

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

**Faculty of Medicine**  
**2<sup>nd</sup> year / 2<sup>nd</sup> semester**

# **ANATOMY HANDBOOK**



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Head of Department  
Rector Emeritus of the Semmelweis University



# Anatomy, Histology and Embryology for EM students

## TEACHING DEPARTMENT:

SEMMELWEIS UNIVERSITY

Department of Anatomy, Histology and Embryology

Budapest, Tűzoltó utca 58.

H-1094 Budapest

[www.ana.sote.hu](http://www.ana.sote.hu)

## 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

## Announcements

### **Subject matter of the 4th semester**

Topographical and sectional anatomy of the human body, including developmental, histological and clinical relevances.

### **Acceptance of the semester**

Active participation in dissection room lab sessions is obligatory. Students should attend at least 75% of the scheduled hours, including the obligatory midterm test\*, to gain a signature proving the validity of the semester. Absences are therefore limited in 25%.

### **Obligatory midterm test**

**Topics:** Ventral regional anatomy of the head&neck, trunk and the limbs  
Body cavities, internal organs

**Date:** Week 8. (March 23-27)

*In case of absence\* from the test students will have to present themselves at the retake midterm (TBA).*

### **Departmental competition**

The Department of Anatomy, Histology and Embryology invites **all students with a successful anatomy 3 examination** to participate in the annual competition (written, e-learning type test).

CV students therefore are not eligible to participate. A preliminary registration will be required from students wishing to take part in the competition.

**Time and place:** Week 11, April 23. Faculty Day; held in the Histology Laboratories

**Topics:** Subject matter of the 4 semesters

Students achieving an outstanding result in the competition will be exempted with a mark 5 from the written pretest and the Histology part so they will need to sit for the practical/oral dissection part of the final examination only.

### **Final examination**

**Topics:** Chapters of the four semesters in anatomy, histology, embryology

**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 2019/2020      Faculty of Medicine      EM II.**  
**Second Year, Second Semester      Groups 1 – 8**

