck region.

**Credits: 7**

**Prerequisite:** none

**Faculty of Medicine**  
**Academic Year 2019/2020, 1st Semester EM I. 1 – 6, 13-14, 16**

| Week   | Lectures<br><i>Wednesdays 13.00-13.45</i>  | Dissection room classes<br><i>Tuesdays 8.00, Wednesdays 14.00 for EM 1-6, 14.30 for EM 13, 14, 16,<br/>Fridays 10.00</i>   |
|--|--|--|
| Week 1<br>Sept 9-13  | 1. The role of anatomy in the medical curriculum.<br>Terminology (Prof. Szél)  | General introduction to practical work in the dissection room, tools and rules<br>Upper limb<br>Bones  |
| Week 2.<br>Sep 16-20   | 3. General arthrology and myology. Joints , muscles and movements of the shoulder and the upper girdle (Dr. Minkó)                           | Upper limb<br>Bones and joints   |
| Week 3.<br>Sept 23-27  | 3. Muscles and actions of the elbow joint (Prof. Kiss)   | Upper limb<br>Dissection of the muscles, vessels and nerves  |
| Week 4.<br>Sept 30 - Oct 4   | 4. Joints, muscles and actions of the wrist and the hand (Dr. Dóra)  | Upper limb<br>Dissection of the muscles, vessels and nerves  |
| Week 5.<br>Oct 7-11  | 5. Bones, joints, construction of the pelvis. Muscles and actions of the hip joint (Dr. Nagy)  | Lower limb<br>Bones and joints<br>Dissection of joints of the lower limb   |
| Week 6.<br>Oct 14-18   | 6. Muscles and actions of the knee joint<br>Muscles and joints of the foot. Architecture of the foot (Prof. Wenger)                          | Lower limb<br>Dissection of the muscles, vessels and nerves<br>Cadaver and free limb dissection  |
| Week 7.<br>Oct 21-25<br><i>October 23 is a national holiday</i>      | 7. – <i>National holiday</i>   | Lower limb and pelvis<br>Dissection of the muscles, vessels and nerves<br>Cadaver and free limb dissection<br><b>NO CLASS ON WEDNESDAY</b><br><b>1. Midterm test (oral):</b><br><b>Upper and lower limbs including the girdles.</b>                      |
| Week 8.<br>Oct 28 – Nov 1<br><i>November 1 is a national holiday</i> | 8. Ribs, components and movements of the thorax.<br>Diaphragm. (Prof. Szél)  | Dissection of the limbs and superficial regions of the the trunk (cadaver).<br>Demonstration of the components of the body wall on prosected specimens<br><b>NO CLASS ON FRIDAY</b>  |
| Week 9.<br>Nov 4-8   | 9. Components of the abdominal wall. Rectus sheath. Subinguinal hiatus. Inguinal canal. Adductor and femoral canals. (Prof. Szél)            | Dissection of the limbs and superficial regions of the the trunk (cadaver).<br>Demonstration of the components of the body wall on prosected specimens   |
| Week 10.<br>Nov 11-15  | 10. Components, muscles, joints and ligaments of the vertebral column. Intervertebral, atlantooccipital and atlantoaxial joints (Dr. Kocsis) | Dissection of the limbs and superficial regions of the the trunk (cadaver).<br>Demonstration of the components of the body wall on prosected specimens   |
| Week 11.<br>Nov 18-22  | 11. Bony framework of the skull. Sphenoid and ethmoid. Temporal bone. Cavities and spaces of the viscerocranium. (Dr. Csáki)                 | Bones of the skull<br>Internal and external skull bases<br>Bones of the facial skeleton, mandible. Orbit, nasal cavity, pterygopalatine fossa<br>Head and neck specimens<br>Muscles, fasciae and movements of the neck.                                  |
| Week 12.<br>Nov 25-29  | 12. Temporomandibular joint, muscles of mastication; muscles of facial expression. Muscles, fasciae and movements of the neck. (Dr. Nagy)    | Head and neck specimens<br>Topography of the superficial regions<br>Temporomandibular joint<br>Muscles of mastication and facial expression<br><b>2. Midterm test (e-learning type)</b><br>Bones, joints, muscles and fasciae of the trunk and head&neck |
| Week 13.<br>Dec 2-6  | 13. Composition and part of the oral cavity, palate, faucial isthmus and pharynx (Dr. Molnár)  | Dissection of superficial regions of the head and neck. Demonstration of the cavities on prosected specimen  |
| Week 14.<br>Dec 9-13   | 14. Nasal cavity, paranasal sinuses, larynx (Dr. Nemeskéri)  | Dissection of superficial regions of the head and neck. Demonstration of the cavities on prosected specimen  |

