SYLLABUS The cycle of instruction 2019-2025 [INT]			
Module/course name:	HUMAN ANATOMY	**Module code**	LK.3.A.001
Faculty:	II Faculty of Medicine with English Language Division		
Major:	Medical		
Specialty:			
Level of study:	I (Bachelor studies) ☐ II (Master studies) ☐ integrated Master studies **X** III (Doctoral studies) ☐		
Mode of study :	full-time **X**		
Year of study:	I **X** II ☐ III ☐ IV ☐ V ☐ VI ☐	Semester :	1**X** 2 **X** 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐
Module/course type:	obligatory **X** elective ☐		
Language of instruction:	Polish ☐ foreign **X**		

Form of education	**Hours**
Lecture	20
Seminar	
Laboratory class	175
E-learning	
Practical class	
Internship	

Student's work input (participation in class, preparation, evaluation, etc.)	**Student's hourly workload**
1. In class	**195**
2. Student's own work	**255**
Summary of the student's workload	**450**
ECTS points for module/course	**18**

EDUCATIONAL OBJECTIVES:

The Anatomy course is fundamental and absolutely essential in understanding other disciplines. The objective of the Human Anatomy Course is to familiarize the students with the structure of the human body, its organs and systems, their mutual relations, basic functions and clinical correlations. Anatomy is the study of the external and internal physical structures of a living organism and how these structures interact with one another. The emphasis of the Anatomy course is to introduce the students to anatomical terminology and concepts and to give them an insight into how this knowledge is applicable to clinical problems encountered daily by physicians.
The Anatomy course and anatomical knowledge support examination of a patient and determine the diagnosis, and provide communication of these findings to the patient and the medical professionals.
This course uses a systems based approach with topics such as back, thorax, upper limb, neuroanatomy and head and neck, abdomen and pelvis and lower limb.
Lectures emphasize important aspects of descriptive and functional anatomy, introductory medical imaging, and clinical applications, and are given by the anatomy faculty, as well as a number of clinicians. The laboratory experience allows students the unique opportunity to explore prosected donated human bodies. The goal of the Anatomy course is to give the student a fundamental working knowledge of normal human anatomy as a basis for the practice of medicine. At the end of the Anatomy course the student will be able to identify, describe, draw and label

the structures of the human body and explain their function, and to be able to solve clinical problems of altered anatomy.
During the each topic students are provided with anatomical and clinical lectures. The students identify prosected cadaveric specimens under the guidance of faculty and students have the opportunity to identify structures on radiographs, CT scan, MRI, USG and angiograms. In the small group discussion sessions students participate in clinical problem solving using group discussion. During the surface anatomy students recognize anatomical landmarks in the living human, which are very helpful during clinical examination.
After the Anatomy course, students should be able to locate, identify and functionally describe the structures of the human body, the physical relationships among them at all levels of organization using various investigative and collaborative techniques.

The matrix of learning outcomes for module/ subject with reference to verification methods of the intended educational outcomes and forms of instruction:

Learning outcome code	A student who has obtained a credit for the module/course has the knowledge/skill to:	Methods of verifying the achievement of the intended learning outcomes:	Form of instruction * provide the symbol
I. W1. A.W1	knows anatomical terminology in English	multiple choice (MCQ -Multiple Choice Questions)	Lec, Lab
I. W2. A.W2	knows the structure of the human body in the topographical aspect (upper and lower limb, chest, abdomen, pelvis, back, neck, head) and functional aspect the bone-articular system, the muscular system, the cardiovascular system, the respiratory system, the digestive system, the urinary system, sexual layouts, the nervous system and the sense organs, shared coating	multiple choice (MCQ - Multiple Choice Questions)	Lec, Lab
I. W3. A.W3	can describe topographical relationships between individual organs	observation of the student by the teacher, multiple choice (MCQ - Multiple Choice Questions)	Lab
I. U3. A.U3	is able to clarifying anatomical basics of the medical examination	observation of the student by the teacher, practical test, multiple choice (MCQ)	Lab

I. U4. A.U4	is concluding about relations between anatomical structures on the basis of diagnostic tests, in particular from scope of radiology (survey photographs, of examining with applying the X-ray contrast media, the computed axial tomography and magnetic nuclear resonance)	an extended observation by the teacher, practical test, multiple choice (MCQ)	Lab
I. U5. A.U5	is using the anatomical nomenclature in speech and writing	an extended observation by the teacher, practical test, multiple choice (MCQ), report	Lab

EXAMPLES OF METHODS VERIFYING THE ACHIEVEMENT OF THE INTENDED LEARNING OUTCOMES:
In terms of knowledge: Oral exam (*non-standardized, standardized, traditional, problem-based*).
Written exam – the student produces/identifies answers (*essay, report; structured short-answer questions /SSQ/; multiple choice questions /MCQ/; multiple response questions /MRQ/; matching test; true/false test; open cloze test*).
In terms of skills: practical exam; Objective Structured Clinical Examination /OSCE/; Mini-CEX (mini – clinical examination); completion of a given assignment; project, presentation.
In terms of social competences:
A reflective essay; an extended observation by a supervisor/tutor; 360-degree assessment (feedback from teachers, peers, patients, other co-workers); self-assessment (portfolio included).

Course content: (use keywords referring to the content of each class following the intended learning outcomes):

LECTURES:

1. Introduction to Anatomy
2. Spinal cord and spinal nerves
3. Nerves and vasculature of the thoracic wall
4. Clinical anatomy and clinical radiology of the thorax
5. Clinical anatomy of the upper limb
6. Clinical neuroanatomy
7. Cranial nerves
8. Clinical radiology of the head
9. Clinical radiology of the neck
10. Anterolateral abdominal wall. Clinical anatomy of abdominal hernias
11. Abdominal cavity and abdominal viscera
12. Innervation of the abdomen and pelvis
13. Clinical anatomy of the lower limb

Laboratory classes:

1. ANATOMICAL TERMINIOLOGY. ANATOMICAL PLANES AND DIRECTIONS. INTRODUCTION TO THE SYSTEMS. MEDICAL IMAGING SYSTEMS. Anatomical terminology. Anatomical planes and directions. Introduction to body systems: integumentary, skeletal, muscular, cardiovascular, lymphoid, and nervous. Medical imaging techniques. Define and demonstrate the following terms relative to the anatomical position: medial, lateral, proximal, distal, superior, inferior, deep, superficial, palmar, plantar, anterior/ventral, posterior/dorsal, rostral, caudal.
Describe the following anatomical planes: axial / transverse / horizontal, sagittal and coronal.
Define and demonstrate the terms used to describe the movements of the limbs and vertebral column: flexion, extension, lateral flexion, pronation, supination, abduction, adduction, medial and lateral rotation, inversion, eversion, plantarflexion, dorsiflexion, protraction, retraction and circumduction.
Describe the following systems: integumentary, skeletal, muscular, cardiovascular, lymphoid and nervous.
Define the following terms: fascias, fascial compartments, bursae, potential spaces, cartilage and bones, bone makings and formations, joints, types of muscles, skeletal muscles, cardiac striated muscle, vascular circuits, blood

vessels, nervous systems: central, peripheral, somatic and autonomic.
Define the terms somatic and visceral when used to describe parts and systems (e.g. somatic and visceral motor systems) of the body.
Describe the following medical imaging techniques: conventional radiography, computed tomography, ultrasonography, magnetic resonance imaging and nuclear medicine imaging.

2. VERTEBRAE. VERTEBRAL COLUMN.
Cervical vertebrae
Thoracic vertebrae
Lumbar vertebrae
Sacrum
Coccyx
Atlanto-occipital joints
Atlanto-axial joints
Joints of vertebral bodies
Curvatures of the vertebral column
Intervertebral disc
Zygapophysial joints
The anatomical features of a typical vertebra. Identify the atlas, axis, typical cervical, thoracic, lumbar vertebrae and sacrum and recognise their characteristic features.
The structures, regions and functions of the vertebral column. Describe the range of movement of the entire vertebral column and its individual regions.
The anatomy of intervertebral facet joints and intervertebral discs.
The role of the discs in weightbearing by the vertebral column and give examples of common disc lesions, and how they may impinge upon spinal nerve roots and / or the spinal cord.
Identify basic anatomical landmarks of the back (external occipital protuberance, C7 vertebra, angles of the scapula, medial margin of the scapula, spine of the scapula, iliac crest, and boundaries of the trapezius, latissimus dorsi, and erector spinae muscles).
Identify the vertebral level of the following bony landmarks: root of the spine of the scapula, inferior angle of the scapula, iliac crest.
Explain what makes spinal injuries stable and unstable.
Describe the anatomical basis of back pain.
The relation to root compression and the placement of epidural and spinal injections.
Describe the anatomy of lumbar puncture.
Interpret standard diagnostic images of the vertebral column and be able to recognise common abnormalities.
Interpret standard diagnostic images of the vertebral column and be able to recognise common abnormalities.

3. MUSCLES OF THE BACK.
Extrinsic back muscles
Intrinsic back muscles
Principal muscles producing movements of intervertebral joints
Suboccipital muscles and suboccipital triangle
Splenius muscle
Erector spine muscle
Transversospinalis
Interspinales
Intertransversarii
Levatores costarum
Suboccipital muscles
Identify and describe specific attachments, actions, innervation, vascularization, and relations of superficial back muscles: trapezius, latissimus dorsi, levator scapulae, rhomboid major, rhomboid minor.
Identify and describe general attachments, actions, segmental innervation, and relations of the deep back muscles (splenius capitis and cervicis, erector spinae, and transversospinalis muscles).
Identify the principal muscle groups and ligaments of the vertebral column and surface features in order to be able to perform an examination of the back, discuss their functional role in stability and movement of the vertebral column.

4. SPINAL CORD. SPINAL NERVES. DERMATOMES. SPINAL MENINGES.
Spinal cord
Spinal nerve

Spinal dura mater
Spinal arachnoid mater
Spinal pia mater
Subarachnoid space
Anterior spinal artery
Posterior spinal artery
Anterior spinal vein
Posterior spinal vein
Suboccipital nerve
Greater occipital nerve
Lesser occipital nerve
Posterior rami, nerves C3-C7
Anterior and posterior segmental medullary arteries
Great anterior segmental medullary artery
Anterior and posterior radicular artery
Anterior and posterior medullary veins
Anterior and posterior radicular veins
The spinal cord: define the boundaries of the spinal cord from top to bottom and its protection, compare and contrast white and gray matter, identify the regions of gray mater on a cross section of spinal cord, distinguish between various regions of the spinal cord using gray and white mater markings.
The spinal nerves: compare and contrast the structure and function of spinal nerves (roots, ganglia, nerves and rami), define and identify the 31 pairs of spinal nerves and describe how they form the major plexuses, distinguish between sensory, motor and mixed nerves, contrast the difference between vertebral, spinal cord and spinal nerve levels, trace a nervous impulse through all the parts of a spinal nerve.
Describe the anatomy of a spinal nerve (e.g. as exemplified by a thoracic spinal nerve, including its origin from dorsal and ventral spinal roots, its main motor and cutaneous branches and any autonomic component.
Describe the anatomical relationships of the meninges to the spinal cord and dorsal and ventral nerve roots.
Understand the segmental cutaneous innervation and vascular supply to the back.

