

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

Faculty of Medicine
1st year

MACROSCOPIC ANATOMY AND EMBRYOLOGY I HANDBOOK



Dr. Andrea D. Székely
Associate Professor
Course Director

Dr. Alán Alpár
Full Professor
Head of Department



Macroscopic Anatomy and Embryology I

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 of Human Anatomy (thorax, pelvis, hand, foot, skull, heart, chapters of the visceral organs, central nervous system, organs of special senses, topographical anatomy) together with relevant chapters of Human development.

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: 2x 45 min; second semester: 3x 45 min.

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

ECTS CREDITS: Altogether 17 (first semester: 8; second semester: 9).

MIDTERM TESTS: Oral

ACCEPTENCE OF THE SEMESTER:

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

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/embryological questions

COURSE DESCRIPTION

Macroscopic Anatomy and Embryology 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 of the Head & Neck region. General Embryology and the development of the locomotor system.

Credits: 8

Prerequisite: none

Macroscopic Anatomy and Embryology I.

Faculty of Medicine EM 1-22

Academic Year 2024/2025 1st semester

Weeks	Lectures <i>EM 1-11 Tuesday 10.00-11.45 Huzella lecture room</i> <i>EM 12-22 Tuesday 8.00 - 9.45 Lenhossék lecture room</i>	Lecturer 1-11	Lecturer 12-22	Dissection classes (90 minutes) <i>EM 1-6 Tue 8.00, Wed 10.00, Thu 16.15</i> <i>EM 7-11 Mon 14.00, Tue 15.00, Thu 8.00</i> <i>EM 12-17 Mon 8.00, Wed 8.00, Fri 11.45</i> <i>EM 18-22 Mon 10.15, Tues 10.00, Fri 9.45</i>
Week 1 09. 2-6.	1. General introduction, terminology. General arthrology and myology 2. Diagnostic aspects of the locomotor system	1 Székely 2	1 Székely 2	General introduction to practical work in the dissection room, tools and rules Upper limb, bones
Week 2 09. 9-13.	3. Joints and movements of the shoulder and shoulder girdle 4. Clinical anatomy of the shoulder and the shoulder girdle	3 Alpár 4	3 Alpár 4	Upper limb Bones and joints. Dissection of the muscles, vessels and nerves
Week 3 09. 16-20.	5. Joints and movements of the elbow and the hand 6. Clinical anatomy of the elbow and hand	5 Kocsis 6	5 Kocsis 6	Upper limb Bones and joints. Dissection of the muscles, vessels and nerves
Week 4 09. 23 - 27.	7. Pelvis. Joints and movements of the hip 8. Clinical anatomy of the hip joint	7 Csáki 8	7 Csáki 8	Upper limb Dissection of the muscles, vessels and nerves
Week 5 09.30 – 10.4.	9. Joints and movements of the knee 10. Clinical anatomy of the knee	9 Alpár 10	9 Alpár 10	Lower limb, bones and joints Dissection of joints of the lower limb
Week 6 10. 7-11.	11. Joints and movements of the foot 12. Clinical anatomy of the foot	11 Rácz 12	11 Rácz 12	Lower limb Dissection of the muscles, vessels and nerves Cadaver and free limb dissection
Week 7 10. 14-18.	13. Components and movements of the vertebral column 14. Clinical anatomy of the vertebral column	13 Zsíros 14	13 Zsíros 14	Lower limb and pelvis Dissection of the muscles, vessels and nerves Cadaver and free limb dissection 1. Midterm test (oral): Upper and lower limbs including the girdles.
Week 8 10. 21-25. <i>Oct.23. is a National Holiday</i>	15. Composition of thorax, diaphragm 16. Composition of the abdominal wall. Hernia canals. Inguinal and femoral canals	15 Katz 16	15 Katz 16	Dissection of the superficial regions of the trunk (cadaver). Demonstration of the components of the body wall on prosected specimens No dissection class on Wednesday (Oct 23) for groups EM 1-6 and 12-17
Week 9 10. 28. - 11. 1. <i>Nov. 1 is a National Holiday</i>	17. General composition of the skull. 18. Clinical/radiological anatomy of the cranial spaces	17 Ádám 18	17 Ádám 18	Dissection of the superficial regions of the trunk (cadaver). Demonstration of the components of the body wall on prosected specimens No dissection class on Friday (Nov.1.) for groups EM 12-17 and 18-22)
Week 10 11. 4-18	19. <i>General introduction to embryology. Intrauterine development. Gametes.</i> 20. <i>Fertilization, cleavage, preimplantation development of the embryo.</i>	19 Székely 20 Minkó	19 Székely 20 Minkó	Dissection of the trunk (cadaver). Demonstration of the components of the body wall on prosected specimens Bones of the skull. Internal and external skull bases
Week 11 11. 11-15.	21. <i>Implantation, structure of the placenta, placental circulation. Fetal membranes, yolk sac. Bilaminar embryo.</i> 22. <i>Gastrulation, formation and derivatives of germinal layers. Differentiation of mesoderm.</i>	21 Nagy 22 Vereczki	21 Nagy 22 Vereczki	Internal and external skull bases Bones of the facial skeleton, mandible. Orbit, nasal cavity, pterygopalatine fossa Head and neck specimens Muscles, fasciae and movements of the neck.
Week 12 11. 18-22.	23. <i>Neurulation, neural crest.</i> 24. <i>Development of somites, early development of the cardiovascular system.</i>	23 Dóra 24 Barna	23 Dóra 24 Barna	Head and neck specimens Topography of the superficial regions Temporomandibular joint Muscles of mastication and facial expression 2. Midterm test (oral) Bones, joints, muscles and fasciae of the trunk and neck
Week 13 11. 25 - 11.29	25. <i>Folding of the embryo. Body axes, cranio-caudal and dorsoventral differentiation.</i> 26. <i>Development of the musculoskeletal system – derivatives of pharyngeal arches, development of the limbs.</i>	25 Kozsurek 26 Nagy	25 Kozsurek 26 Nagy	Embryology consultations Revision Cadaver dissection Demonstration of the cavities on prosected specimen
Week 14 12. 2-6.	27. <i>Development of the skull</i> 28. <i>Placenta, umbilical cord, embryologic and fetal periods, parturition</i>	27 Nagy 28 Hanics	27 Nagy 28 Hanics	Embryology consultations Revision, cadaver dissection Demonstration of the cavities on prosected specimen