**Faculty of Medicine**  
**Academic Year 2019/2020, 1st Semester EM I. 7 – 12, 15, 17, 18, 19**

| Week   | Lectures<br><i>Mondays 11.00-11.45</i>   | Dissection room classes<br><i>EM 7-12: Mondays 12.00, Tuesdays 10.00, Thursdays 11.00<br/>EM 15-17: Tuesdays 8.00, Wednesdays 14.30, Fridays 10.00<br/>EM 18-19: Mondays 16.20, Tuesdays 16.30, Thursdays 17.00</i>                                      |
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| Week 1<br>Sept 9-13  | 1. The role of anatomy in the medical curriculum. Terminology (Prof. Szél)   | General introduction to practical work in the dissection room, tools and rules<br>Upper limb<br>Bones  |
| Week 2.<br>Sep 16-20   | 3. General arthrology and myology. Joints, muscles and movements of the shoulder and the upper girdle (Dr. Minkó)                            | Upper limb<br>Bones and joints   |
| Week 3.<br>Sept 23-27  | 3. Muscles and actions of the elbow joint (Prof. Kiss)   | Upper limb<br>Dissection of the muscles, vessels and nerves  |
| Week 4.<br>Sept 30 - Oct 4   | 4. Joints, muscles and actions of the wrist and the hand (Dr. Dóra)  | Upper limb<br>Dissection of the muscles, vessels and nerves  |
| Week 5.<br>Oct 7-11  | 5. Bones, joints, construction of the pelvis. Muscles and actions of the hip joint (Dr. Nagy)  | Lower limb<br>Bones and joints<br>Dissection of joints of the lower limb   |
| Week 6.<br>Oct 14-18   | 6. Muscles and actions of the knee joint (Prof. Wenger)  | Lower limb<br>Dissection of the muscles, vessels and nerves<br>Cadaver and free limb dissection  |
| Week 7.<br>Oct 21-25<br><b>October 23 is a national holiday</b>      | 7. Muscles and joints of the foot. Architecture of the foot (Dr. Katz)   | Lower limb and pelvis<br>Dissection of the muscles, vessels and nerves<br>Cadaver and free limb dissection<br><b>Grs 15-16: NO CLASS ON WEDNESDAY</b><br><b>1. Midterm test (oral):</b><br><b>Upper and lower limbs including the girdles.</b>           |
| Week 8.<br>Oct 28 – Nov 1<br><b>November 1 is a national holiday</b> | 8. Ribs, components and movements of the thorax. Diaphragm. (Prof. Szél)   | Dissection of the limbs and superficial regions of the the trunk (cadaver).<br>Demonstration of the components of the body wall on prosected specimens<br><b>Grs 15-16: NO CLASS ON FRIDAY</b>   |
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| Week 12.<br>Nov 25-29  | 12. Temporomandibular joint, muscles of mastication; muscles of facial expression. Muscles, fasciae and movements of the neck. (Dr. Nagy)    | Head and neck specimens<br>Topography of the superficial regions<br>Temporomandibular joint<br>Muscles of mastication and facial expression<br><b>2. Midterm test (e-learning type)</b><br>Bones, joints, muscles and fasciae of the trunk and head&neck |
| Week 13.<br>Dec 2-6  | 13. Composition and part of the oral cavity, palate, faucial isthmus and pharynx (Dr. Molnár)  | Dissection of superficial regions of the head and neck. Demonstration of the cavities on prosected specimen  |
| Week 14.<br>Dec 9-13   | 14. Nasal cavity, paranasal sinuses, larynx (Dr. Nemeskéri)  | Dissection of superficial regions of the head and neck. Demonstration of the cavities on prosected specimen  |

# Macroscopic Anatomy I.

## Subject matter of the 1<sup>st</sup> semester

Macroscopy and clinically oriented anatomy of the parts of the musculoskeletal system

- osteology
- arthrology
- myology
- vascular and nervous supply of the limbs and the trunk

Skull (viscerocranium, neurocranium).

Internal organs, cavities, muscles of the head & neck region.

### Test I. (oral, obligatory to attend)

Topics: Gross anatomy of the upper and lower limbs together with their girdles (bones, joints, muscles and fasciae)

Date: 7<sup>th</sup> week, October 21-25

### Test II. (written, obligatory to attend)

Topics: Bones, joints, muscles and fasciae of the trunk and head&neck

Date: 12<sup>th</sup> week, November 25-29.