5. THORACIC WALL. THORACIC CAGE. DIAPHRAGM. BREAST.
Pectoralis major
Pectoralis minor
Intercostal muscles
Diaphragm
Vessels and nerves of diaphragm
Intercostal nerves
Intercostal arteries
Internal thoracic artery
Intercostal veins
Thoracic vertebrae
Sternum
Ribs
Costal cartilages
Costobertebral joints
Costotransverse joints
Sternoclavicular joints
Breast
Lymphatic drainage of the breast
Serratus anterior
Serratus posterior superior and inferior
Levator costarum
Subcostal
Transversus thoracis
Fascia of thoracic wall
Costochondrial joints
Interchondrial joints
Sternocostal joints
Manubriosternal joint
Xiphisternal joint

Artery of the breast
Describe the surface projection, attachments and relationships of the diaphragm and the structures that pass through it. Explain the movements it makes during ventilation and the motor and sensory nerve supply to it and its pleural and peritoneal coverings.
Explain the anatomy of the intercostal muscles.
Describe a neurovascular bundle in a typical intercostal space and outline the structures its components supply.
Explain the movements involved in normal, vigorous and forced ventilation and describe the muscles responsible for these movements.
Describe the anatomy of the axillary lymph nodes and explain their importance in the lymphatic drainage of the breast and in the spread of tumours.
Identify major thoracic structures on standard diagnostic images and be able to recognise common abnormalities.
Demonstrate the main anatomical landmarks of the thoracic vertebrae, ribs and sternum.
Describe the anatomy of the joints between the ribs and vertebral column, the ribs and costal cartilages and the costal cartilages and sternum.
Explain the movements made at those joints during ventilation and the differences between ventilatory movements in the upper and lower chest.
Describe how the boundaries of the thoracic inlet and outlet are formed by the vertebrae, ribs, costal cartilages and sternum.
Identify major thoracic structures on standard diagnostic images and be able to recognise common abnormalities.

6. PERICARDIUM AND HEART. SYSTEMIC AND PULMONARY CIRCULATION.
Pericardium
Heart
Heart's chambers
Heart's valves
Right coronary artery
Left coronary artery
Coronary sinus
Great cardiac vein
Middle cardiac vein
Sinuatrial node
Atrioventricular node
Atrioventricular bundle
Right and left bundles
Purkinji fibers
Cardiac plexus
Pulmonary circulation
Systemic circulation
Fetal circulation
Remnants of the fetal circulation
Small cardiac vein
Oblique vein of the left atrium
Anterior cardiac veins
Smallest cardiac veins
Demonstrate the surface markings of the heart and great vessels.
Identify the major anatomical features of each chamber of the heart and explain their functional significance.
Describe the structure and position of the atrio-ventricular, pulmonary and aortic valves and describe their role in the prevention of reflux of blood.
Describe the origin, course and main branches of the left and right coronary arteries and discuss the functional consequences of their obstruction.
Understand the anatomical course of the spread of excitation through the chambers of the heart and describe the placement of ECG electrodes for its clinical assessment.
Demonstrate the arrangement of the fibrous and serous layers of the pericardium in relation to cardiac tamponade.
Demonstrate the surface markings of the heart and the position and site of auscultation of the four major valves.
Identify major structures on standard diagnostic images and be able to recognise common abnormalities.

7. PLEURA. LUNGS. TRACHEOBRACHIAL TREE. FETAL CIRCULATION. REMNANTS OF THE FETAL CIRCULATION.
Trachea

Parietal and visceral pleura
Lungs
Tracheobronchial tree
Pulmonary trunk
Right and left pulmonary arteries
Pulmonary veins
Lymphatic drainage of the lungs
Nerves of the lungs
Bronchial arteries
Bronchial veins
Demonstrate the surface markings of the margins of the pleura and the lobes and fissures of the lungs.
Summarise the anatomy of the bronchial tree and bronchopulmonary segments; explain their functional significance in relation to inhalation injury.
Describe the blood and nerve supply and lymph drainage of the lungs. Describe the structures in the hilum and the mediastinal relations of each lung.
Describe the course and major relations of the thoracic duct and the other lymph systems within the thorax, and explain their medical significance.
Demonstrate the surface projections of the margins of the pleura and the lobes and fissures of the lungs.
Identify major thoracic structures on standard diagnostic images and be able to recognise common abnormalities.

8. MEDIASTINUM PART I.
Mediastinum
Right and left brachiocephalic veins
Superior vena cava
Aorta
Brachiocephalic trunk
Right and left common carotid arteries
Right and left subclavian arteries
Describe the arrangement and contents of the superior, anterior, middle and posterior parts of the mediastinum.
Describe the course of the ascending aorta, the arch of the aorta and the descending thoracic aorta. Name their major branches and the structures they supply.
Describe the origins, course and relationships of the brachiocephalic veins, inferior and superior venae cavae and the azygos venous system.
Describe the origin, course and distribution of the vagus nerve and its branches and the phrenic nerves on both the right and left sides of the thorax. Explain the mechanism of referred pain and where pain is referred from thoracic organs.
Identify major mediastinum structures on standard diagnostic images and be able to recognise common abnormalities.

9. MEDIASTINUM PART II.
Mediastinum
Vagus nerves
Phrenic nerves
Esophagus
Thoracic duct
Lymphatic trunks in the thorax
Azygos vein
Thoracic sympathetic trunk
Thymus
Hemiazygos vein
Accessory hemiazygos vein
Describe the arrangement and contents of the superior, anterior, middle and posterior parts of the mediastinum.
Describe the origin, course and distribution of the vagus nerve and its branches and the phrenic nerves on both the right and left sides of the thorax. Explain the mechanism of referred pain and where pain is referred from thoracic organs.
Describe the composition and function of the sympathetic chains and splanchnic nerves. Describe their composition and function.
Describe the course and major relations of the oesophagus within the thorax.

Describe the composition and function of the sympathetic chains and splanchnic nerves. Describe their composition and function.
Identify major mediastinum structures on standard diagnostic images and be able to recognise common abnormalities.

10. THORAX – VASCULAR AND NERVOUS SYSTEM.

11. BONES AND JOINTS OF THE UPPER LIMB.
Clavicle
Scapula
Humerus
Radius
Ulna
Carpal bones
Metacarpals
Phalanges
Glenohumeral joint
Elbow joint
Wrist joint
Sternoclavicular joint
Acromioclavicular joint
Proximal and distal radio-ulnar joint
Intercarpal joints
Carpometacarpal joints
Intermetacarpal joints
Metacarpophalangeal joints
Interphalangeal joints
Describe and demonstrate the main anatomical landmarks of the clavicle, scapula, humerus, radius and ulna. Recognise the bones of the wrist and hand and their relative positions.
Describe the close relations of the bones and joints (e.g. bursae, blood vessels, nerves ligaments and tendons), which may be injured by fractures or dislocation and predict what the functional effects of such damage might be.
Describe the factors that contribute to the stability of the shoulder joint and explain the functional and possible pathological consequences of its dislocation.
Describe the anatomy of the elbow joint. Demonstrate the movements of flexion and extension, identify the muscles responsible for these movements and summarise their main attachments and somatic motor nerve supply.
Describe the anatomy of the superior and inferior radio-ulnar joints.
Describe the anatomy of the wrist.
Name and demonstrate the movements of the fingers and thumb.
Describe the position and function of the retinacula of the wrist and the tendon sheaths of the wrist and hand.
Identify those bones that are commonly damaged (scaphoid and lunate) and predict functional impairment following such damage.
Explain carpal tunnel syndrome and the spread of infection in tendon sheaths.
Interpret standard diagnostic images of the upper limb and be able to recognise common abnormalities.

12. PECTORAL REGION. AXILLA.
Pectoralis major and minor muscle
Trapezius muscle
Latissimus dorsi muscle
Axilla
Axillary artery
Axillary vein
Axillary lymph nodes
Scapulohumeral muscles
Subclavius muscle
Levator scapulae muscle
Rhomboids
Describe the origin, course and distribution of the major arteries and their branches that supply the shoulder, arm and forearm in relation to common sites of injury. Explain the importance of anastomoses between branches of these arteries at the shoulder and in the upper limb.

Demonstrate the sites at which pulses in the brachial, radial and ulnar arteries may be located.
Describe the courses of the main veins of the upper limb; classify and contrast the functions of the deep and superficial veins. Identify the common sites of venous access and describe their key anatomical relations.
Describe the boundaries of the axilla. List its contents, including the major vessels, parts of the brachial plexus and lymph node groups.
Describe the movements of the pectoral girdle; identify the muscles responsible for its movements and summarise their main attachments and somatic motor nerve supply.
Describe the anatomy of the axillary lymph nodes and explain their importance in the lymphatic drainage of the breast and the skin of the trunk and upper limb and in the spread of tumours.

13. BRACHIAL PLEXUS.
Brachial plexus
Musculocutaneous nerve
Median nerve
Ulnar nerve
Radial nerve
Axillary nerve
Dorsal scapular nerve
Long thoracic nerve
Suprascapular nerve
Subclavian nerve
Lateral pectoral nerve
Median pectoral nerve
Median cutaneous nerve of arm
Median cutaneous nerve of forearm
Thoracodorsal nerve
Describe the organisation of the brachial plexus, its origin in the neck and continuation to the axilla and upper limb.
Describe the origin, course and function of the axillary, radial, musculocutaneous, median and ulnar nerves in the arm, forearm, wrist and hand. Name the main muscles and muscle groups that these nerves supply as well as their sensory distribution.
Demonstrate how to test for motor and sensory nerve function. Describe the anatomical basis of: the assessment of cutaneous sensation in the dermatomes of the upper limb, tendon jerk testing of biceps and triceps and comparative strength tests.
Explain the loss of function resulting from injuries to the different parts of the brachial plexus.
Explain why and describe where the axillary, musculocutaneous, radial, median and ulnar nerves are commonly injured and be able to describe the functional consequences of these injuries.
Predict the consequences of injury to the axillary, radial, musculocutaneous, median and ulnar nerves in the arm, forearm, wrist and hand and describe how to test their functional integrity.

14. ARM. FOREARM.
Biceps brachii
Triceps brachii
Brachial artery
Cephalic vein
Basilic vein
Flexor digitorum profundus
Flexor digitorum superficialis
Corcobrachialis muscle
Brachialis
Anconeus
Flexor-pronator compartment muscles of forearm
Extensor-supinator compartment muscles of forearm
Describe the fascial compartments delimiting the major muscle groups of the upper limb. Explain the functional importance of those compartments and their contents.
Explain the relationship between venous and lymphatic drainage channels.
Interpret standard diagnostic images of the upper limb and be able to recognise common abnormalities.
The anatomy of the elbow joint - demonstrate the movements of flexion and extension, identify the muscles responsible for these movements and summarise their main attachments and somatic motor nerve supply.
Explain the movements of supination and pronation; identify the muscles responsible for these movements and

summarise their main attachments and somatic motor nerve supply.

15. HAND. UPPER LIMB – VASCULAR & NERVOUS.

Fascia and compartments of palm
Muscles of hand
Long flexor tendons and tendon sheaths in hand
Arteries and veins of hand
Deep palmar arch
Superficial palmar arch
Nerves of hand
Palmar aponeurosis
Thenar muscles
Hypothenar muscles
Short muscles of hand
Describe and demonstrate movements at the wrist joint and name and identify the muscle groups responsible for the movements. Describe the relative positions of the tendons, vessels and nerves at the wrist in relation to injuries.
Explain carpal tunnel syndrome and the spread of infection in tendon sheaths.
Name and demonstrate the movements of the fingers and thumb. Describe the position, function and nerve supply of the muscles and tendons involved in these movements, differentiating between those in the forearm and those intrinsic to the hand.
Explain the main types of grip (power, precision and hook) and the role of the muscles and nerves involved in executing them.
Identify major hand structures on standard diagnostic images and be able to recognise common abnormalities.

