REQUIREMENTS

Semmelweis University, Faculty of Dentistry

Name(s) of the Institute(s) teaching the subject:
Department of Anatomy, Histology and Embryology

Name of subject: Makroszkópos Anatómia és fejlődéstan II.

in English: Macroscopic anatomy and embryology II.

in German: Makroskopische Anatomie und Embryologie II.

Credits: 8

Total number of hours: 112 lectures: 42 practices: 70 seminars: 0

Type of subject: compulsory course elective course optional course

Academic year: 2021/2022.

Subject code[2]: FOKOANT223_2A **(NEW CODE)**

Name of the Course Leader: Dr. Gerber Gábor

Contact details: Semmelweis University, Department of Anatomy, Histology and Embryology,

Budapest 1094 Tűzoltó utca 58. +36-20-428-6143
Position: Associate Professor, Dr. Habil.

Learning objectives, the role of Macroscopic Anatomy in the medical curriculum:
Demonstration of the macroscopical composition of the human body specifically to provide the future doctors of dental medicine with a valid body of information with relevance to clinically significant morphological structures including the detailed description of the maxillofacial region.
General Embryology describes the intrautrine development of a human embryo/fetus and introduces the development of the locomotor system. Teaching is done in the form of lectures and dissection classes.

Place where the subject is taught (address of the auditorium, seminar room, etc.):
Semmelweis University, Department of Anatomy, Histology and Embryology
Budapest 1094, Tűzoltó utca 58.

Successful completion of the subject results in the acquisition of the following competencies:
Understanding the macroscopical composition of the human body together with the position and topographical relation of organs. Clear understanding of structure and function. Ability to perform basic preparatory tasks during dissection. Identification of general directions/landmarks on the cadaver together with the recognition of significant organs/body parts. Acquiring knowledge of surface features and/or sectional anatomy forming basis for clinical diagnostics (palpation, auscultation, etc.) and radiology/imaging methods. Clear understanding of the processes of human development starting from fertilization (general embryology) together with the development of the musculoskeletal system

Course prerequisite(s):
Macroscopic Anatomy I. (successful semifinal examination)

Number of students required for the course (minimum, maximum) and method of selecting students):
obligatory for all registered students, on the basis of registration via the NEPTUN system

How to apply for the course:
Via the NEPTUN system.

Detailed curriculum:

List of lectures

1. Orbit, eye bulb. Extraocular muscles and eye movements. Oculomotor (CN3), trochlear (CN4) and abducent (CN6) nerves
2. Nasal cavity, paranasal sinuses
3. Composition of the oral cavity, palate, tongue and the faucial isthmus
4. Anatomy of teeth
5. Temporomandibular joint, muscles of mastication
6. Classification of cranial nerve nuclei
7. Autonomic nervous system. Sympathetic and parasympathetic nervous systems
8. Salivary glands
9. Vessels, lymph nodes and lymphatic drainage of the head&neck region.
10. Trigeminal nerve (CN 5). Cutaneous innervation
11. Morphology of the pharynx and esophagus
12. Anatomy of the larynx
13. *Development/derivatives of the foregut together with the pharyngeal clefts/arches/pouches*
14. Facial (CN 7) and hypoglossal (CN 12) nerves
15. Glossopharyngeal (CN 9), vagus (CN 10) and accessory (CN 11) nerves
16. Innervation of the teeth and the gingiva, the anatomy of dental local anaesthesia
17. Face development together with developmental malformations.
18. Imaging anatomy of the jaws, teeth and the maxillary sinus (Radiology lecture)
19. Chambers of the heart, external features, annuli fibrosis,valves. Vessels, conducting system of the heart. Surface projection of the heart, pericardium. Auscultation points.
20. Internal organs of the thoracic cavity. Divisions of the mediastinum. Lymphatic drainage.
21. Morphology of the trachea and the lung. Pleura.
22. Stomach and small intestines (duodenum, jejunum, ileum)
23. Large intestine, rectum
24. *Development of midgut and hindgut.*
25. *Development of the heart.* Fetal circulation
26. *Development of arteries and veins*
27. Liver, gall bladder, pancreas, spleen.
28. *Development of the lung. Circulatory adaptation in the newborn*
29. Large intestine, rectum

Peritoneum, peritoneal recesses, peritoneal relations of abdominal organs.

