

Semmelweis University
Department of Anatomy, Histology and Embryology
2018

Faculty of Medicine
2nd year / 2nd semester

ANATOMY HANDBOOK



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Anatomy, Histology and Embryology for EM students

TEACHING DEPARTMENT:

SEMMELWEIS UNIVERSITY

Department of Anatomy, Histology and Embryology

Budapest, Tűzoltó utca 58.

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 II

2nd year 2nd (4th) semester announcements

Acceptance of the semester: active participation in lectures and dissection room classes 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 both lectures and practical classes.

Midterm examinations: During the 4th semester, both practical and theoretical knowledge will be regularly evaluated. The **two anatomy** mid-terms include both identification of several structures on the specimen and theoretical questions related to the subject.

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

Students might be asked to present their histology notes/notebooks, containing the drawings, during the final exam.

FINAL EXAMINATIONS

ALL STUDENTS WILL SIT FOR THE SAME (NEW) E-LEARNING TYPE OF EXAMINATION

Retake and FM students will have to join the regular students in the final examination, so the previous type of oral etc. examination will not be offered to anybody.

Please make sure you have a SeKA account before the examination period starts.

*N.B. – In case, neither the first nor the repeated takes of the final exam have been successful during the summer examination period, the students may register for a **CV final course** for the following semester, or, they may **reregister for ANA4** and repeat the semester in the following academic year.*

EM II.

Subject matter of the 4th semester

I. Topographical anatomy in regions and sections including clinical relevances

- a) upper and lower limbs
- b) internal organs of the head&neck region
- c) thoracic and abdominal wall
- d) organs of the thoracic cavity
- e) organs of the abdominal cavity
- f) organs of the pelvis
- g) perineum

Test I.

Topic: **Ventral regional anatomy** of the trunk and the limbs. Body cavities, internal organs (except for the head&neck and the superficial perineal structures).

Date: Week 7, March 19-23.

Test II.

Topic: **Dorsal regional anatomy** and internal organs of the head&neck region. Topography of the nuchal regions, trunk, limbs and perineum.

Date: Week 11, April 23-27.

II. Lectures on the basic concept of Histology (ground tissues and organ systems)

Final examination

Topics: Chapters of the four semesters in anatomy, histology, embryology and cell biology where relevant.

The final exam consists of three parts:

1. Written pretest (Anatomy, Histology, Embryology questions)
2. Histology (3 specimens)
3. Anatomy (Identification of structures on anatomical prosections, including relevant theoretical and developmental questions)