16. AUTONOMIC NERVOUS SYSTEM. GENERAL DESCRIPTION OF HUMAN'S BRAIN. VENTRICLES.

Overview of the Autonomic Nervous System (ANS)
Pre- and post-ganglionic sympathetic neurons
Pre- and post-ganglionic parasympathetic neurons
Neural ganglia
Sympathetic (thoracolumbar) division of the ANS
Parasympathetic (craniosacral) division of the ANS
Functions of divisions of the ANS
Visceral sensation
Parts of the brain
Anatomical planes
Basic anatomy of the ventricles
Brain dimensions and weight
Lateral ventricles and their horns.
Third ventricle
Fourth ventricle
Cerebrospinal fluid
Evan's index
Kocher's point
Identify the difference between the somatic and autonomic nervous systems in relation to their function, target organs, anatomy and neurotransmitters.
Explain the meaning of the term "ganglion" and point out the most important ganglia of the ANS.
Describe the two main ANS divisions: parasympathetic and sympathetic. Compare both according to number of neurons involved, location of neural ganglia, length of neural axons and pre and postganglionic neurotransmitters involved in neural impulse conduction.
Locate the nuclei of both sympathetic and parasympathetic neurons and identify the way their axons use to reach the target organ.
Describe the effect of both divisions of the ANS on target organs. Pinpoint the organs innervated by both divisions and those which are innervated exclusively by one. Explain why the effect of sympathetic stimulation is called "flight or fight" and parasympathetic as "rest and digest" type of response.
Explain the meaning of pre- and paravertebral ganglia.
Describe the anatomy of the sympathetic trunk and its location in relation to the vertebral column. Indicate the ways that preganglionic fibers use to synapse on the sympathetic trunk. Define the term splanchnic and name the most important splanchnic nerves and their functions.

Elaborate on grey and white *rami communicantes* and explain their function and point out what kind of neurons they do contain.
Name all the parasympathetic ganglia of the cranium and clarify their connection with the cranial nerves.
Explain the meaning of following terms: intermediolateral and intermediomedial cell columns.
Identify the possible level of lesions lying behind Horner's syndrome and describe its clinical presentation.
Explain the background of Hirschprung's disease etiology and its connection to parasympathetic nervous system.
Identify major planes used to describe the brain's anatomy.
Identify the major divisions of the brain: the cerebral hemispheres, diencephalon, midbrain, pons, medulla oblongata and cerebellum.
Name and locate all the ventricles within the cerebrum. State brain's general features, including its weight and diameters.
Indicate the general anatomy of lateral ventricles mentioning its horns and their topography.
Describe the anatomical localization of the third ventricle and name its connections with lateral and fourth ventricles.
Describe the function of choroid plexus and indicate in which particular places in ventricular system are they located.
Specify the position of the fourth ventricle in relation to brainstem and cerebellum. Point out its important anatomical findings. Pinpoint areas where the cerebrospinal fluid exits the ventricular system in order to move to the cerebral cisterns. List the most important cerebral cisterns.
Elaborate on CSF mentioning its physical properties, features, function and circulation.
Describe the clinical outcome of impairment of the CSF's circulation. Divide hydrocephalus into communicating and non-communicating and explain the difference. Provide examples for both.
Indicate the radiological findings of hydrocephalus on MRI mentioning significance of Evan's index.
Discuss potential methods for treatment of hydrocephalus. Explain the method of ventriculoperitoneal shunt and the localization of Kocher's point.
Horner's syndrome
Autonomic neuropathy
Hirschprung's disease
Communicating hydrocephalus
Non – communicating
hydrocephalus
Ventriculoperitoneal shunt

17. MEDULLA OBLONGATA. PONS. MIDBRAIN CRANIAL NERVES III, IV, V, VI, VII, VIII, IX, X, XI, XII (REVIEW).
External anatomy of the medulla oblongata: dorsal and ventral surfaces
External anatomy of the pons: dorsal and ventral surfaces
Rhomboid fossa
Internal anatomy of the medulla oblongata and the pons
Decussation of the pyramids
Fasciculi and nuclei: cuneatus and gracilis
Important nuclei of medulla oblongata and the pons
Formatio reticularis; *lemniscus medialis and lemniscus lateralis*
Midbrain: general features
External anatomy of the midbrain
Ventral surface: *crura cerebri, fossa interpeduncularis, substantia perforata posterior*
Dorsal surface: *lamina tecti*, superior and inferior colliculi, *trigonum lemnisci*
Aqueductus cerebri
Internal anatomy of the midbrain: crus cerebri, substantia nigra, *substantia grisea centralis*, tegmentum and tectum of the midbrain. *Formatio reticularis*, red nucleus.
Nuclei and exit routes of cranial nerves III, IV, V, VI, VII, VIII, IX, X, XI and XII
Nuclei and exit route of cranial nerves III and IV and mesencephalic nucleus of n. V.
Describe external anatomy of the medulla oblongata – ventral as well as dorsal sides. Locate important ventral structures such as: olives, pyramids, decussation of the pyramids, anterior median fissure, *foramen caecum*, lateral anterior sulcus and routes of exit for appropriate cranial nerves. Point out dorsal anatomical structures including *tuber cinereum* and fasciculi and tuberculi for both fasciculus and cuneatus nuclei.
Describe the external anatomy of the pons – ventral as well as dorsal sides. Locate *sulcus basilaris*, pyramidal eminence and medial cerebellar peduncles. Point out the exit routes for nerves V, VI, VII and VIII.
Interpret anatomy of rhomboid fossa and explain its conjunction to the fourth ventricle. Name and locate its most important features and anatomical structures such as: *colliculus facialis, trigonum n. XII, trigonum n. X, obex, area postrema, area vestibularis, locus coeruleus, sulcus medianus* and *stria medullares* of the fourth ventricle.

Describe the internal anatomy of both medulla oblongata and the pons. Locate the decussation of the pyramids on a transverse plane. Name most important structures lying in anterior horn, such as *nucleus supraspinatus* and *nucleus ambiguous*. Locate nuclei of cranial nerves XII, X and *nucleus solitarius.*
Describe structures present in the posterior horn of medulla oblongata such as spinal nucleus of n. V and spinal tract of n. V. Mark *fasciculus gracilis* and *fasciculus cuneatus* and their nuclei on a transverse plane. Locate connected with them medial lemnisci and their decussations. Point pyramids, external arcuate fibers, arcuate nuclei and olive nuclei. Identify accessory cuneate nucleus, vestibular nuclei and cochlear nuclei.
Explain the significance and anatomy of the reticular formation. Discuss the clinical outcome of its impairment.
Localize respiratory and cardiac centers within the brainstem and explain the role of the medulla oblongata in death pronouncement.
Define the term "herniation" and discuss possible causes of tonsillar herniation and its clinical outcome.
Describe the midbrain's general features and its location in relation to the tentorial notch, cerebellar hemispheres and cerebellum.
Describe the midbrain's external anatomy localizing: *crura cerebri, fossa interpeduncularis, substantia perforata posterior, lamina tecti*, superior and inferior colliculi and *trigonum lemnisci.*
Locate the cerebral aqueductus and indicate its role in CSF's circulation.
Divide the midbrain's transverse anatomy into tectum and cerebral peduncles and list subdivisions of the latter.
Mention neural pathways located in *crus cerebri.* Demonstrate structures which belong to the midbrain's tegmentum and describe their function.
List most important structures of the midbrain's tectum.
Locate the nuclei and exit routes of cranial nerves III and IV and the mesencephalic nucleus of n. V.
Tonsillar herniation
Respiratory and cardiac centers
Death pronouncement

18. DIENCEPHALON. PITUITARY GLAND. TELENCEPHALON. CEREBRAL CORTEX. CRANIAL NERVE II (REVIEW).
General features
Parts of diencephalon
External anatomy of diencephalon
Ventral surface: mammillary body, *tuber cinereum*, hypophysis, optic chiasm.
Dorsal surface: *stria medullaris thalami, taenia thalami, stria terminalis, lamina affixa, corpus geniculatum mediale* and *laterale, trigonum hebanulae* and pineal body
Internal anatomy of the third ventricle
Thalamus and its nuclei
Functions of the thalamus
Epithalamus
Hypothalamus and its function
Subthalamus
Cranial nerve II (review)
Telencephalon medium (impar): *area praeoptica, lamina terminalis* and brain commissures
Cerebral hemispheres
External surface of cerebral hemispheres: sulci, gyri, poles and lobes
Central sulcus and lateral sulcus
Insula
Lateral ventricles – review
Internal structure of telencephalon
Cerebral cortex and Brodmann areas; motor and somatosensory homunculus
Olfactory bulb
White matter of hemispheres: *centrum semiovale, corona radiata*, internal, external and extreme capsules.
Characterize the general features and location of the diencephalon. List its major parts: *thalamus, epithalamus, hypothalamus and subthalamus.*
Describe the external anatomy of the diencephalon and locate its most important structures like: mammillary bodies, *tuber cinereum* and optic chiasm. Explain the relation of hypophysis with diencephalon.
Enlist the structures composing the dorsal surface of the diencephalon: *stria medullaris thalami, taenia thalami, stria terminalis, lamina affixa*, lateral and medial geniculate bodies, *trigonum hebanulae* and pineal body and indicate them on sagittal, coronal and transverse planes.
Review the topography of the third ventricle in relation to the parts of the diencephalon. Mention which structures compose its lateral, anterior, posterior, inferior and superior walls.