30. *Development of the peritoneum, Separation of body cavities*.
31. Histology of urinary organs
32. *Development of urinary organs*.
33. Morphology and coats of the testicle. Epididymis.
34. Morphology of the spermatic cord, seminal vesicle and prostate. Morphology of the penis and male urethra.
35. Anatomy of the ovary, Fallopian tube and uterus
36. Vagina, external genital organs. Female and male perineum.
37. *Dvelopment of genital organs*
38. Topographical and sectional anatomy of the head.
39. Topographical and sectional anatomy of the neck
40. Topographical and sectional anatomy of the thorax
41. Topographical and sectional anatomy of the abdomen
42. Topographical and sectional anatomy of the pelvis

Topics for the dissection classes

Weeks 1-6: Maxillofacial anatomy. Cadaver dissection. Morphology of the organs of the head and neck region. Anatomy of teeth. Dissection and inspection of cranial nerves.

Weeks 7-14: Cadaver dissection to reveal the internal organs. Opening of the thorax and the abdominal cavities, dissection/inspection of internal organs (heart, lungs, stomach, liver, pancreas,

bowels, great vessels). Inspection of peritoneal relations of internal organs. Retroperitoneal structures (morphology of the kidney and ureters). Anatomy of the male and female genital organs/perineum. Lymphatic organs/drainage of the abdomen and lesser pelvis.

Other subjects concerning the border issues of the given subject (both compulsory and optional courses). Possible curricular overlaps:
Microscopic Anatomy and Embryology I - II.

Special training activities required[4]:
All students are required to *demonstrate their knowledge and motivated practical work* by the completion and demonstration of a dissected specimen or region once during the two semesters of the Academic year.

Requirements for participation in classes and the possibility to make up for absences:
Active participation in practical lessons/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 cannot be made up for.

Methods to assess knowledge acquisition during term time[5]:
During the semester, both practical and theoretical knowledge will be evaluated in an obligatory *Maxillofacial* midterm test and a non-obligatory assessment. Attendance is obligatory at the midterm test. Students absent from the midterm test should reattend at a given timepoint or their semester will not be accepted. Successful midterms cannot be repeated neither can their marks be upgraded. Anatomy midterms may be oral or written (e-learning type) examinations.
The time and topic list of the midterm tests will be announced in the departmental homepage at the beginning of the semester (http://semmelweis.hu/anatomia).

Requirement for signature:
Active participation in 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. Students should successfully pass the obligatory midterm test or their semester is not accepted. Unsuccessful midterms may be repeated at two given timepoints during the last two weeks of the semester.

Type of examination:
Final (written and oral) examination, topics: subject matter of the subjects Macroscopic Anatomy and Embryology I-II. Final examinations consist of written and oral (practical and theoretical) parts
1. Written pretest (e-learning module)
2. Macroscopic Anatomy (identification of structures on true anatomical specimens) including relevent theoretical questions from the subject matter of the semester

Requirements of the examination[6]:
During the semifinal examination the knowledge of students will be tested. Semifinal examinations are composed of written and oral (practical and theoretical) parts.

Topic list for the final examination:

Macroscopic Anatomy and Embryology I.
(see there)

Macroscopic Anatomy and Embryology II.

Muscles of the neck, triangles of the neck, cervical fasciae
Orbit, accessory organs of the eye, extraocular muscles, eye movements.