**Academic Year 2017/2018 Faculty of Medicine, Second Year, Second Semester
EM II. Groups 1 - 8**

Week	Lectures Monday 14.30-15.15	Dissection room Mon (1-8)
Week 1 02. 5-9. (02.07-08.)	Topographical anatomy of the lower limb, gait mechanism	Ventral regions of the limbs (<i>prosections</i>) Lower limb (bones, joints, muscles, vessels, nerves)
Week 2 02.12-16.	Topographical anatomy of the upper limb, axillary fossa	Ventral regions of the limbs (<i>prosections</i>) Upper limb (bones, joints, muscles, vessels, nerves)
Week 3 02.19-23.	Topographical and surface anatomy of the thorax, clinical relevance. Regional lymph nodes, with special reference to the mamma.	Ventral regions of the thorax, mammary region (<i>prosections</i>) Topography and sectional anatomy. Mediastinum. Heart, valves, pericardium, lung, pleura.
Week 4 02.26-03.02.	Topographical and sectional anatomy of the thorax. Topography of pleura and pericardiac punctures.	Muscles and skeletal elements of the thorax. Diaphragm (<i>prosections</i>). Abdominal surface projections. Topography of intraperitoneal organs.
Week 5 03.05-10.	Topographical and surface anatomy of the abdomen. Projection of internal organs, peritoneal relations	Abdominal wall, rectus sheath, hernia canals (<i>prosections</i>). Retroperitoneum. Urinary system. Cross sections of the abdominal cavity.
Week 6 03.12-16.	Topography and sectional anatomy of the abdomen and the retroperitoneum. Arterious and venous anastomotic systems	Topography of the lesser pelvis. Syntopy and blood supply of the rectum. Portocaval anastomoses. Ventral regions of limbs (<i>prosections</i>)
Week 7 03.19-23.	Topographical and sectional anatomy of the male pelvis and perineum. Topographical and sectional anatomy of the female pelvis and perineum.	Midterm test 1. Ventral regional anatomy of the trunk and the limbs. Body cavities, internal organs (except for the head&neck and the superficial perineal structures).
Easter break /Spring holidays 03.26-30.		
Week 8 04.02-06. <i>Easter Monday</i>	-	Dorsal regions of limbs and the trunk (<i>prosections</i>) Nape and nuchal region, spinal cord 'in situ', gluteal region. No class for Groups 1-8
Week 9 04.09-13.	Topographical and sectional anatomy of the head. Spaces and content of the neurocranium.	Dorsal regions of limbs and the trunk (<i>prosections</i>) Topographical and sectional anatomy of the male pelvis and perineum.
Week 10 04.16-21. <i>Monday class on Saturday</i>	Topographical anatomy of the viscerocranium. External carotid artery, trigeminal nerve. Histological revision of ground tissues. Histology of vessels and lymphatic organs including cell biological relevances. (on Saturday)	Dorsal regions of limbs and the trunk (<i>prosections</i>) Topographical and sectional anatomy of the female pelvis and perineum. Replacement class for Groups 1-8 on Saturday for 04.30.
Week 11 04.23-27. <i>04.24. Faculty Day</i>	Topography of cervical fasciae and spaces, sectional anatomy of the neck. Clinical relevances.	Midterm test 2. Dorsal regions Internal organs of the head&neck. Topography of the nuchal region, trunk, limbs and perineum.
Week 12 04.30-04. <i>04.30-05.02</i> COMPETITION 1	No lecture on Monday May 1 long weekend	Topographical anatomy of the brain and spinal cord. Cranial nerves. Dural topography. Skull base, orbit, organs of special senses. Classes are held on 04.21 instead of 04.30.
Week 13 05.07-11. COMPETITION 2	Histology of the respiratory system and the gastrointestinal tract including cell biological relevances.	Topographical anatomy of the nasal cavity¶nasal sinuses, oral cavity, muscles of facial expression and mastication, TMJ. Oral diaphragm, para- and retropharyngeal spaces. Muscles, fasciae, viscera and cross section of the head&neck region.
Week 14 05.14-18.	Histology of the urinary and genital systems including cell biological relevances.	Prosected specimen demonstration of the final examination. Cross sections, placenta, fetus.

Academic Year 2017/2018 Faculty of Medicine, Second Year, Second Semester
EM II. Groups 9 – 17