### Semifinal examination

**Topics:** Subject matter of the semester

1) **Written 'e-learning type' pretest**

2) **Practical examination including theoretical questions** (oral examination)

Gross anatomy of the musculoskeletal system including the skull.

Internal organs of the head and neck region.

## EM I ANNOUNCEMENTS

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

**Semester acceptance (i.e. signature):** active participation in dissection room lab sessions (including mid-term tests) 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. Attendance is obligatory at the two mid-term tests. Students absent from the mid-term test should reattend at a given timepoint or their semester will not be accepted. Anatomy mid-terms may be oral or written exams. Oral exams, held in the dissection room, are composed of both identification of several structures on the specimen and theoretical questions related to the subject. The written mid-term test is organised as an e-learning type examination where a valid SeKa account (including a user name&password) is required.

**Cadaver preparation / dissection work** – every student is required to produce a fully dissected specimen during the 1st or the 2nd semester to prove excellence and to be exempted from the dissection part of the final examination. The specimen will be evaluated by a departmental jury.

**Semifinal examinations** are composed of the following parts:

1. written pretest,
2. oral examination composed of practical and theoretical questions in Macroscopy, i.e., identification and full description of the morphological features of the relevant body parts. Please note, that relevant theoretical questions may too arise during the practical examination part.

**Please note:** Examinations are usually held twice a week on Tuesdays and Thursdays starting at 1 pm. Students may register for, or deregister from, the examination via the Neptun system.

*In case neither the first nor the repeated takes of a semifinal exam have been successful the exam has to be postponed to the following exam period as a 'CV' exam (if there are possibilities left). Students may apply with the department to be exempted from passing the prerequisite.*

# RULES AND REGULATIONS IN THE DISSECTING ROOM

**IT IS STRICTLY FORBIDDEN TO eat, drink, to chew a gum, or to use music devices / phones.**

**Bags and coats should ALWAYS be left in the lockers PRIOR TO entering the dissecting room.**

**The lockers will have to be locked using your OWN padlocks.**

**Please, remember to keep your valuables always on you, or lock them in the lockers.**

**The department takes no responsibility for lost items.**

**Students are expected to be prepared for the practical work.**

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 should take care of the 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 strictly 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.

**Photos of the black board drawings can only be made with the agreement of the lab instructor.**

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 (with the exception of special workdays appearing in the schedule). 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**

## LIST OF TEXTBOOKS

**Sobotta Atlas of Human Anatomy** (Package), 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.

**Fitzgerald's Clinical Neuroanatomy and Neuroscience**, 7th Edition, Elsevier, 2015.

### Recommended textbooks

**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.

**KL Moore–AF Dalley: Clinically Oriented Anatomy**. 4th ed. Lippincott William and Wilkins, 1999.

**RMH McMinn: Last's Anatomy, Regional and Applied**. Churchill Livingstone, Edinburgh 1990. ISBN 0-443-03484-4

**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: 9780702030864

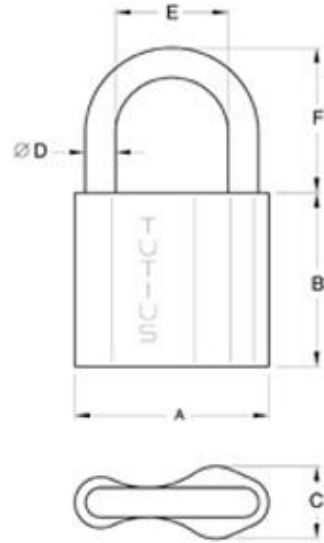
**Functional Anatomy Anatomy, Histology and Embryology for medical and dental students** by M. Réthelyi and J. Szentágothai, Medicina, 2018.