Describe the topography of the thalamus and list its nuclei. Explain their function and affiliation to ascending and descending neural tracts.
Expound anatomy of the epithalamus and locate its structures on appropriate planes. Mention the location and the function of *trigonum habenule*, habenular commissure, posterior commissure and the pineal body.
Describe the function of the hypothalamus and its role in the endocrine and autonomic systems. Depict all major nuclei: *supraopticus, paraventricularis, suprachiasmaticus, infindibuli, tuberomamillaris*, lateral and medial mammillary.
Describe the anatomical topography of the subthalamus and its major components: *nucleus subthalamicus, zona incerta* and *nucleus campi Foreli.*
Explain the diencephalon's role in neurosecretion, termoregulation, regulation of food and water intake, regulation of sexual activity, emotions and also sleep and awake states.
Describe the anatomical location of the pituitary gland, its function and blood supply.
List the most common pituitary tumors and their clinical presentation. Review the optic tract and connect possible levels of lesions with their appropriate sight impairments.
Explain the term "thalamic pain" and present its cause, presentation, diagnosis and treatment.
Divide the telencephalon into two subdivisions: telencephalon medium and cerebral hemispheres.
Enlist the structures which belong to telencephalon medium: *area praeoptica, lamina terminalis* and *telencephalic comissures (commisura anterior, corpus callosum* and *comissura fornicis)*
Describe the anatomy and function of the *corpus callosum.*
Describe the external surface of the cerebrum localizing its frontal, occipital and temporal poles as well as its frontal, parietal, occipital and temporal lobes.
Define terms such as gyrus and sulcus and explain the reason the human brain is organized in such matter.
Pinpoint the location of the longitudinal fissure as well as the central, lateral and postcalcarine sulci. Name the gyri adjacent to the central sulcus and explain their clinical importance.
Find on the lateral and medial surface of human brain Brodmann areas 1, 2, 3, 4, 17, 22, 39, 40, 44 and 45 and explain their significance.
Describe the motor and somatosensory homunculus and translate their significance to impairment of certain cortical areas.
Locate insula in relation to the temporal, parietal and frontal lobes and to the lateral sulcus. Indicate its function.
Describe the continuity of white matter of the human brain. Point out localization of centrum semiovale, *corona radiata,* internal, external and extreme capsules.
Depict in detail the anatomy of the internal capsule and enlist the different type of fibers composing it.
Explain the term and clinical significance of: increased intracranial pressure and midline shift. Give examples of possible causes of both.
Pituitary function
Pituitary tumors
Pineal body function
Bitemporal hemanopsia
Brain tumors – glioblastoma
Increased ICP

19. LIMBIC SYSTEM; MENINGES OF THE BRAIN. BASAL GANGLIA. CRANIAL NERVE I (REVIEW).
Limbic lobe: cingular gyrus, parahippocampal gyrus, area subcallosa and hippocampus.
Hippocampal connections
Mammillary bodies
Fornix
Amygdala
Papez circuit
V Dura mater
Dural infoldings: *falx cerebri, falx cerebelli, diaphragma sellae* and *tentorium cerebelli.*
Arachnoid mater
Pia mater
Dural sinuses
Arachnoid granulation
Circulation of the CSF
Cranial nerve I (review)
Extrapyramidal system and basal nuclei: *globus pallidus, putamen*, caudate nucleus, *claustrum*;
List the parts of the limbic lobe and explain their functions: cingular and parahipoccampal gyri, *area subcallosa* and hippocampus.

Describe the principal components of the limbic system (hippocampus, amygdala, prefrontal cortex, *nucleus accumbens*, fornix), the pathways connecting them and their function.
Define the term "Papez circuit" and enlist its connections and clinical role.
Discuss the role of limbic system involved in motivation, emotion, learning, and memory.
Explain the manifestations of related disorders – Alzheimer's disease and Korsakoff syndrome.
Reviews the topographic anatomy of the cranial nerve I and the function of olfactory bulb of the limbic system.
Describe the role of dura, arachnoid and pia matter in the human brain. List the known dura infoldings and explain their significance. Locate the epidural, subdural and subarachnoid space and explain their role as possible sites for blood accumulation. Name the possible causes of subdural and epidural hematomas and subarachnoid haemorrhage.
Describe the symptoms, causes and diagnosis of meningitis.
List all the basal ganglia and explain their function. Indicate which belong to the telencephalon, diencephalon or midbrain's part of the human brain.
Describe the detailed anatomy of caudate and lenticular nuclei. Discuss their clinical significance and give examples of diseases affecting certain nuclei. Explain the possible treatment for patients with Parkinson's disease and discuss novel neurosurgical approaches with deep brain stimulation.
Review the topography of the lateral ventricles in relation to cerebral lobes, basal ganglia and other anatomical structures.

20. THE CEREBELLUM. BRAIN'S BLOOD SUPPLY.

Location of the cerebellum
External surface of the cerebellum
Lobes: anterior, posterior and flocclounodular
Longitudinal zones
Fissures
Cerebellar peduncles
Cerebellar nuclei
Internal organization
Cerebellar cortex
Purkinje, granule, basket cells
Climbing and mossy fibers
Functions of the cerebellum
Cerebellar dysfunction
Vertebral and basal arteries and their branches
Internal carotid arteries and their branches
Circle of Willis
Arteries supplying medulla oblongata and the pons
Arteries supplying cerebellum
Arteries supplying the midbrain
Arteries supplying diencephalon
Arteries supplying telencephalon
Profound veins of the brain: cerebral internal vein, vena cerebri magna
Superficial veins of the brain: superior, inferior and anastomotic (Labbe and Trolard's) veins.
Basal vein
Cerebellar veins
Circulation of the CSF (review)
Describe the anatomical location of the cerebellum in relation to tentorium cerebelli, cranial fossae and the brainstem.
Describe the superior and inferior external surfaces of the cerebellum naming most important anatomical structures: primary fissure, horizontal fissure, *valecula cerebelli.*
Name cerebellar lobes (anterior, posterior and flocullonodular) and its longitudinal zones (*vermis, paravermis* and cerebellar hemispheres). Indicate their function.
Identify lobuli of the vermis and the cerebellar hemispheres.
Describe cerebellar peduncles (superior, middle and inferior) and mention the type of fibers they contain. Indicate the origin and destination of aforementioned neurons.
Describe the internal anatomy of the cerebellum. Indicate the layers of cerebellar cortex: molecular, Purkinje cell and granular layers. Define the typical cells which compose each of them.
Enlist cerebellar nuclei and their connections to other structures. Describe their function.
List general functions of the cerebellum and compare them to the functions of the basal nuclei and the cerebral cortex.
Indicate clinical presentation of the cerebellar dysfunction: motor symptoms, occulomotor, stance and gait

disturbances and speech impairment. Provide examples of such.
Exmplain the nature of the Dandy - Walker syndrome.
Describe the origin, course, main branches and function of the arteries supplying the spinal cord. Elaborate on spinal branches of various arteries (and their anterior and posterior radicular branches) and on the spinal arteries (anterior and posterior). Describe the function and origin of intramedullary arterial branches (*rami centrales and rami peripherales*) and of the artery of Adamkiewicz.
Indicate the most important spinal cord veins: internal and external spinal veins, anterior and posterior radicular veins and *vena radicularis magna.*
Enlist major arteries supplying the brain and identify their main branches.
Describe the origin, course, main branches and function of the vertebral, basal and internal carotid arteries.
Explain the function and anatomy of the Circle of Willis.
Enlist major arteries supplying medulla oblongata and the pons (paramedian, lateral and posterior arteries). Name their place of origin.
Enlist major arteries supplying cerebellum (posterior and anterior inferior cerebellar artery, superior cerebellar artery and tonsillar artery). Indicate the arteries from which they receive blood supply.
Describe the blood supply to the midbrain and diencephalon.
Describe the blood supply to the telencephalon. Divide the distribution areas into the area of medial branches and the area of cortical branches.
Describe the origin, course, main branches, function and termination of the major profound (internal veins and great cerebral vein) and superficial veins (superior, inferior and anastomotic: Labbe and Trolards veins).
Depict the topography of the basilar vein.
Summarize the blood supply to the cerebellum.
Review the circulation of the cerebrospinal fluid. Extend the description to the CSF cisterns, dural sinuses and cerebral veins.
Explain the cause, diagnosis, clinical finding and treatment of both ischemic and haemorrhagic strokes.
Indicate the pathophysiology, diagnosis and clinical presentation of a subarachnoid haemorrhage and brain aneurysms.
Explain the pathophysiology lying behind arteriovenous malformation. Discuss the possible ways of treatment.
Motor symptoms of cerebellar damage
Occulomotor disturbances
Stance and gait disturbances
Cerebellar speech impairment
Ischemic stroke
Haemorrhagic stroke
Brain aneurysms
AVM – Arteriovenous malformation

21. THE SPINAL CORD. ASCENDING AND DESCENDING PATHWAYS
Spinal cord – general features: composure, length, place of origin and termination location.
Cervical and lumbar enlargements
Cauda equina, conus medullaris and *filum terminale*
Segmental organization of the spinal cord
Spinal nerve anatomy and spinal ganglion
Dermatomes
Internal structure of the spinal cord
Spinal cord nuclei and laminae
Spinal canal anatomy
Spinal cords meninges
Blood supply to the spinal cord
Terminology: funiculus, fasciculus, tract, and pathway.
Ascending tracts:
- spinothalamic tract: lateral and anterior
- spinobulbar tract: fasciculus gracilis and fasciculus cuneatus
- spinocerebellar tract: anterior and posterior

Descending tracts:
- corticospinal tract: anterior and lateral; corticobulbar tract
- rubrospinal tract
- tectospinal tract
- reticulospinal tract

- vestibulospinal tract
- olivospinal tract

Cerebellar internal tracts:
Connections between cerebellar cortex and cerebellar nuclei, internuclear connections, intracortical connections
Cerebellar external tracts: ascending and descending.
Describe the spinal cord's cervical, thoracic, lumbar and sacral segments. Explain the terms: *cauda equina, conus medullaris and filum terminale.* Locate the level at which the spinal cord terminates as well as the level where lumbar puncture is usually performed.
Explain the reason of the presence of the cervical and lumbar enlargements.
Demonstrate the anatomy of the spinal nerve and its exit route from the vertebral canal. Point out the function of ventral and dorsal roots. Explain anatomy and connections of the spinal ganglion. Define the term dermatome and its clinical correlation to radicular pain syndrome.
Recall the anatomy of vertebral column in relation to the spinal cord and figure the clinical outcome of an intervertebral disc herniation and spinal stenosis.
Describe the anatomy of the spinal cord in a transverse plane. Explain the function of the white and grey matter of the spinal cord. Point out the differences in grey matter according to appropriate levels.
Name most important nuclei and laminae of the spinal cord and explain the clinical outcome of poliomyelitis and amyotrophic lateral sclerosis.
Indicate the role of myelin in electric impulse conduction and explain the etiology and consequences of demyelinating process in Multiple Sclerosis.
Name the meninges that invaginate the spinal cord.
Describe the blood supply to the spinal cord. Name the most important vessels and their places of origin, courses, main branches and areas of supply.
Explain the following terms: funiculus, fasciculus, tract and pathway.
Describe the course, anatomical location (in appropriate levels of the CNS), function and dysfunction of the major ascending neural tracts: spinothalamic tract (lateral and anterior), spinobulbar tract (fasciculus gracilis and fasciculus cuneatus) and spinocerebellar tract (anterior and posterior)
Describe the course and anatomical location (in appropriate levels of the CNS) of the major descending neural tracts: corticospinal tract (anterior and lateral), corticobulbar tract, rubrospinal tract, tectospinal tract, reticulospinal tract, vestibulospinal tract and olivospinal tract.
Summarize the spinal cord's internal tracts and their role in spinal reflexes.
Describe the cerebellar internal tracts and their origin, destination, course, function and dysfunction.
Enlist and elaborate on the cerebellar connections between the cerebellar cortex and the cerebellar nuclei, internuclear connections and intracortical connections.
Describe the most important cerebellar external tracts: ascending (vestibulocerebellar, spinocerebellar, nucleocerebellar, pontocerebellar and olivocerebellar tract) and descending (fasciculi cerebellobulbares and superior cerebellar peduncle).
Elaborate on the upper motor neuron lesion and compare it with the lower motor neuron lesion.
Enlist the clinical findings in a subject with posterior column ataxia.
Explain the term "dissociated sensory loss" and figure the possible causes of this condition.
Intervertebral disc herniation
Poliomyelitis
Radiculopathy
MS - Multiple sclerosis
ALS - Amyotrophic lateral
sclerosis
Lumbar punction
Upper motor neuron lesion (neurologic examination)
Posterior column ataxia
Dissociated sensory loss

22. SKULL PART I – NEUROCRANIUM AND VISCEROCRANIUM.

Bones:
Ethmoid
Frontal
Inferior conchae
Lacrimal
Mandible
Maxilla

Nasal
Parietal
Sphenoid
Temporal
Vomer
Zygomatic
Foramina and apertures of the cranium
Coronal suture
Sagittal suture
Lambdoid suture
Facial aspect of cranium
Lateral aspect of cranium
Craniometric points of cranium
Occipital aspect of cranium
Superior aspect of cranium
External surface of cranial base
Internal surface of cranial base
Foramina and other apertures of cranial fossae and contents
Walls of cranial cavity

Demonstrate the position, palpable and imaging landmarks of the major bones of the skull, including the frontal, parietal, occipital, temporal, maxilla, zygoma, mandible, sphenoid, nasal and ethmoid bones. Demonstrate the major sutural joints and describe the fontanelles of the fetal skull.
Describe the boundaries, walls and floors of the cranial fossae.
Identify the external and internal features of the cranial foraminae and list the structures that each transmits.
Identify major skull structures on standard diagnostic images and be able to recognise common abnormalities.

