



Sveučilište u Rijeci • Fakultet dentalne medicine  
University of Rijeka • Faculty of Dental Medicine

**Course: Anatomy**

**Course coordinator: Tanja Ćelić, Assistant Professor**

Department: Anatomy

Study program: Integrated Undergraduate and Graduate University Study of Dental Medicine

Year: 1<sup>st</sup>

Academic year: 2021/2022

## **SYLLABUS**

### **Course information (brief course description, general guidelines)**

Anatomy is a first-year compulsory course of the Integrated Undergraduate and Graduate University Study of Dental Medicine in English. The course consisted of 38 hours of lectures, 46 hours of seminars, and 66 hours of practicals, a total of 150 hours (17.5 ECTS).

The course aims to learn about the morphological and structural organization of the human body through topographic and systematic anatomy. Acquired knowledge of anatomy should enable the students to better understand the physiological, pathophysiological, and pathological processes in the body and master the clinical subjects of dental medicine. Students will acquire knowledge of general anatomy and knowledge of the structure of organs.

Course content: general anatomy, general and special osteology, general and special syndesmology, general and special myology, general and special neurology, general and special angiology, general and special splanchnology, special senses, topographic anatomy of the head and neck, topographic anatomy of the thoracic cavity and abdomen, anatomy of the upper and lower extremities.

#### **Learning outcomes:**

I. Cognitive domain - knowledge

Acquisition of basic theoretical knowledge in the field of human body structure.

II. Psychomotor domain - skills

Acquiring the skills of recognizing and showing anatomical structures on a cadaver and concluding about the mutual relations of individual organs within certain topographic regions.

#### **Forms of teaching:**

Classes are held in the form of lectures, seminars, and practicals. During the practicals, students must have protective clothing and instruments to show the anatomical structures on the anatomical sections of the corpse (anatomical tweezers, button probe, and gloves as needed).

For the course, the Department of Anatomy organizes periodic theoretical and practical consultations with teachers and an anatomical classroom study time where students can watch repeat anatomical structures and consult student demonstrators of the Department of Anatomy.

**The student is required to study in advance for each seminar and practicals.**

The course is designed so that students have the opportunity to practice describing anatomical structures and also to discuss the importance of knowing the anatomical structure in their future profession. The schedule and content of classes are defined and published in advance. During the practicals, the teacher points to the anatomical specimens and monitors the participation of students in performing the practicals. An active discussion on a given topic is expected in seminars. Students achieve points through 5 midterms which consist of the practical and oral examination. Points gaining system in midterms is described in Table 1.

**Assigned reading:**

Platzer, Werner: Color Atlas of Human Anatomy: Vol. 1: Locomotor System. Thieme, 2014.  
Fritsch, Helga: Color Atlas of Human Anatomy: Vol. 2 Internal Organs. Thieme 2014.  
Paulsen F, Waschken J. Sobotta: Atlas of human anatomy, 16th ed. Elsevier, 2019.

**Optional / additional reading:**

Richard L. Drake, A. Wayne Vogl, Adam W.M. Mitchell: Gray's Anatomy for students, 3rd Edition  
Eric W. Baker: Anatomy for dental medicine, Latin nomenclature, 2nd Edition

**Grading system**

**ECTS Grading System:**

Student grading is conducted according to the current Ordinance on Studies of the University of Rijeka (approved by the Senate).

Students work is assessed and graded during the course and at the final exam. During the course, a student may achieve up to 50% of the grade, and at the final exam up to 50% of the grade (meaning, out of the maximum 100 points, during the course students can achieve 50 points, and on the final exam also 50 points). Students are graded according to the ECTS credit (A-F) and numeric (1-5) system.

**I. Assessment and grading in class (up to 50 points):**

During the course, students are awarded points by taking 5 midterm exams:

MIDTERM 1 - EXTREMITIES (MS/MI)  
MIDTERM 2 - CRANIUM AND CNS (CR-CNS)  
MIDTERM 3 - TOPOGRAPHIC ANATOMY OF HEAD AND NECK (CC1)  
MIDTERM 4 - ORGANS OF HEAD AND NECK (CC2)  
MIDTERM 5 - THORAX, ABDOMEN (AT)

A midterm consists of an oral and practical examination. The practical part examines students' ability to deliver a hands-on exploration of human cadavers. **Passing the practical part is a**

**prerequisite to approach the oral part of the midterm.** The oral part assesses students' theoretical knowledge. When a student passes the oral part of a midterm he/she gains a number of points that corresponds to the awarded grade.

The midterms are graded as shown in Table 1:

Table 1.

	ORAL		PRACTICAL		min	max
	grade	points	Pass/fail	points		
EXTREMITIES	Excellent (5) Very good (4) good (3) sufficient (2) insufficient (1)	8 7 5 3 0		2    0	5	10
CRANIUM AND CNS	Excellent (5) Very good (4) good (3) sufficient (2) insufficient (1)	8 7 5 3 0		2    0	5	10
TOPOGRAPHIC ANATOMY OF HEAD AND NECK	Excellent (5) Very good (4) good (3) sufficient (2) insufficient (1)	8 7 5 3 0		2    0	5	10
ORGANS OF HEAD AND NECK	Excellent (5) Very good (4) good (3) sufficient (2) insufficient (1)	8 7 5 3 0		2    0	5	10
ABDOMEN THORAX	Excellent (5) Very good (4) good (3) sufficient (2) insufficient (1)	8 7 5 3 0		2    0	5	10
Sum of the points during classes					25	50

Students can retake a certain midterm (orally and practically) during dates assigned by the course coordinator. The midterm can be retaken only in case(s):

1. justifiably not attending the regular date of the midterm
2. failing midterm(s) and lacking points to take the final exam
3. not passing the practical part of the midterm

## II. Grading at the final exam (up to 50 points):

The final exam is oral and is graded as follows:

Grade	Points
Excellent (5)	50
Very good (4)	40
Good (3)	30
Sufficient (2)	25

### Requirements for the final exam:

1. To attend classes in accordance with the Ordinance on Studies of the University of Rijeka.
2. To pass practical parts of all 5 midterms.
3. To gain at least 25 out of 50 points during the course.