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

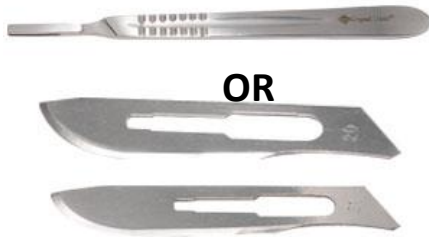
**PADLOCK SIZE: 6 mm**

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



### A PAIR OF ANATOMICAL FORCEPS

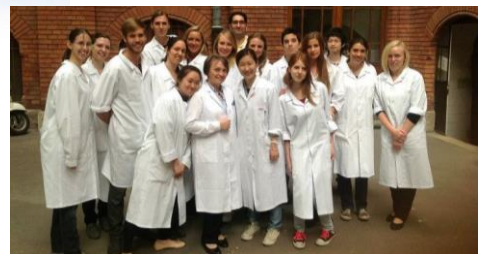


### RUBBER GLOVES



### PROTECTIVE CLOTHING (LABCOAT)

### GOGGLES



# TOPICS OF THE SEMIFINAL EXAMINATION

## MACROSCOPIC ANATOMY I.

### ***Musculoskeletal Anatomy***

General osteology, classification of bones

Bones, spaces and connections of the skull, external and internal skull bases

Neurocranium, components and cavities (anterior, middle and posterior cranial fossae)

Viscerocranium, components and cavities (walls and connections of the nasal cavity, orbit, oral cavity, pterygopalatine and infratemporal fossae)

Bones of the axial and appendicular skeleton

Vertebrae, ribs, sternum

Bones of the girdles and limbs

General arthrology

Fibrous and cartilaginous joints

Components of the synovial joints

Classification of synovial joints; movements and mechanisms

Structure of the vertebral column, the gross anatomy of the muscles acting upon it

Movements and muscles of the head&neck (atlantooccipital and atlantoaxial joints)

Joints of the shoulder girdle, the gross anatomy of the muscles acting upon them

Shoulder joint, the gross anatomy of the muscles acting upon it

Elbow joint, the gross anatomy of the muscles acting upon it

Structure and movements of the radiocarpal joint, gross anatomy of the muscles acting upon it

Metacarpophalangeal and interphalangeal joints, the gross anatomy of the muscles concerned with the movements

Carpometacarpal, metacarpophalangeal and interphalangeal joints of the thumb, the gross anatomy of the muscles concerned with the movements

Hip joint and the gross anatomy of the muscles concerned with the movements

Knee joint and the gross anatomy of the muscles concerned with the movements

Ankle joint together with the gross anatomy of the muscles acting upon it

Subtalar and talocalcaneonavicular joints, the muscles acting upon them

Temporomandibular joint and the gross anatomy of the muscles acting on it

Architecture and classification of bones

Structure and actions of somatic muscles

Osteofibrous structure of the thoracic cage (bones, joints, ligaments, movements)

Muscles and movements of the thorax

Muscles of the back and nape (occipital region)

Axilla, the quadrangular and triangular spaces

Cubital fossa

Muscles and cross section of the arm

Muscles and cross section of the forearm

Osteofibrous spaces and muscle compartments of the hand, tendinous sheaths

Muscles and spaces of the abdominal wall, rectus sheath

Composition of the pelvis (bones, ligaments and membranes)

Inguinal canal, femoral canal

Subinguinal hiatus, vascular and muscular compartments; adductor canal, femoral canal

Muscles of the buttock, the posterior abdominal wall and the pelvis (external and internal muscles of the hip)

Osteofibrous compartments, muscles and cross section of the thigh  
Popliteal fossa  
Osteofibrous compartments, muscles and the cross section of the leg  
Structure of the foot, arches of the foot  
Osteofibrous compartments of the foot, tendinous sheaths  
Muscles of mastication  
Muscles of facial expression  
Superficial muscles of the neck, muscle triangles  
Deep muscles of the neck and the laminae of the cervical fascia

### ***Vessels and nerves***

Dorsal branches of the spinal nerves, intercostal nerves  
Cervical plexus, brachial plexus, lumbar plexus, sacral plexus.  
Innervation of limbs  
Innervation of the trunk  
Cutaneous innervation  
Axillary artery and branches  
Arteries and veins of the arm, forearm, and hand  
Arteries and veins of the lower limb

### ***Lymphatic drainage***

Lymph nodes and vessels of the limbs  
Lymphatic drainage of the thoracic wall including the mamma  
Lymph nodes and lymphatic vessels of the head&neck

### ***Internal organs of the head & neck region***

Subclavian artery and its branches  
Common and external carotid arteries and their branches  
Maxillary artery and its branches  
Veins of face and neck  
Oral cavity (divisions, boundaries)  
Floor of mouth, sulcus lateralis linguae  
Types and morphology of teeth  
Blood supply and innervation of teeth  
Tonsils (anatomy)  
Faucial isthmus, palate  
Macroscopy of the tongue  
Salivary glands together with topography  
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, vessels, nerves)  
Skeleton and joints of larynx  
Laryngeal ligaments (fibroelastic membranes, mucous membrane)  
Muscles of larynx, innervation