Week	Lectures <i>Wednesday 13.00-13.45</i>	Dissection room <i>Wed 8.00-9.40 (EM 1-6) Fri 10.15-11.45 (EM 7-8)</i>
Week 1 02. 3-7.	<i>Topography of cervical fasciae and spaces, sectional anatomy of the neck. Clinical relevances Georg Feigl (Graz University, Anatomy Dept)</i>	Topographical anatomy of the nasal cavity&paranasal sinuses, oral cavity, muscles of facial expression and mastication, TMJ. Oral diaphragm, para- and retropharyngeal spaces..
Week 2 02.10-14	Topographical anatomy of the viscerocranium. External carotid artery, trigeminal nerve. <b>Altdorfer</b>	Muscles, fasciae, viscera and cross sections of the head&neck region Ventral regions of the limbs ( <i>prosections</i> ) Lower limb (bones, joints, muscles, vessels, nerves)
Week 3 02.17-21.	Topographical anatomy of the lower limb, gait mechanism Topographical anatomy of the upper limb, axillary fossa <b>Kozsurek</b>	Ventral regions of the limbs ( <i>prosections</i> ) Upper limb (bones, joints, muscles, vessels, nerves)
Week 4 02.24-28.	Topographical and surface anatomy of the thorax, clinical relevance. Regional lymph nodes, with special reference to the mamma. <b>Székely / Clinician</b>	Ventral regions of the thorax, mammary region ( <i>prosections</i> ) Topography and sectional anatomy. Heart, valves, Mediastinum. pericardium, lung, pleura.
Week 5 03.2-6.	Topographical and sectional anatomy of the thorax. Topography of pleura and pericardiac punctures. <b>Kozsurek</b>	Muscles and skeletal elements of the thorax. Diaphragm ( <i>prosections</i> ). Abdominal surface projections. Topography of intraperitoneal organs.
Week 6 03.9-13.	Topographical and surface anatomy of the abdomen. Projection of internal organs, peritoneal relations <b>Lendvai</b>	Abdominal wall, rectus sheath, hernia canals ( <i>prosections</i> ). Retroperitoneum. Urinary system. Cross sections of the abdominal cavity.
Week 7 03.16-20. TDK conference 03.18-19)	-----	Topography of the lesser pelvis. Syntopy and blood supply of the rectum. Portocaval anastomoses.
Week 8 03.23-27.	Topography and sectional anatomy of the abdomen and retroperitoneum. Arterious and venous anastomotic systems <b>Lendvai</b>	<b>Midterm test</b> Ventral regional anatomy of the head&neck, trunk and the limbs. Body cavities, internal organs
Week 9 03.30-04.3	Topographical and sectional anatomy of the male pelvis and perineum. <b>Hanics</b>	Topographical and sectional anatomy of the female pelvis and perineum.
<b>04.6-04.10.</b>	<b>EASTER BREAK – SPRING HOLIDAYS</b>	
Week 10 04.13-17.	Topographical and sectional anatomy of the female pelvis and perineum. <b>Somogyi</b>	Dorsal regions of limbs and the trunk ( <i>prosections</i> )
Week 11 04.20-24. <b>04.23.</b> <b>Faculty Day</b> <b>COMPETITION</b>	Topographical and sectional anatomy of the head. Spaces and content of the neurocranium. <b>Kocsis</b>	Dorsal regions of limbs and the trunk Nape and nuchal region, spinal cord 'in situ', gluteal region, perineum.
Week 12 04.27-05.01 Friday May 1	<i>Histological revision of ground tissues. Histology of vessels and lymphatic organs Ádám</i>	<b>NO DISSECTION CLASS ON FRIDAY</b> <i>Topography of the nuchal region, trunk,limbs and perineum.</i>
Week 13 05.04-08.	<i>Histology of the respiratory system and the gastrointestinal tract Ádám</i>	Topographical anatomy of the brain and spinal cord. Cranial nerves. Dural topography. Skull base, orbit, organs of special senses.
Week 14 05.11-15.	<i>Histology of the urinary and genital systems Barna</i>	Prosected specimen demonstration of the final examination. Cross sections, placenta, fetus