### Who cannot take the final exam:

Students who gain less than 25 points during classes or who have more than 30% absence from classes cannot take the final exam, he/she must re-enroll the course in the following academic year.

## III. The final grade consists of the sum of points gained during the course and at the final exam.

Final grade	
A (90-100%)	Excellent (5)
B (75-89,9%)	Very good (4)
C (60-74,9%)	Good (3)
D (50-59,9%)	Sufficient (2)

### Other informations:

Teaching content and all information related to the course can be found on **Merlin system for e-learning and MSTeams** (you can access them by using student e-mail and AAI password). Lectures, seminars and practicals are held at the **Department of anatomy, Faculty of medicine**.

### List of lecture titles with description:

**L1. Introduction to anatomy, a brief history of anatomy. Parts of the body. General terms.**

Learning outcomes: The aim is to acquaint students with the subject they are beginning to study, anatomy will be defined as a morphological science. Anatomical methods of study will be analyzed and types of anatomy will be defined. Distinguish the organic system as a functional whole, analyze 10 organic systems. Define the concepts of anatomical orientation and the anatomical position of the body, which will show the position of the three basic orientation planes and axes concerning the body. Students will begin to use Latin terminology.

**L2. General syndesmology. Continuous and discontinuous joints.**

Learning outcomes: Analyze and discuss the general principles of the structure of joint. Explain the structure and function of the syndesmosis, synchondrosis, synostosis, and diarthrosis with examples. Define and describe shapes of articulated bodies of spherical, ellipsoidal, cylindrical, angular, and saddle joints, types of joints by shape and movements.

**L3. Muscle tissue and muscular system. Division of muscles. Skeletal, cardiac, and smooth muscles. Auxiliary structures of muscles.**

Learning outcomes: Define and describe general principles of skeletal muscle structure, skeletal muscle parts, and skeletal muscle shapes, muscle function (isometric, isotonic, and tonic contraction). Fascia as an auxiliary muscle structure. Describe the division of muscles according to regions of the body. Determine the position of the muscles according to the axes of the joints, based on the position towards the joint, conclude the movement performed by the muscle and synergistic and antagonistic action.

**L4. Nervous system. Central nervous system. Nerve cell, nerve fiber. Neuroglia.**

Learning outcomes: Analyze and discuss the general principles of the structure of the nervous tissue and organs of the nervous system. Explain the morphological and functional parts of a nerve cell. Explain the neural segment.

**L5. Cardiovascular system. Arteries. Veins. Lymphatic system.**

Learning outcomes: Describe and define the types of blood vessels, the structure of the blood vessels wall, and blood circulation. Describe the position of the subcutaneous veins of the extremities.

**L6,7. Cranium.**

Learning outcomes: As an introduction to the study of the skeleton of the head, define and describe general features of the skull bones, cranial norms (frontal norm and lateral norm), skull base, and skull roof. Orient, describe, and show the basic parts of the neurocranial and viscerocranial bones.

**L8,9. Basis cranii interna and externa. Openings for nerves and blood vessels.**

Learning outcomes: Define and describe the internal and external skull base, bones consisting of it, and openings. Describe and analyze the content of each skull base opening.

**L10. Cavities of viscerocranium – orbit, oral and nasal cavity. Shapes of the skull.**

Learning outcomes: Describe cavities of the viscerocranium (oral, nasal, and orbit). Define borders and communication of each cavity, analyze the bones bordering the cavities. Describe viscerocranial isolated bones.

**L11. Maxilla and mandible.**

Learning outcomes: Describe and analyze the maxilla and mandible.

**L12. Nervous tissue. Division of the nervous system, anatomical and functional. Organs of the central and PNS. Brain overview.**

Learning outcomes: For the nervous system define: neuron and nerve tissue support cells, gray and white matter of nervous tissue, morphological and functional division of the nervous system. Overview of the brain morphology and division.

**L13. Cerebrum and cerebellum.**

Learning outcomes: For the cerebrum describe: division into hemispheres and parts of telencephalon medium; structure and functional arrangement of gray matter. For the cerebellum describe external shape and connection to parts of the brainstem, distribution and functional significance of gray matter of the cerebellum, cortex cerebelli, and deep gray matter.

**L14. CNS Functional systems. Motor systems.**

Learning outcomes: Define the pathways of the nervous system and analyze the types of pathways concerning function. Understand the principle of transmitting stimuli from neuron to neuron via synapses. Analyze the origin and center at which the path fibers begin or end. Describe the pyramidal motor pathways (tractus corticospinalis anterior et lateralis, tractus corticonuclearis), the centers and three circular pathways of the extrapyramidal system, and the efferent pathways of the extrapyramidal system: tractus rubroreticulospinalis, tectospinalis, vestibuloreticulospinal.

**L15. Head: muscles and fascia.**

Learning outcomes: define and describe: division into muscle groups and group characteristics, the concept of fascia, and the division of the fascia into sheets.

**L16. Arterial supply of head and neck.**

Learning outcomes: Define and describe: exit point, path, collateral and terminal branching and area of irrigation of a. carotis communis, path, terminal and collateral branching and area of irrigation of the a. maxillaris, define the topographic relations of the a. maxillaris according to the content of the infratemporal fossa, importance of a. maxillaris for irrigation of teeth, upper and lower jaws.