Week	Lecture Monday 9.00-9.45	Dissection room Mon (10-13) Tues (14-15) Thur (9-16-17)
Week 1 02. 5-9.	Topographical anatomy of the lower limb, gait mechanism	Ventral regions of the limbs (<i>prosections</i>) Lower limb (bones, joints, muscles, vessels, nerves)
Week 2 02.12-16.	Topographical anatomy of the upper limb, axillary fossa	Ventral regions of the limbs (<i>prosections</i>) Upper limb (bones, joints, muscles, vessels, nerves)
Week 3 02.19-23.	Topographical and surface anatomy of the thorax, clinical relevance. Regional lymph nodes, with special reference to the mamma.	Ventral regions of the thorax, mammary region (<i>prosections</i>) Topography and sectional anatomy. Mediastinum. Heart, valves, pericardium, lung, pleura.
Week 4 02.26-03.02.	Topographical and sectional anatomy of the thorax. Topography of pleura and pericardiac punctures.	Muscles and skeletal elements of the thorax. Diaphragm (<i>prosections</i>). Abdominal surface projections. Topography of intraperitoneal organs.
Week 5 03.05-10.	Topographical and surface anatomy of the abdomen. Projection of internal organs, peritoneal relations	Abdominal wall, rectus sheath, hernia canals (<i>prosections</i>). Retroperitoneum. Urinary system. Cross sections of the abdominal cavity.
Week 6 03.12-16. (03.15-16. National Holiday)	Topography and sectional anatomy of the abdomen and the retroperitoneum. Arterious and venous anastomotic systems	Topography of the lesser pelvis. Syntopy and blood supply of the rectum. Portocaval anastomoses. Ventral regions of limbs (<i>prosections</i>) No class for Groups 9-16-17 on Thursday
Week 7 03.19-23.	Topographical and sectional anatomy of the male pelvis and perineum. Topographical and sectional anatomy of the female pelvis and perineum.	Midterm test 1. Ventral regional anatomy of the trunk and the limbs. Body cavities, internal organs (except for the head&neck and the superficial perineal structures).
Easter break /Spring holidays 03.26-30.		
Week 8 04.02-06. Easter Monday	-	Dorsal regions of limbs and the trunk (<i>prosections</i>) Nape and nuchal region, spinal cord 'in situ', gluteal region. No class for Groups 10-13
Week 9 04.09-13.	Topographical and sectional anatomy of the head. Spaces and content of the neurocranium.	Dorsal regions of limbs and the trunk (<i>prosections</i>) Topographical and sectional anatomy of the male pelvis and perineum.
Week 10 04.16-21. Monday class on Saturday	Topographical anatomy of the viscerocranium. External carotid artery, trigeminal nerve. Histological revision of ground tissues. Histology of vessels and lymphatic organs including cell biological relevances. (on Saturday)	Dorsal regions of limbs and the trunk (<i>prosections</i>) Topographical and sectional anatomy of the female pelvis and perineum. Dorsal regions of limbs and the trunk (<i>prosections</i>) Topographical and sectional anatomy of the female pelvis and perineum. Replacement class for Groups 10-13
Week 11 04.23-27. 04.24. Faculty Day	Topography of cervical fasciae and spaces, sectional anatomy of the neck. Clinical relevances. (Remenár Éva)	Midterm test 2. Dorsal regions Internal organs of the head&neck. Topography of the nuchal region, trunk, limbs and perineum.
Week 12 04.30-04. 04.30-05.02 COMPETITION 1	No lecture on Monday May 1 long weekend	Topographical anatomy of the brain and spinal cord. Cranial nerves. Dural topography. Skull base, orbit, organs of special senses. No class for Groups 10-13 (Mon) and 14-15 (Tues)
Week 13 05.07-11. COMPETITION 2	Histology of the respiratory system and the gastrointestinal tract including cell biological relevances.	Topographical anatomy of the nasal cavity¶nasal sinuses, oral cavity, muscles of facial expression and mastication, TMJ. Oral diaphragm, para- and retropharyngeal spaces. Muscles, fasciae, viscera and cross section of the head&neck region.
Week 14 05.14-18.	Histology of the urinary and genital systems including cell biological relevances.	Prosected specimen demonstration of the final examination. Cross sections, placenta, fetus.

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.