23. SKULL PART II – NEUROCRANIUM AND VISCEROCRANIUM.
Bones:
Ethmoid
Frontal
Inferior conchae
Lacrimal
Mandible
Maxilla
Nasal
Parietal
Sphenoid
Temporal
Vomer
Zygomatic
Foramina and apertures of the cranium
Coronal suture
Sagittal suture
Lambdoid suture
Facial aspect of cranium
Lateral aspect of cranium
Craniometric points of cranium
Occipital aspect of cranium
Superior aspect of cranium
External surface of cranial base
Internal surface of cranial base
Foramina and other apertures of cranial fossae and contents
Walls of cranial cavity
Demonstrate the position, palpable and imaging landmarks of the major bones of the skull, including the frontal, parietal, occipital, temporal, maxilla, zygoma, mandible, sphenoid, nasal and ethmoid bones. Demonstrate the major sutural joints and describe the fontanelles of the fetal skull.
Describe the boundaries, walls and floors of the cranial fossae.
Identify the external and internal features of the cranial foraminae and list the structures that each transmits.

Identify major skull structures on standard diagnostic images and be able to recognise common abnormalities.

24. FACE. CN VII. NOSE. CN I. PARANASAL SINUSES. CN V2.

Facial nerve
Facial artery
Facial vein
External nose
Nasal septum
Nasal cavities
Olfactory nerve
Frontal sinuses
Ethmoidal cells
Sphenoidal sinuses
Maxillary sinuses
Trigeminal nerve – Maxillary nerve V2
Muscles of face
Lymph nodes of face
Vessels and nerves of the nose
Describe the anatomy of the scalp, naming its individual layers. Describe the blood supply of the scalp and its significance in laceration injuries.
Describe the intracranial and intrapetrous course of the facial nerve and the relationships of its major branches to the middle ear in relation to damage of the nerve within the facial canal.
Demonstrate the extracranial course of the branches of the facial nerve. Summarise the muscles of facial expression supplied by each branch and describe the consequences of injury to each branch.
Describe the origins and summarise the courses and major branches of the facial, including the course and intracranial relations of the middle meningeal artery and its significance in extradural haemorrhage.
Describe the anatomy of the motor and sensory nerves to the head and apply this to a basic neurological assessment of the cranial nerves and upper cervical spinal nerves.
Describe the relationship of the termination of the facial vein (draining into the internal jugular vein) and the mandibular branch of the retromandibular vein (supplying facial muscles controlling the angle of the mouth) to the submandibular gland and related upper jugular lymph nodes in relation to exploration of this area.
Describe the arrangement of the lymphatic drainage of the head, the major groups of lymph nodes and the potential routes for the spread of infection and malignant disease.
Interpret standard diagnostic images of the head and be able to recognise common abnormalities.
Describe the bones of the nasal cavity and the major features of the lateral wall of the nasal cavity. Describe the major arteries that supply the lateral wall and nasal septum in relation to nosebleeds.
Name the paranasal sinuses, describe their relationships to the nasal cavities and sites of drainage on its lateral wall and explain their innervation in relation to referred pain.
Describe the arrangement of the venous sinuses of the cranial cavity; explain the entrance of cerebral veins into the superior sagittal sinus in relation to subdural haemorrhage, and how connections between sinuses and extracranial veins may permit intracranial infection.
Identify major nose and paranasal sinuses structures on standard diagnostic images and be able to recognise common abnormalities.

25. EYE. CN II, III, IV, VI, CN V1.

Orbit
Eyeball
Optic nerve
Oculomotor nerve
Trochlear nerve Abducent nerve
Trigeminal nerve – Ophtalmic nerve V1
Eyelids
Lacrimal aparatus
Eye muscles:
Superior oblique
Inferior oblique
Superior rectus
Inferior rectus
Lateral rectus

Medial rectus
Ophthalmic artery
Describe the walls and the key anatomical relations of the orbits.
Describe the location, actions and nerve supply of the intrinsic and extra-ocular muscles and apply this knowledge to explain the consequences of injury to the nerve supply of these muscles.
Describe the anatomy of the eyelids, conjunctiva and lacrimal glands. Explain their importance for the maintenance of corneal integrity.
Describe the anatomy of the three layers of the eyeball.
Describe the refractive media and compartments of eyeball.
Describe the vasculature of the orbit.
Describe the sympathetic innervation of the head and the features and casual lesions in Horner's syndrome.
Identify major orbit structures on standard diagnostic images and be able to recognise common abnormalities.

26. EAR. CN VIII.
Auricle
External acoustic meatus
Tympanic membrane
Tympanic cavity
Pharyngotympanic tube
Malleus
Incus
Stapes
Bony labyrinth
Membranous labyrinth
Internal acoustic meatus
Vestibulocochlear nerve
Describe the functional anatomy of the external auditory meatus, tympanic membrane, ear ossicles and auditory tube, together with their major anatomical relations.
Describe the walls of the tympanic cavity.
Describe the pharyngotympanic tube and the auditory ossicles.
Describe the functional anatomy of the bony labyrinth and the membranous labyrinth.
Demonstrate the origin and course of the vestibulocochlear nerve.
Identify major ear structures on standard diagnostic images and be able to recognise common abnormalities.

27. PAROTID GLAND. PTERYGOPALATINE FOSSA.
Parotid region
Parotid gland
Parotid duct
Pterygopalatine fossa
Innervation of parotid gland and related structures Temporal muscle
Masseter
Medial and lateral pterygoid muscles
Muscles of mastication
Describe the key anatomical relations of the parotid gland, the course of their ducts into the oral cavity and their autonomic secretomotor innervation.
Interpret standard diagnostic images of the head and be able to recognise common abnormalities.
Describe the innervation of parotid gland and related structures.
Describe the course of the parotid duct.
Describe the boundaries of the pterygopalatine fossa. Identify the features of the pterygopalatine foramina and list the structures that each transmits. Describe the anatomy of the pterygopalatine fossa, its openings.

28. ORAL REGION. TEMPOROMANDIBULAR JOINT. CN IX, X, XII. CN V3.
Teeth
Hard palate
Soft palate
Tongue
Submandibular glands
Sublingual glands
Glossopharyngeal nerve

Vagus nerve
Hypoglossal nerve
Temporomandibular joint
Trigeminal nerve – Mandibular nerve V3
Temporal region
Infratemporal region
Lips
Cheeks
Muscles of tongue
Maxillary artery
Neurovasculature of infratemporal fossa
Demonstrate the major features and boundaries of the oral cavity and summarise its sensory innervation.
Describe the functional anatomy of the tongue, including its motor and sensory innervation and the role of the extrinsic and intrinsic muscles. Explain the deviation of the tongue after hypoglossal nerve injuries.
Describe the surfaces of the teeth.
Describe the innervation of the mouth and teeth.
Describe the key anatomical relations of the submandibular and sublingual salivary glands, the course of their ducts into the oral cavity and their autonomic secretomotor innervation. Appreciate the narrow points of the ducts in relation to salivary stone impaction.
Describe the origins and summarise the courses and major branches of the maxillary arteries, including the course and intracranial relations of the middle meningeal artery and its significance in extradural haemorrhage.
Describe the key anatomical relations and content of the temporal region and infratemporal fossa.
Describe the anatomy of the temporomandibular joint. Explain the movements that occur during chewing and describe the muscles involved including their innervation. Explain what occurs in anterior joint dislocation and relocation.

29. BONES AND JOINTS OF THE NECK. MUSCLES OF THE NECK - SCM. CAROTID TRIANGLE. ENDOCRINE LAYER OF THE CERVICAL VISCERA.
Cervical vertebrae
Hyoid bone
Sternocleidomastoid muscle
Carotid triangle
Common carotid artery
External carotid artery
Internal carotid artery
Internal jugular vein
External jugular vein
Thyroid gland
Parathyroid glands
Platysma
Deep cervical fascia
Triangles of the neck
Root of neck and preverteral muscles
Demonstrate the palpable position of the hyoid bone, thyroid and cricoid cartilages, lateral mass of the atlas and the spine of C7.
Identify the major structures passing between the neck and the thorax. Describe the courses and important relationships of the subclavian arteries and veins.
Demonstrate the positions of the external and internal jugular veins and the surface landmarks that are used when inserting a central venous line.
Describe the hyoid bone and cartilages of the larynx. Explain how these structures are linked together by the thyrohyoid, cricothyroid, and quadrangular membranes.
Describe the boundaries and the contents of the triangles of the neck.
Identify major neck structures on standard diagnostic images and be able to recognise common abnormalities.

30. RESPIRATORY AND ALIMENTARY LAYER OF THE CERVICAL VISCERA. LYMPHATICS OF THE NECK. AUTONOMIC INNERVATION OF THE NECK. CN X AND XI.
Larynx
Trachea
Pharynx

Esophagus
Superficial and deep cervical lymph nodes
Thoracic duct
Vagus nerve
Accessory nerve
Sympathetic trunk – cervical part
Laryngeal muscles
Pharyngeal muscles
Describe the anatomical arrangement and functional significance of the lymphoid tissue in the tonsils, pharyngeal, and posterior nasal walls.
Describe the muscles that compose the pharyngeal walls and move the soft palate; summarise their functions and nerve supply. Describe the components of the gag reflex.
Describe the intrinsic and extrinsic laryngeal muscles responsible for closing the laryngeal inlet, controlling vocal cord position and tension. Explain how these muscles function during phonation, laryngeal closure, the cough reflex and regulation of intrathoracic pressure.
Describe the origin, course and functions of the motor and sensory nerve supply of the larynx and the functional consequences of injury to them.
Describe the stages of swallowing and the functions of the muscles of the jaw, cheek, lips, tongue, soft palate, pharynx, larynx and oesophagus during swallowing.
Demonstrate the position of the anterior and posterior triangles of the neck defined by the sternum, clavicle, mandible, mastoid process, trapezius and sternocleidomastoid.
In the posterior triangle, demonstrate theposition of the spinal accessory nerve, the roots and trunks of the brachial plexus, the external jugular vein and subclavian vessels in relation to penetrating neck trauma.
In the anterior triangle, demonstrate the position of the common, internal and external carotid arteries, the internal jugular vein and vagus nerve, the trachea, thyroid cartilage, larynx, thyroid and parathyroid glands. Explain their significance in relation to carotid insufficiency, central venous line insertion, emergency airway management and diagnosis of thyroid disease.
Describe the location and anatomical relations of the thyroid and parathyroid glands, their blood supply and the significance of the courses of the laryngeal nerves.
Demonstrate the origin, course and major branches of the common, internal and external carotid arteries and locate the carotid pulse.
Describe the courses of the accessory, vagus and phrenic nerves in the neck.
Describe the arrangement of the lymphatic drainage of the neck, the major groups of lymph nodes and the potential routes for the spread of infection and malignant disease.
Describe the sympathetic innervation of the neck and the features.
Describe the anatomy of the motor and sensory nerves to the neck and apply this to a basic neurological assessment of the cranial nerves and upper cervical spinal nerves.
Interpret standard diagnostic images of the neck and be able to recognise common abnormalities.