**L17. Overview of cranial nerves.**

Learning outcomes: For cranial nerves define and describe: twelve cranial nerves, types of fibers that contain certain cranial nerves, their nuclei in brainstem, site of exit from the brain and the connection with the nuclei in the brainstem, generally determine the area of innervation.

**L18. Head and neck nerves - cranial nerves (nn. IX, X, XI, XII)**

Learning outcomes: Analyze and discuss the exit from the brain, the passage through the cranial base, the types of fibers, branches and the area of innervation nn. IX, X, XI, XII.

**L19. Nervus facialis.**

Learning outcomes: In the example of n. facialis describe: nuclei in the brainstem and types of fibers, sensitive ganglion, the site of exit from the brain and the path through the cranial cavity, branching into intrapetrous and extrapetrous branches and the area of innervation, significance n. facialis for innervation of taste buds.

**L20. Orbit wall and communications. Lacrimal apparatus. Eyelids. Muscles of the eye.**

Learning outcomes: describe the bony orbit and its walls, the structure of the eyelids, describe the innervation and irrigation of the eyelids, the parts, innervation and blood supply of the lacrimal apparatus, identify the openings and communication of the orbit, describe the periorbit and fascial sheath of the eyeball, learn the origin, insertion, innervation and function of extrinsic muscles of the eyeball.

**L21,22. Visceral organs of the head and neck. Oral cavity: overview, palatum, vasculature, and innervation.**

Learning outcomes: define and describe: walls (cheek, lips, palate, bottom of the oral cavity) and communications, alveodental arches, the division of the oral cavity into a vestibule, and the oral cavity in the narrower sense.

**L23. Teeth (in situ, structure, permanent, deciduous, development).**

Learning outcomes: describe and explain teeth terminology, division, structure, innervation, and irrigation.

**L24. Nose and nasal cavity.**

Learning outcomes: describe and define the nasal cavities, the lateral wall of the nasal cavities, identify regions of the nasal cavities, learn the skeletal framework, walls, floor, and roof of the nasal cavities, learn to identify and describe the external nose, identify and describe paranasal sinuses, describe nares, choanae, and gateways of the nasal cavities, learn the irrigation and innervation of the nasal cavities and paranasal sinuses.

**L25,26. Larynx.**

Learning outcomes: describe and explain: wall and functional characteristics of the conductive airways. For laryngeal cartilage joints describe and explain: joints art. cricoarythaenoidea and art. cricothyreoidea, movements of vocal cartilage and consequently vocal folds, adduction and abduction of the vocal cords and consequent opening and closing of the rimae vocalis, laryngeal syndesmosis, position and mobility of the epiglottis.

**L27,28. Eyeball: blood supply, lens & cornea, iris, and ocular chambers, retina.**

Learning outcomes: Analyze the embryonic origin and morphology of the eyeball. Analyze and describe parts of the outer, middle, and inner eyelids.

**L29,30. External and middle ear.**

Learning outcomes: Students will identify the ear as an organ of hearing and balance, distinguish three parts of the ear, describe parts of the external ear, the irrigation, lymphatic drainage, and innervation of the external ear, describe parts of the middle ear, boundaries of the middle ear, identify and describe auditory ossicles and muscles associated with the ossicles, the irrigation, lymphatic drainage, and innervation of the middle ear.

**L31,32. Thoracic cavity, content, and walls. Diaphragm. Breathing. Lungs.**

Learning outcomes: describe and explain: external appearance and torso boundaries towards the neck, upper and lower extremities, division of the torso into chest, abdomen, and pelvis, division of torso cavities into thoracic, abdominal, and pelvic cavities, describe the anatomical elements of the chest wall (skeleton, muscles, fascia, and serous membranes), the position of the thoracic cavity organs, describe diaphragm morphology, function and innervation. Describe the position and shape of the right and left lungs. Analyze the contents of the hilus pulmonis and the elements of the pulmonary root (bronchus principalis, a. and v. pulmonalis), discuss the topographic relationships of the lungs to other organs of the thoracic cavity. Describe the pleural parietalis and pleura visceralis.

**L33,34. Abdomen surface anatomy and wall. Structure of internal organs: hollow and parenchymatose. Abdominal cavity overview. Peritoneum.**

Learning outcomes: describe and explain: basic features of the structure of internal organs, hollow and parenchymatous, describe the morphological and functional features of the wall layers of hollow organs, describe the hollow organ on the example of the heart and trachea, describe the morphological and functional features of the structure of parenchymal organs, on the example of the liver describe the stroma and parenchyma organs. Define the term serous membrane. Analyze the formation of visceral, parietal, and mesenteric leaf serous membranes. Describe the peritoneal serous membrane, explain its function and innervation.

**L35,36. Blood vessels – abdominal aorta, v. cava inf, v. portae. Main lymph vessels and abdominal lymph nodes.**

Learning outcomes: Describe and define retroperitoneal space. Describe the blood vessels in retroperitoneum. Describe main lymph vessels and lymph nodes in abdominal cavity.

**L37,38. Autonomic innervation of internal organs – chest, abdomen, pelvis.**

Learning outcomes: Describe and explain principles of autonomic innervation of internal organs. Describe and define plexus cardiacus, plexus coeliacus, plexus pelvinus.

**List of seminar titles with description:**

**S1,2. General osteology. Bone tissue. Development of bone. Bones of the upper and lower extremity. (Vol1: 14-17, 110-115, 118-119, 124-129, 186-187, 192-197, 202-205, 216-221)**

Learning outcomes: To analyze and discuss general principles of skeletal element structure. Systematize skeletal elements by shape, structure, functional characteristics, and developmental changes of the skeleton. Define the division of the skeletal system into appendicular and axial skeletons and define the bones that make up the bones of individual groups. Bone as an organ of the skeletal system (a division of bone types into long, short, and flat, define pneumatic and sesame bones, the structure of a compact and spongy bone substance, skeletal development



through chondral and desmal ossification). Describe the main morphological characteristics of the skeletal elements of the upper and lower extremities.