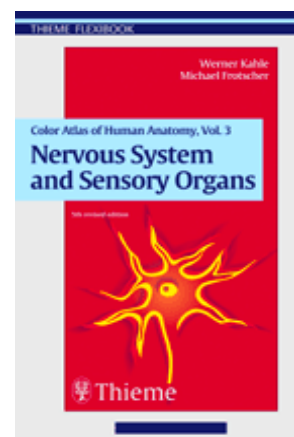
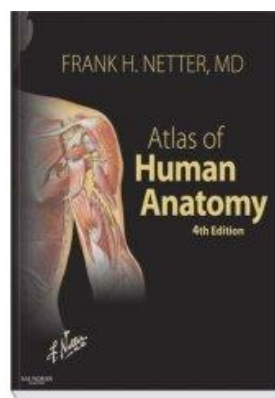
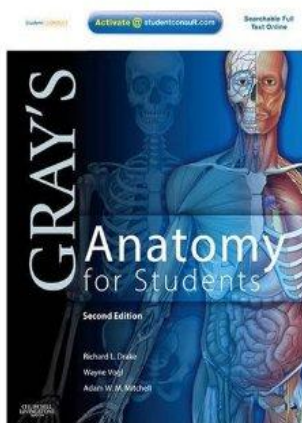
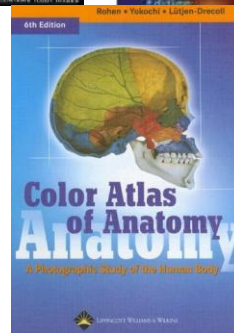
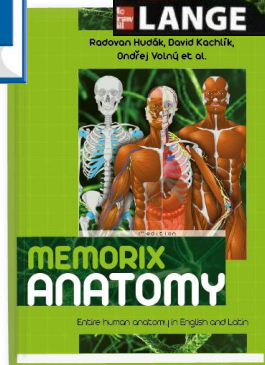
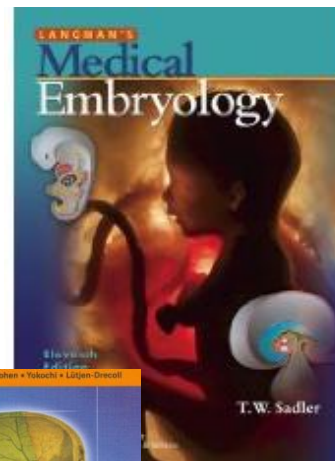
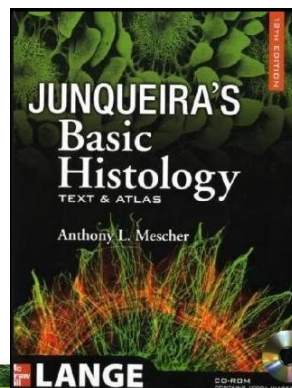
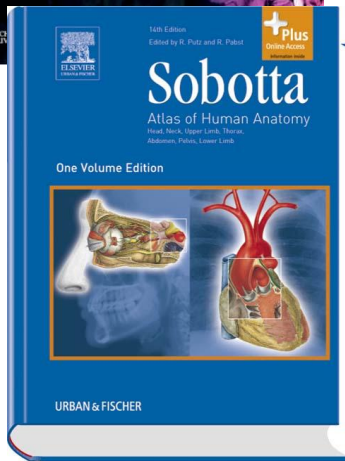
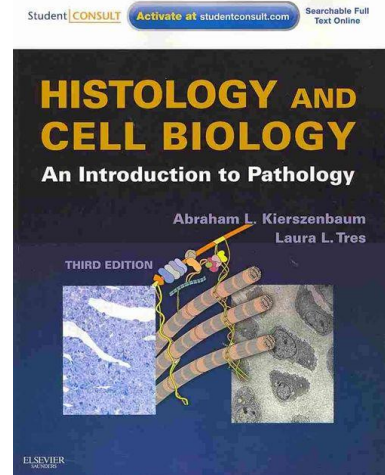
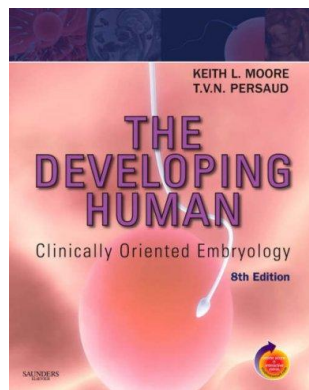
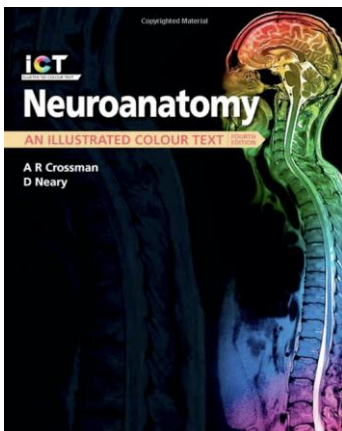
Photos, or videos of blackboard/smart board drawings or anatomical or histological schematics can only be made with the agreement and in the presence of the lab instructor.