Shape, external features of heart
Skeleton of heart, anuli fibrosi
Structure of heart wall
Chambers of heart
Endocardium, ostia, valves of heart
Pulse generating and conducting system of heart
Vessels of the heart

Pericardium
Position and surface projections of heart. Radiology of heart
Percussion and auscultation (area of cardiac dullness, heart sounds)
Pulmonary circulation
Parts and topography of the aorta
Arch of aorta together with its branches
Blood supply, venous and lymphatic drainage of the thoracic wall and mammary gland
Thoracic duct, right lympahtic trunk
Thoracic aorta and its branches
Abdominal aorta and its branches
Subclavian artery, axillary artery together with their branches
Celiac trunk and its branches
Superior mesenteric artery and its branches
Inferior mesenteric artery and its branches
External and internal iliac 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

Esophagus (anatomy)
Stomach (macroscopy and peritoneal relations)
Duodenum (macroscopy, shape, position, vessels)
Jejunum and ileum (macroscopy, shape, position, vessels)
Colon (macroscopy, shape, position, vessels)
Rectum, anal canal (macroscopy, shape, position, vessels)
Liver (macroscopy and peritoneal relations)
Gall bladder and biliary passages (anatomy)
Pancreas (macroscopy, shape, position, vessels)

Trachea and bronchial tree
Lung (macroscopy, shape, position, vessels)
Surface projection of pleura and lung
Pleura, pleural cavity
Mediastinum (divisions and content)
Kidney (macroscopy, shape, position, vessels)
Urinary passages (macroscopy of ureter and urinary bladder)
Macroscopy of the male and female urethrae
Testis (macroscopy, shape, position, vessels)
Epididymis, vas deferens, spermatic cord
Scrotum, coats of testis
Seminal vesicle, prostate
Macroscopy of penis
Ovary (macroscopy, shape, position, vessels)
Uterine tube (shape, position, vessels)
Uterus (shape, parts, position, supporting structures, vessels)
Broad ligament (lig. latum) and its components
Vagina, external female genital organs
Topography of the female pelvic organs (connective tissue spaces, peritoneal relations)
Topography of the male pelvic organs (connective tissue spaces, peritoneal relations)
Pelvic floor, perineum
Peritoneum, greater and lesser omentum, mesentery, omental bursa
Sympathetic nervous system (cervical and thoracic parts, sympathetic trunk)
Sympathetic nervous system (abdominal and pelvic parts)
Sacral parasympathetic system

Macroscopy questions in Maxillofacial Anatomy
Oral cavity (divisions, boundaries)
Frontal section of the oral cavity, sulcus lateralis linguae
Faucial isthmus, palate
Macroscopy of the tongue (parts, vessels, innervation)
Floor of mouth (descriptive anatomy)
Pharynx, muscles, para- and retropharyngeal spaces
Nasal cavity and paranasal sinuses
Larynx (skeleton, fibroelastic membranes joints and muscles)
Larynx (mucous membrane, cavity)
Types and morphology of teeth
Tooth eruption and exfolition
Blood supply and innervation of upper teeth
Blood supply and innervation of lower teeth
Temporomandibular joint
Muscles concerned with the opening ang closing of the mouth
Muscles of facial expressions
Muscles and mechanism of mastication
Anatomy of the parotid gland, parotid nest
Anatomy of the submandibular gland, submandibular region
Anatomy of the sublingual gland, sublingual region
Branches of the ophthalmic nerve (CN 5/1)
Branches of the maxillary nerve (CN 5/2)
Branches of the mandibular nerve (CN 5/3)
Branches of the facial nerve (CN 7)
Branches of the glossopharyngeal nerve (CN 9)
Branches of the vagus nerve (CN 10)
Branches of the accessory and hypoglossal nerves (CN 11 & 12)
Lymph nodes and lymphatic drainage of the head & neck region
External carotid artery and its branches
Maxillary artery and its branches
Course and braches of the internal carotid artery
Veins of face and neck
Cranial sympathetic and parasympathetic nervous systems
Cervical plexus

Maxillofacial Embryology
Tooth development together with their malformations
Development of the jaws
Development of the face
Developmental malformations of the face
Derivatives of pharyngeal grooves and pouches
Derivatives of pharyngeal arches
Development of the primary and secondary palates
Development of the tongue