**S3,4. Division of joints by shape. Joints of the upper and lower extremity.** (Vol1: 28-29, 112, 116-117, 120-123, 130-131, 188-191, 198-201, 206-215, 222-231)

Learning outcomes: Practice describing joint surfaces, joint capsules, and movements that take place in the joints of the upper and lower extremities. Analyze the biomechanical laws of motion in the joints. Show and analyze movements in the joints.

**S5,6. Muscles of upper and lower extremity.** (Vol1: 136-173 (158-173), 180-183, 232-268 (256-268), 276-279)

Learning outcomes: Analyze the division of limb muscles by groups and name the muscles. Discuss the position of muscle groups relative to a joint and the axis of a particular movement in that joint. Based on the muscles of the extremities, analyze the position of muscle groups in the axis of the joint and their synergistic and antagonistic effects. Describe and discuss the biggest muscles of the upper and lower extremity.

**S7,8. Peripheral nervous system. Nerves of the upper and lower extremity.** (Vol3: 70, 74-83, 86-97)

Learning outcomes: Describe the spinal nerve, the type of fibers, the origin and destination of nerve fibers, the branches, the peripheral plexuses, and the peripheral nerves. Describe and analyze nerves of upper and lower extremities.

**S9,10. Blood vessels of the upper and lower extremity.** (Vol2: 54-65, 72-73, 76-77)

Learning outcomes: Define and describe the arterial and venous trunk of the upper and lower extremities. Describe important topographic regions of extremities, their borders, and their content.

**S11,12. Cavities of viscerocranium – orbit, nasal and oral cavity. Shapes of the skull.** (Vol1: 306 – 315)

Learning outcomes: Orient, describe, and show the basic parts of the skull bones that make up the visceral part of the skull (mandible, maxilla, zygomaticum axis, nasal axis, palatinum axis, ethmoid axis, lacrimal axis, vomer, inferior concha nasalis, hyoideum axis). Describe in short orbit, nasal and oral cavity their walls and relation to each other.

**S13,14. Temporomandibular joint. Teeth.** (Vol1: 316-317, Vol2: 158-163)

Learning outcomes: For articulation temporomandibularis analyze and describe: joint surfaces, discus articularis, and joint capsule, movements performed in it, on the example of m. masseter explain why a particular muscle performs a certain function. Analyze and describe the shapes and parts of the teeth.

**S15,16. Spinal cord and brainstem.** (Vol3: 50-55, 108-111, 100-101, 132-133)

Learning outcomes: Describe the vertebral column, shape, movements and joints. Describe external shape and location of the spinal cord, structure and functional arrangement of the gray matter of the spinal cord, arrangement of motor, sensory, autonomic neurons and interneurons, connection of spinal cord neurons with spinal nerve fibers.

For the brainstem, describe: external shape and location, structure and functional arrangement of the gray matter, nuclei of cerebral nerves, special motor and sensory gray matter, reticular substance, pathways whose fibers make up the white matter of the spinal cord and brainstem.

**S17,18. Cerebrovascular and ventricular system. Meninges.** (Vol3: 272 - 291)

Learning outcomes: Describe the parts of the dura mater, pia and arachnoid. Describe blood vessels of the brain, the path and branching of the intracranial part of the a. vertebralis and a. carotis internae. Describe ventricular system of the brain.

**S19,20. Sensory systems.** (Vol3: 322-334)

Learning outcomes: Describe non-specific and specific sensory pathways. Describe the position of the body of neurons, the path of neuronal fibers and the function of the following pathways: pathways of nonspecific sensations (fasciculus gracilis et cuneatus, tractus spinothalamicus anterior et lateralis, tractus spinocerebellaris anterior et posterior), pathways of specific sensations (visual, auditory, vestibular, taste).

**S21,22. Neck: muscles and fascia. Regions of head and neck.** (Vol1: 326-331, 334-335)

Learning outcomes:

Analyze and discuss the division, position, and functional characteristics of the neck muscles. Describe cervical fascia, layers, relation to muscles and big blood vessels. Describe the regions of the head and neck, its borders and general content.

**S23,24. Maxilar artery. Veins and lymphatics of the head and neck.** (Vol2: 48-49, 68-69, 80-81)  
**Regiones cervicales ventrolaterales** (Vol1: 358-367)

Learning outcomes: Analyze and discuss maxillary artery, its pathway, branches and area of irrigation. Describe the venous sinuses of the skull and their nodal points. Describe lymphatic system of head and neck. Describe ventrolateral regions of the neck, its borders and content.

**S25,26. Nervus trigeminus.** (Vol3: 124-128)

Learning outcomes: Analyze and discuss the exit from the brain, the passage through the cranial base, the types of fibers, branches and the area of innervation of n. V.

**S27,28. Cranial nerves (nn. IX, X, XI, XII) Parasympathetic ganglia.** (Vol 3: 112-119, 128-131)

Learning outcomes: Analyze and discuss the exit from the brain, the passage through the cranial base, the types of fibers, branches and the area of innervation nn. IX, X, XI, XII. Discuss meaning of parasympathetic ganglia. Describe parasympathetic innervation pathways in head and neck.

**S29,30. Regio facialis. Innervation of the face and teeth. Anatomy of local anesthesia (n. maxillaris, n. mandibularis)**

Learning outcomes: describe and analyze regions of the face, its content and innervation. Describe in detail innervation of upper and lower teeth, nerve branching and anatomical site of anesthesia.