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 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!

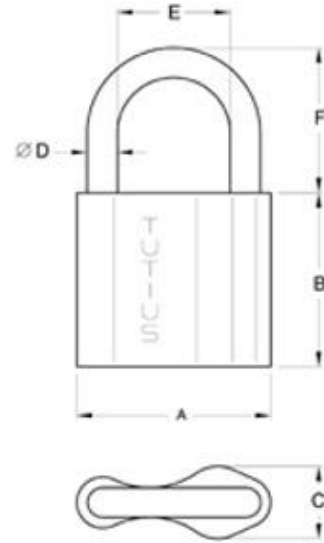
RECOMMENDED BOOKS



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

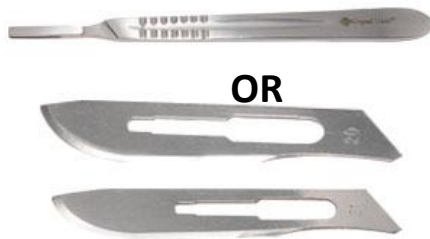
PADLOCK SIZE: 6 mm

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 FINAL EXAMINATION IN ANATOMY, HISTOLOGY AND EMBRYOLOGY

EMBRYOLOGY

Spermatogenesis
Oogenesis, Female reproductive cycles
Fertilization, cleavage of the zygote
Blastocyst formation. The bilaminar embryonic disc
Implantation
Gastrulation, the notochord
Neurulation
Development and differentiation of the neural tube
Derivatives of the ectoderm
Derivatives of the endoderm
Differentiation of the mesoderm. Formation and derivatives of the somites
Derivatives of the mesoderm
Lateral mesoderm and its derivatives
Folding of the embryo
Development of the primitive cardiovascular system and the placental circulation
The structure of the placenta
Fetal membranes. Umbilical cord
The embryonic and fetal periods. Parturition, multiple birth
Stages of human prenatal development
Development of the limbs
Development of the skull
Development of the muscular system
Early development of the heart. Folding of the heart tube.
Development and partitioning of the primitive atrium
Development and partitioning of the primitive ventricle.
The aorticopulmonary septum.
Development of the great arteries. Derivatives of the aortic arches.
Development of the inferior vena cava and the portal vein.
Development of the superior vena cava, the azygos and hemiazygos veins.
The fetal and neonatal circulation
Development of the face and palate
Development of nasal cavity and paranasal sinuses
Development of the teeth and the tongue
Development of the branchial arches and their derivatives
Development of laryngo-tracheal tube, bronchi and the lung
Development of branchial grooves, the pharyngeal pouches and their derivatives
The formation and differentiation of the foregut
Formation and development of the midgut
Development of liver and pancreas
The formation and differentiation of hindgut

Development of the kidneys
Development of the urinary passages
Development of the gonads
Development of the male genital ducts and auxiliary glands
Development of the female genital ducts and auxiliary glands
Development of the male and female external genitalia
Formation and division of the body cavities
Development of the peritoneum
Development and differentiation of the spinal cord
Development of the forebrain
Development of the peripheral nervous system
Development of the eye and optic nerve
Development of the organs of hearing and equilibration.