**Academic Year 2019/2020      Faculty of Medicine      EM II.**  
**Second Year, Second Semester      Groups 9 – 17**

Week	Lectures <i>Monday 8.45-9.30</i>	Dissection room <i>Fri 10.15-11.45 (EM 9-12) Fri 14.00-15.30 (EM 13-17)</i>
Week 1 02. 3-7.	<i>Topography of cervical fasciae and spaces, sectional anatomy of the neck. Clinical relevances.</i> <b>Georg Feigl (Graz University, Anatomy Dept)</b>	Topographical anatomy of the nasal cavity&paranasal sinuses, oral cavity, muscles of facial expression and mastication, TMJ. Oral diaphragm, para- and retropharyngeal spaces..
Week 2 02.10-14	Topographical anatomy of the viscerocranium. External carotid artery, trigeminal nerve. <b>Kozsurek</b>	Muscles, fasciae, viscera and cross sections of the head&neck region Ventral regions of the limbs ( <i>prosections</i> ) Lower limb (bones, joints, muscles, vessels, nerves)
Week 3 02.17-21.	Topographical anatomy of the lower limb, gait mechanism Topographical anatomy of the upper limb, axillary fossa <b>Vereczki</b>	Ventral regions of the limbs ( <i>prosections</i> ) Upper limb (bones, joints, muscles, vessels, nerves)
Week 4 02.24-28.	Topographical and surface anatomy of the thorax, clinical relevance. Regional lymph nodes, with special reference to the mamma. <b>Székely / Clinician</b>	Ventral regions of the thorax, mammary region ( <i>prosections</i> ) Topography and sectional anatomy. Heart, valves, Mediastinum. pericardium, lung, pleura.
Week 5 03.2-6.	Topographical and sectional anatomy of the thorax. Topography of pleura and pericardiac punctures. <b>Kozsurek</b>	Muscles and skeletal elements of the thorax. Diaphragm ( <i>prosections</i> ). Abdominal surface projections. Topography of intraperitoneal organs.
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<b>04.6-04.10.</b>	<b>EASTER BREAK – SPRING HOLIDAYS</b>	
Week 10 04.13-17.	---- <b>Easter Monday</b>	Dorsal regions of limbs and the trunk ( <i>prosections</i> )
Week 11 04.20-24. <b>04.23.</b> <b>Faculty Day</b> <b>COMPETITION</b>	Topographical and sectional anatomy of the head. Spaces and content of the neurocranium. <b>Kocsis</b>	Dorsal regions of limbs and the trunk Nape and nuchal region, spinal cord 'in situ', gluteal region, perineum.
Week 12 04.27-05.01 <i>Friday May 1</i>	<i>Histological revision of ground tissues. Histology of vessels and lymphatic organs</i> <b>Puskár</b>	<b>NO DISSECTION CLASS ON FRIDAY</b> <i>Topography of the nuchal region, trunk,limbs and perineum.</i>
Week 13 05.04-08.	<i>Histology of the respiratory system and the gastrointestinal tract</i> <b>Tóth zs</b>	Topographical anatomy of the brain and spinal cord. Cranial nerves. Dural topography. Skull base, orbit, organs of special senses.
Week 14 05.11-15.	<i>Histology of the urinary and genital systems</i> <b>Barna</b>	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.**