**S31,32. Cranial nerves (nn. I, II, III, IV). Regio orbitalis , Orbit from the upper side.** (138-139 (3), 338-339, 344-345 (1))

Learning outcomes: Analyze and discuss the exit from the brain, the passage through the cranial base, the types of fibers, branches and the area of innervation nn. I, II, III, IV, VIII

**S33,34. Tongue (mucosa, muscles, neurovasculature and gustatory pathway). Floor of the oral cavity. Salivary glands.** (Vol2: 148-157)

Learning outcomes: define and describe tongue parts, position, mucosa structure, external and internal tongue muscles, their function, irrigation and innervation of tongue. Describe and analyze floor of the oral cavity, suprahyoid muscles, salivary glands, nerves and arteries in this region.

**S35,36. Pharynx. Esophagus. Swallowing** (Vol2: 168-171, 176-177)

Learning outcomes: define and describe the pharynx, the skeletal framework, pharyngeal wall, pharyngeal fascia and gaps in the pharyngeal wall, the nasopharynx, oropharynx, laryngopharynx, and tonsils, learn the irrigation, lymphatic drainage, and innervation of the pharynx. Describe the stages of the act of swallowing and the muscles involved in each individual phase of swallowing. Explain which part of the act of swallowing is influenced by voluntary and conscious control and innervation and which is reflexively conditioned and cannot be voluntarily prevented. Explain which cranial nerves guide the afferent fibers and form the afferent and which the efferent arm of the reflex arc for the act of swallowing.

**S37. Lymph nodes of head and neck. Trachea. Topographical anatomy on head and neck slices.** (Vol2: 80-81, 108-121, 172- 175)

Learning outcomes: Describe and analyze the groups and position of lymph nodes of head and neck, their drainage sites and main lymph vessels. Describe trachea, its cartilages, and topographical relations. Analyze topographical anatomy on head and neck slices.

**S38. Eye: visual system, overview, lesions, reflexes, coordination.** (Vol3: 358-363)

Learning outcomes: describe and define parts of visual system pathway, its lesions, reflexes and eyeballs coordination of movements.

**S39. Inner ear, auditory and vestibular apparatus, auditory and vestibular pathway.**

Learning outcomes: describe parts of the internal ear, the bony and membranous labyrinth, define organs of balance and the organ of hearing, and know the irrigation, lymphatic drainage and innervation of the internal ear.

**S40,41. Heart.** (Vol2: 10-35)

Learning outcomes: Describe small and large blood circulation, define and distinguish their function. Describe the structure of the heart wall, describe the layers of the heart wall; endocardium, myocardium and epicardium, describe the shape and features of 4 heart cavities; right and left atria and right and left ventricles. Describe 4 cardiac orifices, describe valves of 4 cardiac orifices, define conductive cardiac musculature and explain its structure and function, describe irrigation (aa. and vv. coronariae), analyze topographic relations of the heart.

**S42,43. Organs of abdominal cavity.** (Vol2: 182-221)

Learning outcomes: name and describe the location and relations of abdominal organs and their surface anatomy.

**S44, 45. Pelvis – internal male and female genital organs. Urinary system. (Vol2: 231-283)**

Learning outcomes: define and describe pelvic space, list the organs of the small pelvis, topographic relations of the female and male pelvic organs, female and male sexual organs. Define and describe the structure, parts and topography of male and female internal genital organs. Describe bladder and rectum morphology and relation to other structures in pelvic cavity.

**S46. External male and female genital organs.**

Learning outcomes: Define and describe male and female external genital organs.

**List of practical titles with description:**

**Students have to study the theory before coming to the practicals.** It is obligatory to wear a lab coat and have tweezers.

**P1-3. Bones of upper and lower extremity. (Vol1: 110-115, 118-119, 124-129, 186-187, 192-197, 202-205, 216-221)**

Learning outcomes: On anatomical preparations, place the skeletal element in the orientation position, argue the way in which the orientation was performed. Show and describe the parts of the bones that make up the skeletal element. Show the position of certain roughnesses, bumps and nodules, and bone lines and ridges that serve as muscle grips. Show and describe the shape and position of joint surfaces. It includes the bones of the upper and lower extremity: clavícula, scapula, humerus, ulna, radius, carpal, metacarpal bones and finger joints, the axis of the coxae, femur, tibia, fibula, tarsal, metatarsal bones and members of the toes.

**P4-6. Joints of upper and lower extremity. (Vol1: 112, 116-117, 120-123, 130-131, 188-191, 198-201, 206-215, 222-231)**

Learning outcomes: On anatomical preparations, show and describe joint surfaces, joint capsule, determine the type of joint with regard to the shape of joint bodies and show the movements that take place in a particular joint.

**P7-9. Muscles of the upper and lower extremity. (Vol1: 136-173 (158-173), 180-183, 232-268 (256-268), 276-279)**

Learning outcomes: In the anatomical section, show the muscles of the upper extremity in groups (shoulder girdle muscles, thoracohumeral muscles, upper arm muscles, forearms and hands) and also lower extremity in groups (muscles of the hip, thigh, lower leg and foot). For each group, show the muscles, show their starting point and grip, and explain the function they have in each joint.

**P10-12. Nerves of upper and lower extremity. (Vol3: 70, 74-83, 86-97) Review of the upper and lower extremity muscles.**

Learning outcomes: Show the position and branches of the plexus brachialis, plexus lumbalis and plexus sacralis on the anatomical preparation.