EM I. Macroscopic Anatomy and Embryology I.

SUBJECT MATTER OF THE SEMESTER

Macroscopy and clinically oriented anatomy of the musculoskeletal system

- osteology
- arthrology
- myology
- vascular and nervous supply of the limbs and the trunk
- muscles, fasciae, vessels and nerves of the head&neck region

Skull (viscerocranium, neurocranium).

General Embryology

Development of the skull, trunk and limbs

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 (including the two midterms) or their semester is not accepted.

Absences are limited in 25%.

Attendance at practical classes is obligatory

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

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

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

MIDTERM EXAMINATIONS

During the semester, both practical and theoretical knowledge will regularly be evaluated. Attendance (but not a successful passing of the midterm) is obligatory at the two mid-term tests. Students absent from the mid-term tests should reattend at a given timepoint or their semester will not be accepted.

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

Test I. (oral, obligatory to attend)

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

Date: 7th week (3rd class)

Test II. (oral, obligatory to attend)

Topics: Bones, joints, muscles and fasciae of the trunk, vertebral column, body wall

Neck muscles, cervical fasciae

Bones, spaces and connections of the skull, temporomandibular joint, muscles of mastication, muscles of facial expression

Date: 12th week (3rd class)

***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 during Week 13.*

SEMIFINAL EXAMINATION

1st part - **Written** 'e-learning type' pretest (*Macroscopical Anatomy and Embryology questions*)

2nd part - **Practical** (oral) examination including theoretical questions

Gross anatomy of the musculoskeletal system including the skull together with embryological relevances. Identification and full description of the morphological features of body parts including theoretical/developmental relevances.

Topics: Subject matter of the semester

Exemptions - if the average of the two midterm marks is at least 4.00, an exemption is offered from the **oral (dissection) part of the semifinal examination** with the following marks:

good (4) - if the midterm results are 4+4 or 3+5;

excellent (5) - if the midterm results are 4+5 or 5+5.

These students only need to take the written part of the semifinal examination.