31. ABDOMINAL CAVITY. ANTEROLATERAL AND POSTERIOR ABDOMINAL WALL. INGUINAL CANAL.

External oblique muscle
Internal oblique muscle
Transversus abdominis
Rectus abdominis
Rectus sheath
Inguinal canal
Spermatic cord
Lymph nodes and vessels of the posterior abdominal wall
Camper fascia
Scarpa fascia
Investing fascia
Transversalis fascia
Parietal peritoneum
Piramidals muscle
Superior epigastric artery
Inferior epigastric artery
Psoas major muscle
Iliacus

Quadratus lumborum
Femoral nerve
Obturator nerve
Genitofemoral nerve
Thoracoabdominal nerves
Subcostal nerve
Iliohypogastric nerve
Ilioinguinal nerve
Musculophrenic artery
Subcostal artery
Deep circumflex artery
Superficial circumflex artery
Superficial epigastric artery
Superficial and deep lymphatic vessesl of the abdominal wall
Lateral cutaneous nerve of the thigh
Accessory obturator nerve
Demonstrate the bony and cartilaginous landmarks visible or palpable on abdominal examination.
Demonstrate the descriptive regions of the abdomen and common incision sites. Demonstrate the surface projections of the abdominal organs.
Demonstrate the points of attachment of the muscles of the abdominal.
Describe the anatomy, innervation and functions of the muscles of the anterior and posterior abdominal walls.
Discuss their functional relationship with the diaphragm and roles in posture, ventilation and voiding of abdominal / thoracic contents.
In relation to direct and indirect inguinal hernias, demonstrate the anatomy of the attachments of the inguinal ligament; the anatomy of the superficial and deep inguinal rings and how the anterior abdominal wall muscles form the inguinal canal. Describe the contents of the inguinal canal in both males and females.
Describe the relationship between the femoral canal and the inguinal ligament and the anatomy of femoral hernias.
Identify major abdominal structures on standard diagnostic images and be able to recognise common abnormalities.

32. PERITONEUM AND PERITONEAL CAVITY. LESSER OMENTUM. ESOPHAGUS. STOMACH. DUODENUM.

Peritoneum and peritoneal cavity
Lesser omentum
Esophagus
Stomach
Duodenum
Celiac trunk
Right and left gastric arteries
Right and left gastro-omental arteries
Posterior gastric artery
Short gastric arteries
Right and left gastric veins
Right and left gastro-omental veins
Anterior and posterior vagal trunks
Prepyloric vein
Explain the nerve supply of the parietal and visceral peritoneum and the role of the visceral peritoneum in referred pain.
Describe the embryology of peritoneal cavity, peritoneal formations and subdivisions of peritoneal cavity.
Demonstrate the positions of the stomach, duodenum.
Describe the organisation of the parietal and visceral peritoneum; its lesser and greater sacs, mesenteries and peritoneal 'ligaments'.
Describe the functional anatomy of the stomach, its position, parts, sphincters, blood and nerve supply and key relations to other abdominal organs.
Describe the duodenum, its parts, position, secondary retroperitoneal attachment, blood supply and key relations with other abdominal organs and their significance in relation to peptic ulcer disease.
Interpret standard diagnostic images of the peritoneum and peritoneal cavity and be able to recognise common abnormalities.

33. SMALL AND LARGE INTESTINE. RECTUM. ABDOMINAL AORTA AND INFERIOR VENA CAVA.

Jejunum
Ileum
Appendix
Cecum
Colon
Rectum
Inferior vena cava
Abdominal aorta
Lumbar plexus
Superior mesenteric artery
Inferior mesenteric artery
Superior mesenteric vein
Inferior mesenteric vein
Demonstrate the positions of the jejunum and ileum of the small intestine, caecum, appendix, ascending, transverse, descending and sigmoid parts of the colon and the rectum.
Explain the significance of the variable attachment of the ascending and descending colon to the posterior abdominal wall.
Summarise the functional anatomy of the small bowel mesentery; its structure, location and vascular, lymphatic and neural content.
Describe the regions of the small and large intestine, including the anatomy of the appendix. Describe the anatomical variations in the position of the appendix and explain their significance in relation to appendicitis.
Describe the origins, course and major branches of the abdominal aorta, coeliac axis, superior and inferior mesenteric arteries and their major branches, the renal and gonadal arteries. Explain the significance of the blood supply from the abdominal aorta to the spinal cord in relation to abdominal aneurysm repair.
Demonstrate the origins, course and major tributaries of the inferior vena cava.
Identify major abdominal structures on standard diagnostic images and be able to recognise common abnormalities.

34. LIVER. PANCREAS. SPLEEN.
Liver
Common bile duct
Pancreas
Portal vein
Spleen
Right and left hepatic bile ducts
Common hepatic bile duct
Cystic duct
Common and proper hepatic artery
Hepatic veins
Pancreatic ducts
Celiac trunk
Superior mesenteric artery
Pancreatico-duodenal arteries
Splenic artery
Splenic vein
Demonstrate the positions of the liver, pancreas and spleen.
Describe the position and form of the liver, the lobes of the liver and their key anatomical relations. Explain the peritoneal reflections of the liver and its movement during respiration. Summarise the functional anatomy of the portal vein, the portal venous system and portal-systemic anastomosis and their significance in portal hypertension.
Describe the position and form of the gall bladder and biliary tree; their relations in the abdomen and the significance of these relations in relation to gall bladder inflammation and biliary stones.
Describe the anatomy of the lymph nodes involved in lymph drainage of abdominal viscera and its significance in relation to spread of malignancy.
Interpret standard diagnostic images of the abdomen and recognise common abnormalities.
Describe the position and form of the pancreas and its relationships to other abdominal organs. Discuss the significance of these relationships in relation to pancreatitis and biliary stone disease.
Describe the position (in relation to the ribs) and form of the spleen in relation to its palpation through the abdominal wall and its key anatomical relationships with other abdominal structures. Explain the significance of these relationships in relation to trauma, chronic infections and disorders of the haematopoetic system.
Interpret standard diagnostic images of the liver and pancreas and be able to recognise common abnormalities.

35. SUPRARENAL GLANDS. KIDNEY. URETERS. URINARY BLADDER.

Suprarenal glands
Kidney
Ureter
Renal arteries
Renal veins
Urinary bladder
Suprarenal arteries
Suprarenal veins
Topography, blood and nerve supply of urinary bladder

Describe the position and form of the kidneys and ureters. Demonstrate their relationships to other abdominal and pelvic structures and discuss the significance of these relations in relation to urinary stones.
Describe the relations of the suprarenal (adrenal) glands and their functional anatomy.
Describe the position and form of the pancreas and its relationships to other abdominal organs. Discuss the significance of these relationships in relation to pancreatitis and biliary stone disease.
Describe the anatomy of the urethra; explain the anatomy of its different part in males and females in relationship to continence and catheterisation.
Describe the innervation of the bladder and its sphincters and the mechanism of micturition.
Identify major kidney and ureters structures on standard diagnostic images and be able to recognise common abnormalities.

36. BONY PELVIS, JOINTS AND LIGAMENTS. WALLS AND FLOOR OF PELVIS. PERINEUM.

Pelvic girdle
Ilium
Ischium
Pubis
Sacrum
Sacroiliac joint
Pubic symphysis
Peritoneum in the pelvis
Pelvic fascia
Lumbosacral joint
Sacrococcygeal joint
Obturator internus muscle
Piriformis muscle
Coccygeus muscle
Levator ani muscle

Recognise the major features and surface landmarks of the pelvis. Demonstrate their palpable and imaging landmarks.
Describe the skeletal and ligamentous components of the pelvis, the anatomy of the pelvic inlet and outlet and recognise their normal orientation. Explain sex differences in pelvic skeletal anatomy and how these change during development.
Demonstrate the palpable anatomical landmarks of the iliac, ischial and pubic bones in the living and on the bones and identify them on medical images.
Describe the functional importance of the pelvic floor musculature, its midline raphé and the structures passing through it in males and females.
Interpret standard diagnostic images of the pelvis and be able to recognise common abnormalities.

37. RECTUM. MALE GENITAL ORGANS. SPERMATOGENESIS. ROUTE OF SPERM.

Rectum
Testis
Epididymis
Spermatic cord
Scrotum
Prostate
Penis
Urethra
Rectal arteries

Rectal veins
Testicular artery
Testicular vein
Deep artery of the penis
Autonomic innervation of the pelvic viscera
Seminal vesicles
Bulbourethral glands
Describe the anatomy of the sigmoid colon and rectum and their anatomical relationships including peritoneal.
Explain the anatomy of the anal canal, the functional anatomy of the anal sphincters and their role in faecal continence.
Describe the blood supply and venous drainage of the distal bowel; the supply from the superior rectal (inferior mesenteric), middle rectal (internal iliac) and inferior rectal arteries (from pudendal to anal canal only), and portal-systemic venous anastomosis. Describe the vascular anal cushions and explain their role in continence.
Describe the anatomy of the ischio-anal fossa and explain its potential involvement in abscesses, anal glands and fissures.
Describe the anatomy of the scrotum, testis, epididymis and their normal features on clinical examination. Explain the significance of their arterial supply in relation to torsion, their venous drainage in relation to varicocoele and their lymphatic drainage in relation to tumour spread.
Describe the structure and course of the spermatic cord and vas deferens.
Describe the anatomy of the prostate gland, seminal vesicles and their anatomical relations. Describe the normal form of the prostate when examined per rectum and changes in relation to hypertrophy and malignancy.
Describe the origin, course and relations of the testicular arteries.
Describe the innervation and mechanisms involved in erection of cavernous tissue in male and female and emission and ejaculation in the male.
Describe the structure of the penis, scrotum and its contents. Describe the arterial supply to and venous drainage from the penis. Explain the anatomy of the perineal membrane and superficial perineal pouch in relation to the accumulation of fluids in the male.
Interpret standard diagnostic images of the pelvis and be able to recognise common abnormalities.

38. FEMALE GENITAL ORGANS. OVARY AND UTERUS. VAGINA. FEMALE EXTERNAL GENITALIA. VASCULAR AND NERVOUS SYSTEM OF PELVIS. SOMATIC AND AUTONOMIC NERVES.

Uterus
Uterine tube
Ovary
Vagina
Common iliac artery
External iliac artery
Internal iliac artery
Common iliac vein
External iliac vein
Internal iliac vein
Autonomic nerves of the pelvic
Autonomic plexuses in the pelvis
Vaginal vestibule
Clitoris
Labia majora
Labia minora
Ligaments, blood and nerve supply of ovary and uterus
Parts, blood and nerve supply of vagina
Common, external and internal iliac arteries and veins
Describe the position and form of the ovary, uterine tubes, uterus, cervix and vagina and their anatomical relationships, including any peritoneal coverings.
Describe the changes that occur in the uterus and cervix with pregnancy.
Describe the anatomy of the bladder, its base and ureteric openings. Explain how its position changes with filling and pregnancy and its relationship to the overlying peritoneum.
Describe the origin, course and relations of the uterine and ovarian arteries.
Describe the origin, course and branches of the pudendal nerves and the sites of nerve block during childbirth.
Describe the structure of the clitoris and vulva.