**P13-15. Blood vessels of upper and lower extremity. (Vol2: 54-65, 72-73, 76-77)**

Learning outcomes: Describe and show on an anatomical preparation the path and branching of blood vessels that irrigate the upper extremity. Show the position, boundaries and content of the topographic regions of the extremities: spatium axillare, sulci bicipitales, fossa cubiti, canalis carpi, canalis inguinalis, trigonum femorale, fossa poplitea.

**P16-18. Basis cranii interna and externa. Viscerocranial cavities.** (Vol1: 294 - 311)

Learning outcomes: On the anatomical preparation of the macerated skull show the skull base and parts of the skull bones that participate in the construction of the base. Demonstrate the way the skull opens and separates the skull roof. Show the surfaces of the skull base. Delimit and distinguish 3 pits of the inner cranial base: anterior, middle and posterior cranial fossa/ and 3 fields of the external cranial base: anterior, middle and posterior field. For each, show the surfaces of the parts of the skull bones that participate in the construction of each, show the communication openings and channels that penetrate it, and show the cranial spaces with which they are connected.

**P19-21. Mandible. Maxilla. Teeth. Vertebrae, ribs, sternum. Vertebral column.** (Vol1: 302-305, 36-49, 54-63)

Learning outcomes: On anatomical preparations of macerated mandibles and maxillae show and describe significant structures. On the anatomical preparation of the macerated skull show and describe the limitations of the following cavities of the viscerocranium and lateral regions of the skull: orbit, nasal cavity and oral cavity, fossa temporalis, fossa infratemporalis, fossa pterygopalatina. Show significant structures on the anatomical preparation of macerated vertebrae and ribs and distinguish individual groups of vertebrae and ribs.

**P22-24. General description of the brain. Medulla spinalis. Brainstem and cerebellum.** (Vol3: 152-155)

Learning outcomes: Show and describe the shape and segments of the spinal cord on the anatomical preparation. On cross-sections of the spinal cord in different segments to notice the difference in the mass of gray and white matter in the internal structure. Show the exit points of the roots of the spinal nerves, the cauda equina and the hard sheath of the spinal cord. Show and describe parts of the brainstem: the medulla oblongata, pons and midbrain. Connect the external appearance of parts of the brainstem with the internal structure and position of deep gray masses. On the anatomical section of the brain show and describe the cerebellum. Describe the peduncles of the cerebellum and show how they connect the cerebellum to parts of the brainstem. Demonstrate an anatomical approach and opening of the fourth ventricle and communication with the subarachnoid space.

**P25-27. Diencephalon. Telencephalon. Basal ganglia.** (Vol3: 172, 200, 208, 214, 246-257, 152-155)

Learning outcomes: Show and describe parts of the midbrain in the anatomical section of the brain. Demonstrate access to and opening of the third chamber. Connect the external appearance with the internal structure and the position of the deep gray masses. Describe and show the position of the pituitary gland. In the anatomical section of the brain, show and describe parts of the cerebrum and the approach and opening of the lateral chambers. Connect the external appearance with the internal structure and the position of the deep gray masses. Describe and show the position of the basal ganglia.

**P28-30. Review of cranium and CNS morphology.**

Learning outcomes: Integrate the knowledge acquired at this sections course. Describe brain sections at different levels (sagittal, frontal and horizontal).

**P31. Head and neck: muscles and fascia (Vol1: 318-331), regions of head and neck (334-335). Regio mediana cervicalis (354-355)**

Learning outcomes: Name and describe muscles of head and neck. Describe using anatomical terminology, name and on the anatomical section of the neck show muscle constraints, content and interrelationships of the structure that make up the content of the anterior neck region, regio colli media (fascia pretrahealis, jugularis anterior vein, arcus venosus juguli, larynx, os hyoideum, m. mylohyoideus).

**P32-34. Arteries and veins of head and neck. (Vol2: 46-54, 68-69, 80-81) Regiones cervicales ventrolaterales (Vol1: 358-367)**

Learning outcomes: Using anatomical terminology, name and describe and on the anatomical section of the neck show muscle constraints, content and interrelationships of structures that make up the contents of the space lateral to the pharynx, spatium parapharyngeum (arteria carotis interna, vena jugularis interna, n. IX, n. X, n. XI and n. XII, truncus sympathicus). Describe and show on the anatomical section of the neck the muscle constraints, content and interrelationships of the structures that make up the content of the carotid triangle trigonum caroticum (path and branching of the artery carotis communis, vena jugularis interna, truncus sympathicus, n. X, n. XI, n. XII). Name and describe borders and content of lateral neck. Describe plexus cervicalis.

**P35-37. Infratemporal fossa. Retromandibular fossa. (Vol1: 340-343, 352-353)**

Learning outcomes: Describe and show in the anatomical section of the neck and using anatomical terminology, name the muscle constraints, content and interrelationships of the structures that make up the contents of the infratemporal fossa (n. mandibularis, a. maxillaris, chorda tympani). Describe and show on the anatomical section of the neck and using anatomical terminology, name the muscle constraints, content and interrelationships of the structures that make up the contents of the pterygopalatal fossa (n. maxillaris, a. maxillaris, ganglion pterygopalatinum).

**P38-40. Nerves of head and neck (IX, X, XI, XII) and plexus cervicalis. Regio occipitalis, lateropharyngeum, retropharyngeum, trigonum submandibulare. (Vol3: 72-73, Vol1: 346-351)**

Learning outcomes: Describe and show on the anatomical section of the head and neck last four cranial nerves and plexus brachialis, its branches and regions where we can find those nerves. Show and describe borders of regions (occipitalis, lateropharyngeum, retropharyngeum, submandibulare), its position and anatomical structures.