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

*Students having no, or an unsuccessful, semifinal examination may postpone the semifinal examination to the summer exam period as a **CV exam** in case they have exam possibilities left.*

*In case they want to continue to the 2nd semester they have to submit a request for a **course registration „without passing the prerequisite”**, but in this case **ONE OF THE MIDTERM MARKS will have to be better than a fail (at least a 2)**. Students with two fails from the midterms are not eligible to apply and will have to repeat the year.*



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, 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 to protect one's clothing from contacting the cadaver specimen. 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 from the lab instructor. Students can leave the sessions only with the approval of the lab instructor.

It is strictly prohibited to make recordings in the dissection room.

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.

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.

WORK / ENVIRONMENTAL PROTOCOL AND INFECTION CONTROL

GENERAL RULES

1. Frequently wash your hands using soap and warm water.
2. Sanitise your hand frequently.
3. Do not touch your face or eye.
4. It is **STRICTLY FORBIDDEN** to consume food, drinks or chewing gum **anywhere** on the premises of the department (including lecture halls, dissection rooms, histology laboratories or on the hallways, staircases).
5. Use paper tissues in case you cough or sneeze and dispose of them immediately in the designated bins.

SPECIFIC RULES CONCERNING THE HISTOLOGY LABORATORIES

1. You may clean the surfaces with hygienic towels before you start using them.
2. Food and drinks are **strictly forbidden** on the premises of the department.

SPECIFIC RULES CONCERNING THE DISSECTION ROOMS

1. Lab coats (buttoned up) must be worn in the dissecting room at all time.
2. Use hand sanitizers upon entering. Rubber gloves are provided for dissection.
3. Loose/long hair must be tied back before dissection.
4. Food and drinks are **strictly forbidden** on the premises of the department.
5. Only books, sketch, or notebooks, atlases and dissection tools (as well as ID, cards, phones etc) to be used during the dissection classes are allowed in the labs. All other items should be left in the lockers.
6. Have your own padlock on you to lock your stuff and/or clothes in the lockers
7. No valuable items should be left in the lockers, the department does not bear the responsibility for lost items/valuables.
8. Scalpels, blades and tweezers will have to be carried in a tightly closed and hard box. Please make sure that nobody is harmed when working with the sharp and pointed tools.
9. Accidents must be reported to the teacher first and wounds will be dressed with the help of the dissection room assistants.
10. Lab coats and rubber gloves are to be worn in the dissection room units only! Do not step out (not even for using the washroom) from the dissection unit while still wearing a lab coat.
11. It is strictly forbidden to take bones or other anatomical specimens or samples etc. from the dissecting room.
12. Dry and wet samples must be treated separately. Please wash the gloves during dissection before you start handling bones or dry /plastinated specimen.
13. There is a bell ringing 5 minutes before the end of the practical classes. Then all cadaver specimens will have to be properly wrapped and put away in their bags or boxes.
14. Dissection leftovers should be discarded in the special containers and the trays should be left clean and dry.
15. Dissection tools should be properly washed.
16. Disposable scalpels/blades could be disposed of in special yellow/red containers designed for sharps and hazardous material. Gloves must be discarded in labelled bins only, but NEVER in communal/paper waste!
17. The dissection unit may only be left following a thorough handwash using a disinfectant soap.
18. Please make sure that you leave the dissecting room quickly to provide time for the personnel to clean the surfaces between classes.

FIRE SAFETY PROTOCOL

Please make sure to adhere to the rules of fire safety regulation with full compliance, paying special attention to the following:

1. The use of naked light or smoking is **STRICTLY PROHIBITED** on the premises of the Department, including the building and the yard.
2. In case of fire, a loud fire alarm signal is to ring throughout the building. In case of a fire drill, the building must be left organized, with the guidance of the teacher/instructor of the group, using the exits as quick as possible. Escape routes are illustrated on every floor.
3. The use of elevators is **STRICTLY PROHIBITED** during a fire drill.
4. Every lecture room has 3 accessible entrances/exits. Students usually enter and leave through the lower single entrance under normal circumstances. When necessary, i.e. in case of fire, the upper 2 doors could also be opened using the keys kept in the fire cassettes next to the doors.
5. All fire cases or signs/ suspicion of a possible fire should be reported to the teacher of the group.
6. No electrical devices should be plugged in a connector different from the designated ones. Only electrical devices in an intact and perfect condition should be used.