Organ development
Fetal circulation
Formation of atria, development of the interatrial septum
Formation of ventricles, development of the aorticopulmonary septum
Development of arteries
Development of the inferior vena cava and the portal vein
Development of the superior vena cava, azygos and hemiazygos veins
Development and differentiation of the midgut

Development and differentiation of the hindgut
Formation of the liver and pancreas

Development of the lower airways including the lungs
Kidney development
Development of the urinary passages
Gonadal development
Development of the male genital tract
Development of the female genital tract
Development of the male/female external genitals
Development and divisioning of the body cavities
Development of the peritoneum

Type and method of grading[7]:
Semifinal examinations are composed of written theoretical and oral practical parts. The written theoretical examination is done using an e-learning module while the practical examination is conducted on real prosected cadaver specimen.
Examiners are delegated by the Subject director (Lecturer of the Course) with the consensus of the Head of Department.
Students will receive two separate marks to the two parts of the examination. In case of an unsuccessful (fail=1) examination part, the whole semifinal examination needs to be retaken. Those with a 4 (good) or 5 (excellent) written examination mark are exempted from rewriting the written pretest in the retake examination in case failing during the practical part of the given semifinal examination. The final mark is calculated on the basis of the results (marks) gathered during the written and oral parts of the given examination by the president of the examination committee.

Registration for examinations:
Via the NEPTUN system.

Opportunities to retake the exam:
According the Study and Examination Policy

Literature, i.e. printed, electronic and online notes, textbooks, tutorials (URL for online material):

Recommended 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
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
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.
Oral Anatomy, Histology and Embryology, 4th Edition, by B. Berkovitz Paperback with STUDENT CONSULT Online Access and e-book ISBN: 9780723434115 Copyright: 2009
McMinn's Color Atlas of Head and Neck Anatomy, by Logan, Reynolds, Rice & Hutchings, 5th Edition, Elsevier 2016
Functional Anatomy, Histology and Embryology for medical and dental students by M. Réthelyi and J. Szentágothai, Medicina, 2018.
The Developing Human – Clinically Oriented Embryology, 10th ed. by KL Moore, TVN Persaud and M Torchia, Saunders, 2015; ISBN 9780323313384

Illustrated Dental Embryology, Histology, and Anatomy, 3rd Edition by Mary Bath-Balogh ISBN: 9781437717303, 2011.
Netter's Head and Neck Anatomy for Dentistry, 3rd Edition, Elsevier, 2016.
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
Neuroanatomy An Illustrated Colour Text, 4th Edition by Crossman & Neary Publication Date: 13/04/2010 ISBN-13: 9780702030864
Langmann's Medical Embryology, 13th Edition by TW Sadler, Wolters Kluwer, ISBN 9781469897806, 2014

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

Signature of Subject Director/Coordinator:

Signature(s) of the head(s) of the Institute(s):

Date: 2021. 06. 26.

Credit Transfer Committee's opinion:

Comment of the Dean's Office:

Signature of the Dean:

[1] Csak abban az esetben kell megadni, ha a tárgy az adott nyelven is meghírdetésre kerül.
[2] Dékáni Hivatal tölti ki, jóváhagyást követően.
[3] Az elméleti és gyakorlati oktatást órákra (hetekre) lebontva, sorszámozva külön-külön kell megadni, az előadók és a gyakorlati oktatók nevének feltüntetésével. Mellékletben nem csatolható!
[4] Pl. terepgyakorlat, kórlapelemzés, felmérés készítése, stb.
[5] Pl. házi feladat, beszámoló, zárthelyi stb. témaköre és időpontja, pótlásuk és javításuk lehetősége.
[6] Elméleti vizsga esetén kérjük a tételsor megadását, gyakorlati vizsga esetén a vizsgáztatás témakörét és módját .
[7] Az elméleti és gyakorlati vizsga beszámításának módja. Az évközi számonkérések eredményeink beszámítási módja.