**P41-43. Parotidomasseteric region. N. facialis.**

Learning outcomes: Describe and show on the anatomical section of the head facial nerve its branches and regions where we can find them. Describe and show in the anatomical section of the neck and using anatomical terminology, name the muscle constraints, content and interrelationships of the structures that make up the content of regioparotidomasseterica (glandula parotis, a. facialis, m. masseter) and fossa fossaretromandibularis (glandula parotis, a. temporalis superficialis, n. facialis, retromandibular vein).

**P44-46. Regions of head and neck: topography, relations, content.**

Learning outcomes: Describe and show on the anatomical section of the head and neck regions (anterior neck, lateral neck, deep lateral neck, infratemporal and pterygopalatine fossa, retromandibular fossa, parotidomasseteric region) and its content.

**P47-49. Teeth. Oral cavity. Innervation and blood vessels.**

Learning outcomes: In the anatomical section using anatomical terminology, name and show the walls, cavity and communications of the oral cavity. Show on the anatomical preparation parts of teeth, distinguish and describe the shape of morphologically different permanent teeth, incisors of canines, premolars and molars. Learn to write a permanent tooth formula.

**P50-52. Pharynx – division and contents, muscles, innervation. Potential tissue spaces in the head & spread of dental infections. Nasal cavity.**

Learning outcomes: On anatomical preparations, using anatomical terminology, name and show the walls, cavity and communications of the pharynx. Describe and analyze the structure of the wall and the pharyngeal cavity. Describe the muscles of the pharynx. Describe walls, communications of nasal cavity.

**P53-55. Larynx. Thyroid gland.**

Learning outcomes: In the anatomical section using anatomical terminology, name and show the walls, cavity, and communications of the larynx, trachea, and esophagus. Show parts of the thyroid gland.

**P56-58. Orbit. Eyelids. Sectional anatomy of the head and neck.**

Learning outcomes: show and describe walls of orbit, content of the orbit, vessels and nerves passing through orbit. Show and explain eyelids structure and function. Determine and discuss previously learned anatomical structures of head and neck on MRI sections (coronal, horizontal, sagittal cut).

**P59,60. Review of organs in head and neck.**

Learning outcomes: Discuss the factual questions on head and neck anatomy proposed in the book.

**P61,62. Heart and lungs.**

Learning outcomes: on the anatomical section show the position and shape of the right and left lungs. Show the hilus pulmonis and elements of the pulmonary root (bronchus principalis, a. And v. Pulmonalis), show the topographic relations of the lungs to other organs of the thoracic cavity. Show pleura parietalis and pleura visceralis. Determine the boundaries of the mediastinum and divide it into posterior and anterior mediastinum. Describe the structure of the heart wall, describe the layers of the heart wall; endocardium, myocardium and epicardium, describe the shape and features of 4 heart cavities; right and left atria and right and left ventricles and show them on the anatomical specimen. Describe and show 4 cardiac orifices on an anatomical specimen, describe valves of 4 cardiac orifices, define conductive cardiac musculature and explain its structure and function, describe irrigation (aa. And vv. Coronariae) and innervation of the heart (plexus cardiacus), analyze topographic relations of the heart. Describe and show the azygos vein system.

**P63,64. Digestive system organs (Vol2: 182-221)**

Learning outcomes: on the anatomical section show the shape, parts and position of the organs of the digestive system: esophagus, stomach, small and large intestine, liver and pancreas. Determine and show the topographic relationships of the organs of the digestive system in the neck, thoracic and abdominal cavity.

**P65,66. Retroperitoneum – organs and blood vessels. Pelvis – internal male and female genital organs. Urinary system. (Vol2: 231-283)**

Learning outcomes: Describe and show on the anatomical preparation the origin, path, collateral and terminal branching of the aorta (aorta ascendens, arcus aortae, aorta descendens), distinguish and show parietal and visceral branches of the aorta. Describe and show v. cava superior, v. cava inferior and v. portae, and their roots and main tributaries. On the anatomical section show the position and shape of kidneys, ureters, bladder and urethra. Analyze the topographic relationships of the retroperitoneal space organs, determine the skeletal and syntopic relationships of the kidneys to other retroperitoneal and peritoneal organs. Show on the anatomical section the internal organs of the male reproductive system, describe the testis, epididymis, ductus deferens, vesiculae seminales, prostate and describe their relationship. Show the internal organs of the female reproductive system. Describe the ovary, fallopian tube, uterus and vagina, distinguish these organs and describe their relationship.

**Course schedule**

Date	Lectures	Seminars	Practicals	Teacher assigned
01/11/2021	-	-	-	-
02/11/2021	L1 12:00-12:45			Tanja Ćelić, Assistant Professor
		S1,2 13:00-14:30		Tanja Ćelić, Assistant Professor
			P1-3 15:15-17:30	Tanja Ćelić, Assistant Professor
03/11/2021	L2 12:00-12:45			Tanja Ćelić, Assistant Professor
		S3,4 13:00-14:30		Tanja Ćelić, Assistant Professor
			P4-6 15:15-17:30	Tanja Ćelić, Assistant Professor
04/11/2021	L3 12:00-12:45			Tanja Ćelić, Assistant Professor