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

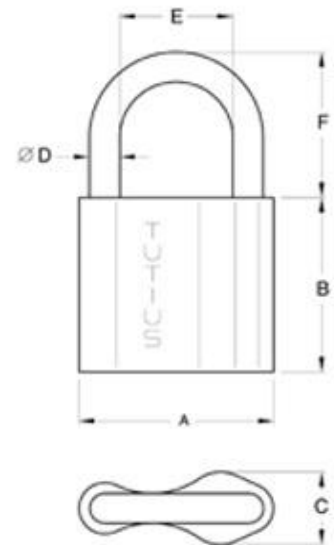
- Gray's Anatomy. The Anatomical Basis of Clinical Practice**; 41st edition by S. Standring: 2015
ISBN : 9780702052309
- Netter's Clinical Anatomy with Online Access, 3rd Edition**, by J. Hansen, 2014, **eBook ISBN:** 9781455770632 **eBook ISBN:** 9780323312899 014
- Anatomy, A Photographic Atlas**, 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 since the department takes no responsibility for lost items.



DISSECTION ROOM TOOLS

SCALPEL



OR



A PAIR OF ANATOMICAL FORCEPS

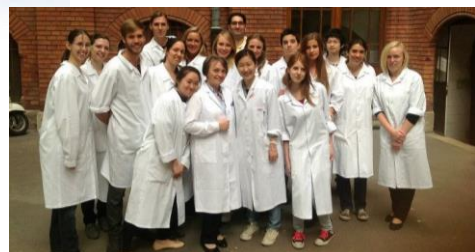


RUBBER GLOVES



PROTECTIVE CLOTHING (LABCOAT)

GOGGLES



ANNOUNCEMENTS CONCERNING THE SEMIFINAL EXAMINATIONS
in
MACROSCOPIC ANATOMY AND EMBRYOLOGY I. (new curriculum)

Semifinal examinations are generally held on Tuesdays and Thursdays starting at 12.00 in the Histology Laboratories then continue with the dissection part in one of the two lecture halls

REGISTRATION ISSUES

Registration has to be done in neptun according to the Study and Examination Policy. Registration closes 24/23 hours before the actual examination time.

Absences – no-show at the semifinal examination reduces the remaining examination possibilities and Students will have to pay a missed examination fee via neptun.

In case of health problems, students will have to present a **doctor's note within 3 working days** to be evaluated by the Head of Department. If accepted, the number of the student's examination possibilities will not be reduced.

On the day of the examination, leave your bags in a locker and gather in front of the Histology lab 10 minutes before starting time. Please make sure you have the following items on you:

ID card/student card (you may not start the examination without it)
SeKA login details (memorize or write them down on a small piece of paper) *
a pair of anatomical forceps for the Macroscopy part
in case of a retake exam – proof of payment (except for the 1st retake)

*Students who cannot login /forgot their password will be considered as „absent“ (see above) and have to sit for the examination on a different day

Phones and smart watches have to be stored elsewhere during examinations. Neither pens+papers may be with you during the written part. You cannot take notes or talk to your peers during the examination. Students found to use such items or breaking the aforementioned rules will be immediately suspended, the case recorded and the examination is terminated with a fail (1).

For safety reasons you may keep your valuables (money, cards, IDs, etc) on you, however „large“ items, such as phones (switched off), tablets (switched off) and pencil cases will be collected upon entering the examination room.

No chewing gum, no food, no drinks are allowed while on the premises

PARTS OF THE SEMIFINAL EXAMINATION

WRITTEN PART – Histology laboratory (Students may not leave the room during the test)

The test is composed of 40 simple / multiple choice questions including Embryology (20%)

Writing time: 40 minutes

Passing rate: 60% (0-23.99 points=fail, 24-27.99=satisfactory, 28-31.99=average, 32-35.99=good, 36-40=excellent)

- Following the completion of the test Students may view their results, however, neither questions may be asked nor notes may be taken during this time. Students may not leave the room before the inspection time expires.
- Students not reaching 60% percent in the written part cannot continue (i.e. fail) the examination and have to leave.

- Students failing the examination in a subsequent practical part may be exempted from the written test during the retake examination **ONLY** if they gained a good (4), or excellent (5), result from the written test. These students should present themselves at 13.00 on the day of the retake examination at the Lenhossék lecture room.
- Students may request in writing to sit for an oral theory exam to replace the written part in case of a 2nd or 3rd retake examination. A request will have to be sent to the Course Director 48 hours before the examination day.