HISTOLOGY

Concept of basic tissues .
Definition and classification of epithelial tissue
Simple epithelia
Stratified epithelia
Membrane specialisations of epithelia
Glandular epithelia
Pigment epithelium and sensory epithelium
Cells of connective tissue
Ground substance and fibres of connective tissue
Types of connective tissue
Blood and the formed elements of blood
Bone marrow maturation of erythrocytes and platelets
Maturation of granulocytes, lymphocytes and monocytes.
Histology of cartilage
Histology of the bone
Intramembranous ossification
Endochondral ossification
Growth and remodeling of bone
Smooth muscle and myoepithelial cells
Histology skeletal muscle
Cardiac muscle
Sarcoplasmic reticulum and transverse tubule system
Histology of the neuron
Microscopical structure of neurons in the CNS
Neuroglia
Nervous and supporting cells in the CNS
Neurons and supporting cells of the neural crest
Nerve fibres, Myelin sheath
Receptors. Effectors. Motor end-plate
Interneuronal synapses
Gross anatomy of pituitary gland. Histology and development of neurohypophysis

Blood supply of pituitary. Histology of adenohypophysis
Gross anatomy and histology of pineal body
Gross anatomy, histology and development of the thyroid gland
Gross anatomy, histology and development of the parathyroid glands
Microscopical anatomy and development of adrenal cortex
Gross anatomy of adrenal glands, Histology and development of adrenal medulla
Histology of pancreas and the islets of Langerhans
Microscopical anatomy of lymph nodes
Gross and Microscopical anatomy of the spleen
Microscopical anatomy of thymus
Microscopical anatomy of tonsils
Microscopical anatomy of arteries and arterioles
Microscopical anatomy of capillaries and veins
Microscopical anatomy of skin
Microscopical anatomy of epidermal appendages of skin and mammary glands
Microscopical structure of the wall in the gastrointestinal tract
Microscopical structure of exocrine glands
Microscopical structure of intestinal villi

LOCOMOTOR SYSTEM

Architecture and classification of bones
Fibrous and cartilaginous joints
Components of synovial joints
Classification of synovial joints. Movements and mechanisms
Structure and actions of somatic muscles
Structure of the vertebral column and the muscles responsible for its movements
Movements of the head and the muscles participating in them
Osteofibrous structure of the thoracic cage
Joints of the shoulder girdle and the muscles acting on them
The shoulder joint and the muscles acting on it
The axilla, the quadrangular and triangular spaces
The elbow joint, movements and muscles acting on it
The cubital fossa
Muscles and cross section of the arm
Muscles and cross section of forearm
Structure and movements at the wrist joint and the muscles acting on it
Osteofibrous spaces and muscle compartments of the hand
Joints of fingers and muscles concerned in their movements
Joints of the thumb and the muscles concerned in their movements
Structure of the osteofibrous pelvis
Muscles of the buttock, the posterior abdominal wall and the pelvis (external and internal muscles of the hip).
The hip joint and muscles concerned in its movements
Osteofibrous compartments, muscles and cross section of the thigh
The knee joint and muscles concerned in its movements
Popliteal fossa

Femoral sheath, vascular and muscular compartments. Adductor canal
Osteofibrous compartments, muscles and the cross section of the leg
Ankle joint and muscles concerned in its movements
Subtalar and talocalcaneonavicular joints and muscles acting on them
Structure of the foot. Arches of the foot
Osteofibrous compartments of the foot
Mechanism of walking
Anterior cranial fossa (composition, boundaries, connections)
Middle cranial fossa (composition, boundaries, connections)
Posterior cranial fossa (composition, boundaries, connections)
Walls and connections of the orbit
Walls and connection of the nasal cavity
Inferior surface and connections of the base of the skull
Bony walls of the oral cavity, the temporal and infratemporal fossa
Walls and connections of the pterygopalatine fossa
Temporomandibular joint and the muscles concerned in its movements
Diaphragm
Lateral superficial abdominal muscles and fasciae
Rectus abdominis muscle and its sheath
Inguinal canal
Femoral canal
Muscles of the pelvic floor
Superficial muscles of the neck and the muscle triangles
Deep muscles of the neck and the laminae of the cervical fascia
Muscles of facial expression