		S5,6 13:00-14:30		Tanja Čelić, Assistant Professor
			P7-9 15:15-17:30	Tanja Čelić, Assistant Professor
05/11/2021	L4 12:00-12:45			Tanja Čelić, Assistant Professor
		S7,8 13:00-14:30		Tanja Čelić, Assistant Professor
			P10-12 15:15-17:30	Tanja Čelić, Assistant Professor
08/11/2021	L5 12:00-12:45			Juraj Arbanas, Associate Professor
		S9,10 13:00-14:30		Juraj Arbanas, Associate Professor
			P13-15 15:15-17:30	Tanja Čelić, Assistant Professor
09/11/2021	<b>MIDTERM I</b>			
09/11/2021	L6,7 11:30-13:00			Tanja Čelić, Assistant Professor
	L 8,9 13:00-14:30			Tanja Čelić, Assistant Professor
10/11/2021	L10 12:00-12:45			Tanja Čelić, Assistant Professor
		S11,12 13:00-14:30		Tanja Čelić, Assistant Professor
			P16-18 15:15-17:30	Sanja Zoričić Cvek, Full Professor
11/11/2021	L11 12:00-12:45			Sanja Zoričić Cvek, Full Professor
		S13,14 13:00-14:30		Sanja Zoričić Cvek, Full Professor
			P19-21 15:15-17:30	Tanja Čelić, Assistant Professor
12/11/2021	L12 12:00-12:45			Sanja Zoričić Cvek, Full Professor
		S15,16 13:00-14:30		Sanja Zoričić Cvek, Full Professor
			P22-24 15:15-17:30	Tanja Čelić, Assistant Professor
15/11/2021	L13 12:00-12:45			Tanja Čelić, Assistant Professor
		S17,18 13:00-14:30		Tanja Čelić, Assistant Professor
			P25-27 15:15-17:30	Tanja Čelić, Assistant Professor

16/11/2021	L14 12:00-12:45			Sanja Zoričić Cvek, Full Professor
		S19,20 13:00-14:30		Sanja Zoričić Cvek, Full Professor
			P28-30 15:15-17:30	Tanja Ćelić, Assistant Professor
17/11/2021	<b>MIDTERM II</b>			
17/11/2021	L15 14:15 - 15:00			Tamara Šoić-Vranić, Associate Professor
		S21,22 15:00-16:30		Tamara Šoić-Vranić, Associate Professor
			P31 17:00-17:45	Tamara Šoić-Vranić, Associate Professor
18/11/2021	-	-	-	-
19/11/2021	L16 12:00-12:45			Tamara Šoić-Vranić, Associate Professor
		S23,24 13:00-14:30		Tanja Ćelić, Assistant Professor
			P32-34 15:15-17:30	Tanja Ćelić, Assistant Professor
22/11/2021	L17 12:00-12:45			Tanja Ćelić, Assistant Professor
		S25,26 13:00-14:30		Tanja Ćelić, Assistant Professor
			P35-37 15:15-17:30	Tamara Šoić-Vranić, Associate Professor
23/11/2021	L18 12:00-12:45			Tamara Šoić-Vranić, Associate Professor
		S27,28 13:00-14:30		Tamara Šoić-Vranić, Associate Professor
			P38-40 15:15-17:30	Tanja Ćelić, Assistant Professor
24/11/2021	L19 12:00-12:45			Tanja Ćelić, Assistant Professor
		S29,30 13:00-14:30		Tanja Ćelić, Assistant Professor
			P41-43 15:15-17:30	Tamara Šoić-Vranić, Associate Professor
25/11/2021	L20 12:00-12:45			Tamara Šoić-Vranić, Associate Professor
		S31,32 13:00-14:30		Tanja Ćelić, Assistant Professor
			P44-46 15:15-17:30	Tanja Ćelić, Assistant Professor
26/11/2021	<b>MIDTERM III</b>			

26/11/2021	L21,22 12:00-14:00			Juraj Arbanas, Associate Professor
29/11/2021	L23 12:00-12:45			Juraj Arbanas, Associate Professor
		S33,34 13:00-14:30		Juraj Arbanas, Associate Professor
			P47-49 15:15-17:30	Tanja Ćelić, Assistant Professor
30/11/2021	L24 12:00-13:30			Tanja Ćelić, Assistant Professor
		S35, 36 13:45-14:30		Tanja Ćelić, Assistant Professor
			P50-52 15:15-17:30	Tanja Ćelić, Assistant Professor
01/12/2021	L25, 26 12:00-13:30			Tanja Ćelić, Assistant Professor
		S37 13:45-14:30		Tanja Ćelić, Assistant Professor
			P53-55 15:15-17:30	Juraj Arbanas, Associate Professor
02/12/2021	L27,28 12:00-13:30			Tanja Ćelić, Assistant Professor
		S38 13:45-14:30		Tanja Ćelić, Assistant Professor
			P56-58 15:15-17:30	Tanja Ćelić, Assistant Professor
03/12/2021	L29,30 12:00-13:30			Juraj Arbanas, Associate Professor
		S39 13:45-14:30		Juraj Arbanas, Associate Professor
			P59,60 15:15-17:30	Tanja Ćelić, Assistant Professor
06/12/2021	<b>MIDTERM IV</b>			
07/12/2021	L31,32 12:00-13:30			Tanja Ćelić, Assistant Professor
		S40,41 14:00-15:30		Tanja Ćelić, Assistant Professor
			P61,62 15:45-17:15	Tanja Ćelić, Assistant Professor
08/12/2021	L33,34 12:00-13:30			Tanja Ćelić, Assistant Professor
		S42,43 14:00-15:30		Tanja Ćelić, Assistant Professor
			P63,64	Juraj Arbanas,

			15:45-17:15	Associate Professor
09/12/2021	L35,36 12:00-13:30			Tanja Ćelić, Assistant Professor
		S44,45 14:00-15:30		Tanja Ćelić, Assistant Professor
			P65,66 15:45-17:15	Juraj Arbanas, Associate Professor
10/12/2021	L37,38 12:00-13:30			Juraj Arbanas, Associate Professor
		S46 14:00-14:45		Tanja Ćelić, Assistant Professor
10/12/2021	<b>MIDTERM V</b>			

	<b>FINAL EXAM DATES</b>
1.	17.12.2021.
2.	04.07.2022.
3.	18.07.2022.
4.	05.09.2022.
5.	19.09.2022.