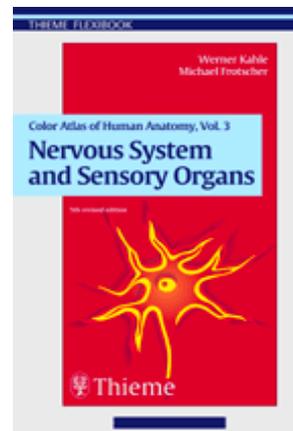
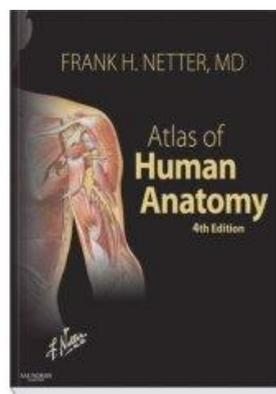
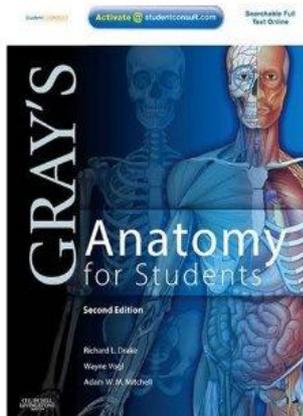
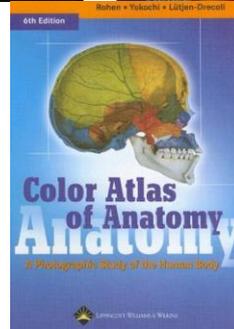
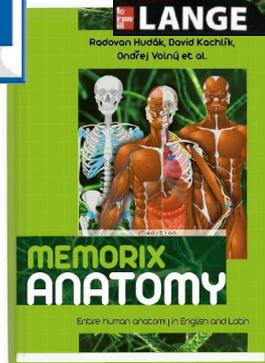
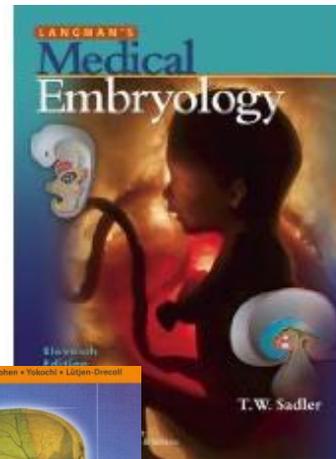
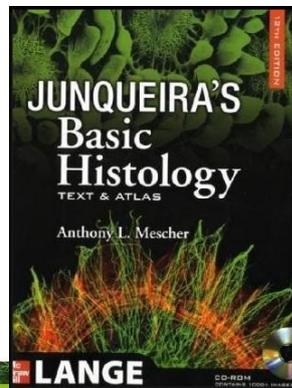
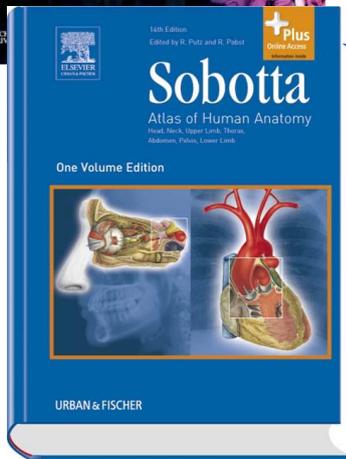
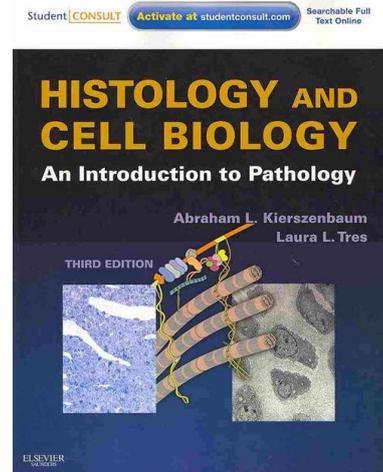
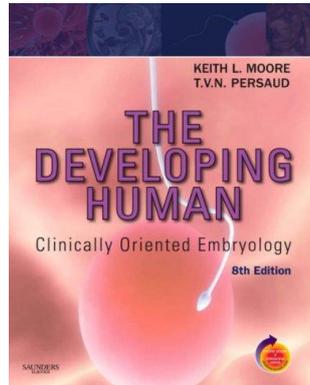
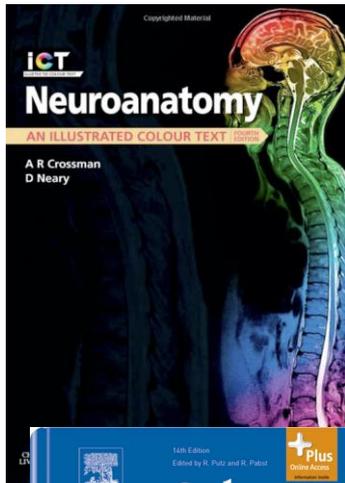
**NO OTHER RECORDINGS ARE ALLOWED WHILE IN THE DISSECTION ROOM.**

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.

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!**

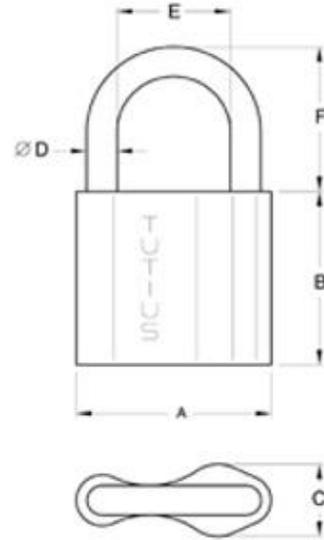
# RECOMMENDED BOOKS



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

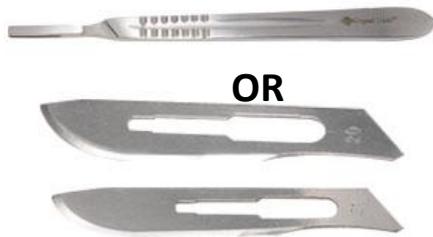
**PADLOCK SIZE: 6 mm**

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 membranous 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