MACROSCOPY PART

This part is held in the Lenhossék or Huzella Lecture Hall. Rubber gloves and labcoats are provided by the department.

Here the Students are examined on prosections in the following topics:

- Upper and lower limbs
- Trunk (thorax and abdomen including the inguinal canal)
- Head and neck (including the skull)

Further questions, other than the identification of the presented specimens, may arise, e.g. discussing theoretical or embryological relevances. Students may be asked to produce schematic drawings of certain regions as part of the examination.



MARKING SYSTEM

The examination finishes in the Lecture Hall, where Students are given a mark calculated from the all results.

- If one part of an examination results in fail (1), the entire examination is terminated with a fail (1).
- In case the result of one of the parts is **1/2**, the overall result of the examination CANNOT be better than a pass (2). This mark can only be earned once during the examination.
- **Students failing the examination, may repeat the exam once „free”, every further attempt will be charged for.** The total number of examination seats is set (200% of the number of students in a given course), therefore the number of examination seats will not be increased*.
- **Retake of a successful examination** - students unhappy with the result of the examination may apply in writing with the Course Director, to retry the examination. They will be registered by the Course Director in neptun.
Please note, that such a retake examination does not necessarily result in a better mark.
- Students may request in writing to sit for ***an oral theory exam to replace the written part*** in case of a 2nd or 3rd retake examination. A request will have to be sent to the Course Director 48 hours before the examination day.
- **Technical problems** concerning registration or deregistration via the neptun system are beyond the scope of the Department, Students should seek help from the neptun group of the Secretariat.
- The Registrar of the English Secretariat is not entitled to register or deregister students with the only exception of using the 4th chance upon getting the Dean's permission.
- ***Students may request an oral examination to replace the written theoretical part for the 2nd or 3rd retakes of the semifinal examination. The request will have to be submitted in writing with the Course Director 48 hours prior to the date of the examination. This request has to be resubmitted in case students would like to ask for a further occasion.***

TOPICS OF THE SEMIFINAL EXAMINATION

Macroscopic Anatomy And Embryology I.

Musculoskeletal Anatomy

General osteology, classification of bones

Continuous connections of bones. Classification of joints; components, movements and mechanisms

General myology

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

Axillary fossa, quadrangular and triangular spaces

Muscle compartments and cross section of the arm

Elbow joint, the gross anatomy of the muscles acting upon it. Cubital fossa

Muscles and cross section of the forearm

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

Osteofibrous spaces and muscle compartments of the hand, tendinous sheaths

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

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

Thoracic muscles

Diaphragm

Muscles and spaces of the abdominal wall, rectus sheath

Composition of the pelvis (bones, ligaments and membranes)

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

Inguinal canal, femoral canal

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

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

Osteofibrous compartments, muscles and cross section of the thigh

Knee joint and the gross anatomy of the muscles concerned with the movements. Popliteal fossa

Osteofibrous compartments, muscles and the cross section of the leg

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

Subtalar and talocalcaneonavicular joints, the muscles acting upon them

Osteofibrous compartments and structure of the foot, arches of the foot

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)

Temporomandibular joint and the gross anatomy of the muscles of mastication

Superficial muscles of the neck, muscle triangles

Deep muscles of the neck and the laminae of the cervical fascia

Muscles of facial expression

Further topics with relevance to the musculoskeletal system

Lymphatic drainage of the thoracic wall including the mamma

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
Lymph nodes and lymphatic drainage of the upper and lower limbs

General Embryology and development of the musculoskeletal system

Spermatogenesis, spermiogenesis

Oogenesis

Fertilization, cleavage of the zygote

Blastocyst formation; the bilaminar embryonic disc

Implantation

Formation of body axes, parts of the early embryo (yolk sac, amnion, chorion, body stalk)

Gastrulation

Formation of the intraembryonic mesoderm; the notochord

Neurulation (neural tube and neural crest)

Derivatives of ectoderm, endoderm and mesoderm

Folding of the embryo

The structure and function of the placenta

Development of the fetal membranes (chorion and amnion), umbilical cord

Twin formation

Membranous and cartilaginous neurocranium and viscerocranium

Development of the limbs and vertebral column

Development of the muscular system