Describe the lymphatic drainage of the pelvis.
Interpret standard diagnostic images of the pelvis and be able to recognise common abnormalities.

39. BONES AND JOINTS OF THE LOWER LIMB

Hip bone
Femur
Patella
Tibia
Fibula
Tarsal bones
Metatarsal bones
Phalanges
Hip joint
Knee joint
Ankle joint
Tibiofibular joints
Foot joints

Recognise the major features and surface landmarks of the femur, tibia, fibula, ankle and foot. Demonstrate their palpable and imaging landmarks. Appreciate which bones and joints are vulnerable to damage and what the consequences of such damage could be.

Describe the close relations of the bones and joints (e.g. bursae, blood vessels, nerves ligaments and tendons), which may be injured in fractures or dislocations and predict what the functional effects of such damage would be.

Describe the structure and movements of the hip joint. Summarise the muscles responsible for these movements, their innervation and main attachments.

Describe the structures responsible for stability of the hip joint and their relative contribution to maintaining the lower limb in different positions.

Describe the structures at risk from a fracture of the femoral neck or dislocation of the hip and explain the functional consequences of these injuries.

Describe the structure and movements of the knee joint.

Describe the close relations of the knee joint including major bursae and explain which structures may be injured by trauma (including fractures and dislocation) to the knee.

Identify the factors responsible for maintaining the stability of the knee joint. Describe the menisci, ligaments and the locking mechanism close to full extension. Explain the anatomical basis of tests, which assess the integrity of the cruciate ligaments.

Describe the anatomy of the ankle joint. Explain the movements of flexion, extension, plantarflexion, dorsiflexion, inversion and eversion.

Describe the factors responsible for stability of the ankle joint, especially the lateral ligaments, and explain the anatomical basis of "sprain" injuries.

Describe the arches of the foot and the bony, ligamentous and muscular factors that maintain them.

Describe the movements of inversion and eversion at the subtalar joint, the muscles responsible, their innervation and main attachments.

Describe the structures at risk to a fracture of the femoral neck or dislocation of the hip and describe the functional consequences of these conditions.

Interpret standard diagnostic images of the lower limb and be able to recognise common abnormalities.

40. GLUTEAL REGION. LUMBAR PLEXUS.

Lumbar plexus
Sciatic nerve
Genitofemoral nerve
Muscles of gluteal region
Internal pudendal artery
Superior gluteal nerve
Inferior gluteal nerve
Clunial nerves
Posterior cutaneous nerve of thigh
Superior gluteal artery
Inferior gluteal artery
Lymphatic drainage of gluteal
and thigh regions

Describe the anatomy of the gluteal (buttock) region and the course of the sciatic nerve within it. Explain how to avoid damage to the sciatic nerve when giving intramuscular injections.
Outline the origin of the lumbosacral plexus and the formation of its major branches.
Describe the origin, course and function of the sciatic, femoral, obturator, common peroneal and tibial nerves, sural and saphenous nerves and summarise the muscles and muscle groups that each supplies as well as their sensory distribution.
Demonstrate the origin, course and branches of the major arteries that supply the gluteal region.
Interpret standard diagnostic images of the lower limb and be able to recognise common abnormalities.

41. THIGH.
Iliopsoas
Quadriceps femoris
Femoral triangle
Femoral nerve
Femoral artery
Femoral vein
Adductor canal
Biceps femoris
Inguinal lymph nodes
Pectineus
Sartorius
Medial muscles of thigh
Semitendinosus
Semimembranosus
Lateral cutaneous nerve of thigh
Describe the boundaries of the femoral triangle and the anatomical relationships of the femoral nerve, artery, vein and lymph nodes to each other and to the inguinal ligament, with particular regard to arterial blood sampling and catheter placement.
Describe the fascial compartments enclosing the major muscle groups and explain the functional importance of these compartments and their contents in relation to compartment syndromes.
Summarise the muscles responsible for the movements of the knee joint, their innervation and main attachments.
Demonstrate the origin, course and branches of the major arteries that supply the hip and thigh. Explain the functional significance of anastomoses between branches of these arteries at the hip.
Demonstrate the locations at which the femoral and popliteal pulses can be felt.
Demonstrate the course of the principal veins of the lower limb. Explain the role of the perforator vein connections between the superficial and deep veins and the function of the 'muscle pump' for venous return to the heart. Describe the sites of venous access that can be used for 'cutdown' procedures in emergencies.
Describe the anatomical basis (nerve root or peripheral nerve) for loss of movements and reflexes at the knee resulting from spinal injuries, disc lesions and common peripheral nerve injuries. Describe the dermatomes of the lower limb and perineum used to assess spinal injuries.
Describe the lymphatic drainage of the lower limb and its relationship to tumour spread.
Interpret standard diagnostic images of the thigh, leg and foot limb and be able to recognise common abnormalities.

42. LEG. FOOT.
Popliteal fossa
Popliteal artery
Popliteal vein
Anterior and posterior tibial artery
Tibial nerve
Common fibular nerve
Dorsal artery of foot
Medial and lateral plantar arteries
Great saphenous vein
Small saphenous vein
Muscles of anterior compartment of leg
Muscles of lateral compartment of leg
Muscles of posterior compartment of leg
Muscles of foot
Medial and lateral plantar nerves

Describe the fascial compartments enclosing the major muscle groups and explain the functional importance of these compartments and their contents in relation to compartment syndromes.
Summarise the muscles responsible for the movements of the ankle joint, their innervation and their main attachments.
Describe the boundaries and contents of the popliteal fossa.
Demonstrate the origin, course and branches of the major arteries that supply the leg, ankle and foot.
Demonstrate the locations at which the popliteal, dorsalis pedis and posterior tibial pulses can be felt.
Demonstrate the course of the principal veins of the lower limb. Explain the role of the perforator vein connections between the superficial and deep veins and the function of the 'muscle pump' for venous return to the heart. Describe the sites of venous access that can be used for 'cutdown' procedures in emergencies.
Describe the anatomical basis (nerve root or peripheral nerve) for loss of movements and reflexes at the ankle resulting from spinal injuries, disc lesions and common peripheral nerve injuries. Describe the dermatomes of the lower limb and perineum used to assess spinal injuries.
Describe the lymphatic drainage of the lower limb and its relationship to tumour spread.
Interpret standard diagnostic images of the thigh, leg and foot limb and be able to recognise common abnormalities.

OTHER (IF ANY):

1. Tutorials for students
2. Review sessions for the semester/final exams

OBLIGATORY LITERATURE:

1. Clinically Oriented Anatomy 7th ed., Moore K.L, Dalley A.F, Agur A.M.R, Lippincott Williams&Wilki
2. High Yield Gross Anatomy, Dudek R.W, Louis T.M., Lippincott Williams&Wilki
3. Atlas of Human Anatomy, A.M. Gilroy, B.R. MacPherson, L.M. Ross, ThiemeMedical Publishers, Inc

COMPLEMENTARY LITERATURE:

1. Gray's Anatomy for Students, 3rd Edition. Authors: Richard Drake & A. Wayne Vogl & Adam W. M. Mitchell
2. Human Anatomy, Color Atlas and Textbook, 6th Edition. Authors: John A. Gosling & Philip F. Harris & John R. Humpherson & Ian Whitmore & Peter L. T. Willan

Requirements for didactic aids (multimedia projector, movie camera, etc.)

- Laptop
- Multimedia projector
- TV

Conditions for obtaining a credit for the subject:

GENERAL COURSE INFORMATION:

The Human Anatomy Course is spread over two semesters and covers topics concerning gross anatomy and its clinical correlations. The course consists of seven sections:

FALL SEMESTER

1. BACK (20)
2. THORAX (35)
3. UPPER LIMB (30)
4. NEUROANATOMY (30)

SPRING SEMESTER

5. HEAD & NECK (55)
6. ABDOMEN & PELVIS (55)
7. LOWER LIMB (30)

Students are graded for class performance during each lab session. Students have the opportunity to obtain a maximum of 2 points during lab sessions for their performance.
Short quizzes are performed every lab sessions. The quizzes consist of 5 MCQs (3 anatomy MCQ, 1 clinical MCQ and 1 radiological images x-rays, USG, CT, and MRI images).
After every section students are required to take a partial test consisting of the following number of multiple choice questions: back - 20, thorax - 35, upper limb - 30, neuroanatomy - 30, head and neck - 55, abdomen and pelvis - 55 and lower limb - 30.
During Fall semester students have opportunity to obtain maximum 311 points and during Spring semester –

maximum 348 points.
To be allowed to take the Final Exam in the Human Anatomy course, a student must achieve no less than 51% from each semester and obtain a positive evaluation from the Department of Human Anatomy Faculty Council Meeting.
The final exam will consist of 100 multiple choice questions. To pass the final exam students have to answer at least 60% of the questions correctly and thus obtain at least 60 points.

COURSE COMPONENTS

1. LECTURES. Lecturers concentrate on major anatomical concepts, radiological anatomy and explain clinical relationships. They introduce a general outline of the subject and help the students understand the most important topics.

2. LAB SESSIONS AND ANATOMY DISSECTION. Topics according to the schedule and syllabus will be discussed during lab sessions. During these sessions students will have an opportunity to participate in dissections and to study prosections of the human cadaver.

3. RADIOLOGY & CROSS-SECTIONAL IMAGING. The aim of this part of the course is to teach students to understand the relationships of three dimensional anatomy and to connect these relationships to normal findings in radiology imaging.

4. CLINICAL IMPLICATIONS AND CORRELATIONS (Problem Based Learning). Clinical anatomy problems are discussed during every lab session. Case-study discussions will be held at the end of each section. Students will be given clinical problems and a set of related questions before the scheduled session.

5. SURFACE ANATOMY. Surface anatomy is an important part of the anatomy course, as it concerns the living body. It is aimed to develop abilities to recognize anatomical landmarks in the living human which are very helpful during clinical examination.

6. CLINICAL ANATOMY DISSECTIONS. These types of dissections performed by surgeons and orthopedic surgeons explain the typical anatomical approach to surgical procedures. These sections are related to clinical cases described during lectures and in the reference anatomy book.

ATTENDANCE AND BEHAVIOR POLICY

Students attending the course have to formerly agree, accept and sign the Code of Honor.
Students MUST attend ALL lab sessions and lectures. Students are obligated to be prepared for classes and must actively participate in the discussions. Students should come to lab sessions prepared and on-time. Students MUST participate in labs and lectures in an active way. Student cannot receive a passing score for the subject if he/she missed more than one class without excuse of scheduled hours in the form of seminars, labs or practical classes. In the case of absences with excuse in the form of seminars, labs or practical classes, the content of classes the student missed shall be made up according to the schedule given by the teacher. In the case of a medical condition, a student is permitted 4 justified absences (30% absences of year -15% per each semester) does not apply for partial, semester final exam. In the case of excused absences supported with the certification of the Dean or Vice-Rector for Academic Affairs, such an absence is not included in the limit of scheduled hours, all missed work covered by the classes during excused absences shall be made up according to the schedule settled by the student with the teacher. Failure to obey the attendance policy will result in the student not being allowed to pass the semester and take the final exam. ALL missed quizzes for each anatomic section (for students with an approved medical excuse note from the Department of Human Anatomy and/or Dean's Office) will be made up after each Partial Test. Partial tests (for students with approved medical excuse note from the Department of Human Anatomy and/or Dean's Office) must be made up within one week from the date of the actual partial test.
Students must wear clean, ironed white coats (tie in the back) or material scrubs and lab shoes (white shoes) during all lab session and every time they enter the Department of Human Anatomy. Additionally, students must put on their head covers during dissection labs. The use of mobile phones or any other kind of electronic equipment is PROHIBITED during lab sessions, lectures and tests. Any form of photography (including conventional or digital cameras, video recording or mobile phone cameras) within the Department of Human Anatomy is FORBIDDEN. Polish law regulations in terms of Copyrights are applicable.