CIRCULATION

Shape and surfaces of the heart
Skeleton of the heart
Structure of the myocardium
Chambers of the heart
Endocardium and the valves of the heart
Conducting system of the heart
Blood supply of the heart
Pericardium
Surface anatomy of the heart. Heart sounds
Position and radiology of the heart.
The pulmonary circulation
Subdivisions and topography of the aorta
Arch of the aorta and its branches
Subclavian artery and its branches
Axillary artery and its branches
Arteries and veins of the arm and forearm
Vessels of the hand
External carotid artery and its branches
Maxillary artery and its branches

Course and distribution of the internal carotid artery
Venous drainage of the head
Course and branches of the thoracic aorta
Course and branches of the abdominal aorta
Coeliac trunk and its branches
Superior mesenteric artery and its branches
Inferior mesenteric artery and its branches
Branches of the internal and external iliac arteries
Vessels of the thigh and leg
Vessels of the foot
Course and tributaries of superior vena cava
Course and tributaries of inferior vena cava
Portal system of veins. Communication between portal and systemic veins
Venous and lymphatic drainage of the body wall including the breast
Lymph nodes and lymphatic drainage of head and neck
Lymphatic drainage of upper limb
Lymphatic drainage of lower limb
Thoracic and the right lymphatic ducts.

ORGANS OF SPECIAL SENSES

Fibrous coat of the eyeball
Vascular coat of the eyeball
Retina
Visual pathways
Optic lens and the convergence-accomodation reaction
Chambers of eye and vitreous body
Extrinsic muscles of the eyeball
Eyelids, conjunctiva, fascial sheath of eyeball. Lacrimal apparatus
External ear and tympanic membrane
Walls of the tympanic cavity. Auditory tube
Shape, joints and muscles of auditory ossicles.
Bony and membraneous labyrinth
Bony cochlea and cochlear duct
Auditory pathways
Organs of taste and olfaction

INTERNAL ORGANS

Oral cavity
Gross anatomy and histology of tongue
Morphology of the permanent teeth, blood and nerve supply
Fine structure of dentin and enamel
Histology of cementum and periodontium
Development of teeth. Dentition
Gross anatomy, histology and topography of salivary glands
Isthmus of fauces
Gross anatomy and muscles of pharynx

Microscopical anatomy, blood and nerve supply of pharynx
Topography of pharynx. Para and retropharyngeal spaces
Gross anatomy, histology and topography of oesophagus
Gross anatomy and peritoneal relations of stomach
Microscopical anatomy of stomach
Gross anatomy of duodenum
Gross anatomy of jejunum and ileum
Microscopical anatomy of small intestines
Microscopical structure of intestinal villi
Gross anatomy of large intestines and vermiform appendix
Microscopical anatomy of large intestines
Gross anatomy and histology of rectum and anal canal
Gross anatomy and peritoneal relations of liver
Microscopical structure of liver
Gross and Microscopical anatomy of gall bladder and bile ducts
Gross anatomy and topography of pancreas
Structure of nasal cavity and paranasal sinuses
Skeleton of larynx. Joints and fibroelastic membranes
Cavity of larynx. Mucous membrane and muscles
Gross anatomy and histology of trachea
Bronchial tree. Histology of the lung
Gross anatomy of the lung
Pleura
Subdivision and contents of mediastinum
Gross anatomy of the kidney
Microscopical anatomy of the kidney
Gross anatomy and histology of renal pelvis and ureter
Gross and Microscopical anatomy of urinary bladder
Gross anatomy and histology of male and female urethra
Gross anatomy of the testis
Histology of the testis
Gross and Microscopical anatomy of epididymis and ductus deferens
Spermatic cord, scrotum and coverings of testis
Gross anatomy and histology of seminal vesicle and prostate
Gross anatomy and histology of penis. Mechanism of erection
Gross anatomy of the ovary
Histology of the ovary
Gross and Microscopical anatomy of the uterine tube
Gross anatomy and fixation of the uterus
Histology of the uterus. Menstrual cycle
Gross anatomy and histology of vagina and female external genitalia
Topography of female genital organs in the pelvis. Connective tissue spaces, peritoneal relations
Topography of male genital organs in the pelvis. Connective tissue spaces, peritoneal relations
Anatomy of peritoneum . Lesser and greater omentum. Omental bursa, mesentery.