PROFESSIONAL BEHAVIOR

Students joining the medical school are expected to abide by the norms of professional behavior, which are characterized by the following attributes:

- honesty, punctuality and appropriate clothing
- acknowledging sources of information, avoiding pirating and plagiarism
- respecting other people's individuality, rights and property

- responsibility for own deeds and academic commitments
- ability to communicate clearly and provide full information when asked to do so during lab sessions and tests.

TESTS DESCRIPTION AND REQUIREMENTS FOR PASSING THE COURSE

1. PARTIAL TESTS

After every section students are required to take a partial test consisting of the multiple choice questions (students obtain one point for one correctly answered question):

- BACK 20
- THORAX 35
- UPPER LIMB 30
- NEUROANATOMY 30
- HEAD & NECK 55
- ABDOMEN & PELVIS 55
- LOWER LIMB 30

Attendance during partial tests is obligatory. Students who are not present at the partial tests will no have an opportunity to take them during the other term (the only exceptions is in the case of a justified absence supported by a medical excuse note meeting the Department of Human Anatomy's Attendance Policy. Students may inquire to view their tests for 3 days from the date of actual partial. The student must e-mail to the Department of Human Anatomy secretary at student@imul.pl_to fill in the form and inform them that they would like to come and see their partial. The student will then receive a date and time when they can come and check their partial. ANY INQUIRES AFTER THE 3 DAYS HAVE PAST WILL NOT BE CONSIDERED.

2. QUIZZES

During every lab session students are required to take short quizzes, consisting of 5 MCQs (3 anatomy MCQ, 1 clinical MCQ and 1 radiological images x-rays, USG, CT, and MRI images). Students obtain 1 point for every correctly answered question.

Attendance at the quizzes is MANDATORY. Students who are not present during the quizzes will not have an opportunity to take them at a later date – ONLY EXCEPTION being a justified absence supported by the excuse note meeting Department of Human Anatomy's Attendance Policy. In such cases, students will have another opportunity to make up the quizzes. Only students with Department of Human Anatomy or Dean's Office approved/certified excuse notes will be able to make up a quiz/quizzes. Students with approved medical excuse note are allowed to make up max. 3 quizzes per one semester.

After each quiz the teaching assistant will go over the quiz and answer all questions pertaining to it. Inquiries about quizzes after that point will not be considered. Students may inquire to view their quizzes for 3 days from the date of actual partial. The student must e-mail to the Department of Human Anatomy secretary at student@imul.pl to fill in the form and inform them that they would like to come and see their quiz. The student will then receive a date and time when they can come and check their quiz. ANY INQUIRES AFTER THE 3 DAYS HAVE PAST WILL NOT BE CONSIDERED.

3. CLASS PERFORMANCE

Students will be graded for class performance during each lab session. Students will have the opportunity to obtain maximum of 2 points during lab sessions for their performance. This means answering given questions correctly and being active in class discussions. 1 Point will be given to students who answer a question correctly but were not active in the class discussions. Zero "0" points will be given to students who answer incorrectly. If a student did not have an opportunity to answer a question, he/she will be given an opportunity during the next lab. It is in the student's own interest to be active and answer questions during each lab as lab performance points are included in the Semester's Total Points. Not obtaining lab performance points throughout the semester will result in a lower total of points at the end of the semester.

During Fall semester students have opportunity to obtain maximum 311 points:

- Partial tests: 115 points
- Quizzes: 135 points
- Lab's activity: 56 points
- Lecture attendance: 5 points

During Spring semester students have opportunity to obtain maximum 348 points:

- Partial tests: 140 points

- Quizzes: 145 points
- Lab's activity: 58 points
- Lecture attendance: 5 points

4. FINAL EXAM

The Final Exam will take place on June (MAIUS LECTURE HALL).

The date of the final exam will not be changed. ALL STUDENTS QUALIFIED TO TAKE FINAL ARE REQUIRED TO TAKE THE FINAL EXAM. Students who do not attend the final exam will obtain a 'Fail' score and will have to take the exam during the retake session. The only exception is a justified absence supported by a medical excuse note meeting the Department of Human Anatomy's Attendance Policy.

To be allowed to take the Final Exam in the Human Anatomy course, a student must achieve no less than 51% from EACH semester and obtain a positive evaluation from the Department of Human Anatomy Faculty Council Meeting. The list of students who passed the course and can take the final exam will be posted on www.imul.pl after the final evaluation of the student's achievements which will take place during the Department of Human Anatomy Faculty Council Meeting.

To enter the final exam students must identify themselves with their student IDs or any other form of picture ID (passport, driver's license, etc…).

The final exam will consist of 100 multiple choice questions, during which students can obtain a maximum of 100 points (students obtain one point for every correctly answered question).

Students have 100 minutes to answer the examination questions.

To pass the final exam students have to answer at least 60% of the questions correctly and thus obtain at least 60 points.

Students, who will obtain at least 560 points will get extra 15 points to the final exam.

In the case of a student not passing the final examination, the student will have another opportunity to pass the exam during the Retake Exam (test).

- ☐ 1st retake (test) on September (Department of Human Anatomy)
- ☐ 2nd retake (test) on September (Department of Human Anatomy)

Dates of the final exam retakes (tests) will not change, and there will be no exceptions made. Students who do not attend the final exam retakes (tests) on the given dates will obtain a 'Fail' score. The only exception is a justified absence supporting by a medical excuse note meeting the Department of Human Anatomy's Attendance Policy. In this case, a date will be individually assigned to the student by the Course Coordinator.

The final evaluation of the Human Anatomy course and exams for all students will be announced after the Department of Human Anatomy Faculty Council Meeting.

5. TEST RESULTS

Students' scores, including quizzes, partial as well as the final exam will be posted on the IMUL website (www.imul.pl) of the Department of Human Anatomy within **3** days following each test (no names will be given, only student' ID numbers with a L or a Department ID# student's received at the beginning of academic year). The quizzes, partials will be gone over during the SEMINAR ONLY. Any questions and/or concerns regarding the quiz, partial test should be address at that time.

6. REQUIREMENTS FOR PASSING THE COURSE

In order to complete the course students have to:

- obey attendance and behavior policy;
- obtain at least 51% of the total points from both semesters (evaluated during Department of Human Anatomy Faculty Council Meeting).
- pass final examination.

7. FINAL EXAMINATION'S GRADING SCALE:

- less than 60 % 2,0 (fail)
- 60 – 70 % 3,0 (pass)
- 71 – 79 % 3,5 (satisfactory)
- 80 – 84 % 4,0 (good)
- 85 – 89 % 4,5 (better than good)
- 90 – 100 % 5,0 (very good)

Final results for passing the course will be posted after the evaluation of student's achievements which will take place during Department of Human Anatomy Faculty Council Meeting and will consist of the student's final grade for the Human Anatomy course. Please note that results will be posted online ONLY for students who have filled out a evaluation questionnaire within 5 working days.

SUMMER/WINTER HUMAN ANATOMY REMEDIAL COURSE

Students who do not obtain enough points/percentage and are not allowed to take the Final Exam may apply to participate in the Remedial Course for Anatomy at the Dean's Office. The Remedial Course will be held after each semester. Only students who obtain not less than 40% for the semester will be able to take the Remedial course. The deadline for applications is 24 hours after announcing the results for the given semester. All applications will be carefully reviewed by the Dean and the Faculty Council of the Department of Human Anatomy to make sure each student's qualifications meet the guidelines of the Remedial Course. The dates and location for the Remedial Course will be announced on the IMUL website. The Remedial Course for Human Anatomy ends with the final Test consisting of 80MCQs. To pass the Final Test student has to obtain minimum 60% of total amount of points. After obtaining appropriate number of points during the Remedial Course students are eligible to take Anatomy Course during the Retake Exams. The Summer/Winter Human Anatomy Remedial Course will consist of 30 academic hours of lab. The Department of Human Anatomy informs that the Remedial Course is not given after each semester. All suggestions, comments and requests MUST be addressed to the course coordinator at student@imul.pl. No other form of communication has legal value.

RULES AND REGULATIONS OF THE DISSECTING ROOM

1. Students are very fortunate to be able to learn from human material that has been generously given by people who have donated their bodies for the benefit of medical science. The specimens in the Dissecting Rooms are subjects for anatomy studies exclusively; any other form of behavior is a violation of the human shrine and dignity. All students are obligated to have and show utmost respect for the specimens at all times, by obeying the medical profession rules about privacy and respect. The strict abidance of the below described Dissecting Room Regulations is the disciplinary responsibility of every student. Any disrespect to the cadavers is a breach of professional conduct. Removal of any cadaver parts whatsoever from the laboratory is a crime.
2. The specimens in the dissection rooms are available for students from Monday to Thursday, except for scheduled dissection periods. Being able to study human anatomy on real cadaver specimens is a privilege and a great opportunity to learn. Dissection specimens are difficult to prepare and have to be handled with care. Students are obliged to wrap specimens up in a wet cloth, before leaving the dissecting room.
3. Disarticulated bones are also available, and should not be removed from the dissection room or lab-classes.
4. Only authorized individuals including medical students, faculty, other health-related personnel and facility workers are permitted to access the dissection room.
5. Students are to provide their own lab coats that tie in the back, head covers, gloves and dissecting instruments (scalpels, tweezers) and should be brought to every lab session and kept in a properly closed container. Lab coats 9that tie in the back) and gloves must be worn at all the times in the dissection room for hygienic purposes; open toe shoes are not allowed during labs.
6. Students are allowed to dissect specimens only in the presence of an assistant professor.
7. Examination of the specimens, should be performed with appropriate care in order to prevent damage to the specimens. At the end of each dissection session students are required to wrap the specimens in a wet cloth and only after that are the students allowed to leave the Dissecting Room area. The Dissecting Room should be left after hands have been carefully washed under running water using soap.
8. After finishing a dissection session, used gloves and paper towels must be thrown into the appointed trash containers.
9. Used scalpels should be collected in a special container. These mustn't be thrown into the regular trash bins.
10. Any accidents, injuries and other emergencies within the Dissecting Room must be immediately reported to the assistant professor. The students are informed about dissection room safety rules during the first lab session of the course. These regulations are obligatory to every student.
11. In the case of small cuts or injuries in the dissecting room students should remove gloves and wash the injured area with soap and water then cover with a sterile bandage and put on clean gloves.
12. No eating or drinking is allowed in the dissection room or lecture theater.
13. No smoking is allowed in any part of the department.
14. No cellular phones or any type of electronic devices are allowed in the dissection room.

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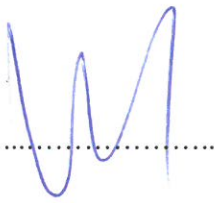
Signature of the head of the department/clinic



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Date of submission: .....