NERVOUS SYSTEM

Gross anatomy of spinal cord. Spinal segment. Spinal nerve. Blood supply and meninges of the spinal cord

Microscopical structure of spinal cord

Spinal proprioceptive reflex arc

Spinal flexor (withdrawal) reflex arc

Spinal autonomic reflexes

Fourth ventricle

Gross and Microscopical anatomy of medulla oblongata

Gross and Microscopical anatomy of pons

Gross and Microscopical anatomy of midbrain

Cranial nerve nuclei

Tracts of the brainstem

Reticular formation and monoaminergic brainstem systems

Gross and Microscopical anatomy of cerebellum

Afferent and efferent connections of cerebellum

Anatomy, blood supply and development of the diencephalon

Third ventricle

Gross and Microscopical anatomy of thalamus

Hypothalamo-hypophyseal systems

Gross anatomy of hemispheres

Gross and Microscopical anatomy of basal nuclei

Lateral ventricles

Arterial circle of Willis and veins of the brain

Microscopical structure of cerebral cortex. Cortical areas

Spinothalamic tract

Dorsal funiculus-medial lemniscus system

Pyramidal tract

Extrapyramidal system

Limbic system

Cranial dura mater and its sinuses

Arachnoid and pia mater. Subarachnoid cisterns Cerebrospinal fluid

Central nuclei and peripheral distribution of cranial nerves III., IV., VI.

Nuclei of trigeminal nerve and distribution of ophthalmic nerve

Peripheral distribution of maxillary nerve

Peripheral distribution of mandibular nerve

Central nuclei and peripheral distribution of facial nerve

Central nuclei and peripheral distribution of glossopharyngeal nerve

Central nuclei and peripheral distribution of vagus nerve

Nuclei and branches of accessory and hypoglossal nerves

Cervical plexus

Brachial plexus

Dorsal rami of spinal nerves. Intercostal nerves

Lumbar plexus

Sacral plexus

General structure of autonomic nervous system

Cervical and thoracic part of sympathetic trunk
Abdominal and pelvic part of sympathetic trunk
Cranial parasympathetic
Sacral parasympathetic

CELL BIOLOGY TOPIC LIST (FOR OLD CURRICULUM STUDENTS ONLY)

Light and electron Microscopical histotechniques
Immunohistochemistry
Structure of the whole membrane
Structure and significance of the glycocalyx
Protein components of the cell membrane
Transport mechanisms through membranes
Exo- and endocytotic transports
SER, RER (structure, function)
Golgi apparatus
The lysosomal system
Vesicular transport
Protoplasm, cytoplasm, cytosol, nucleoplasm
Mitochondria
Cell nucleus
Chromatin
Surface specialisations
Intercellular substance
Basement membrane, basal lamina
Intercellular contacts
Cell polarity
Cytoskeletal elements, functions
The molecular basis of ameboid movement
Actin-myosin system
Cell cycle
Stages of mitosis
Chromosomal sets, description of the genome
Regulation of cell division
Stages of meiosis. Crossing over
Comparisons of the male and female gametes
Stem cell, progenitor cell, precursor cell
Comparison of apoptosis and necrosis.
Composition of synapses.
Composition and formation of the myelin sheath.
Composition of the blood - brain barrier, blood – CSF barrier.