[Medicinski fakultet u Rijeci]

**Curriculum**
**2022/2023**

[Za kolegij]

# Anatomy

| | |
|---|---|
| Study program: | **Medical Studies in English (R)**<br>[Sveučilišni integrirani prijediplomski i diplomski studij] |
| Department: | **[Zavod za anatomiju]** |
| Course coordinator: | **izv. prof. dr. sc. Ćelić Črnac Tanja, dr. med.** |
| Year of study: | **1** |
| ECTS: | **22** |
| Incentive ECTS: | **0 (0.00%)** |
| Foreign language: | **Possibility of teaching in a foreign language** |

## Course information:

The course Anatomy is a compulsory course in the first year of the Integrated Undergraduate and Graduate University Study of Medicine in English. It consists of 56 hours of lectures, 40 hours of seminars, and 145 hours of practicals - overall 241 hours (22 ECTS).

**Course objective**

The basic aim of Anatomy is to provide the acquisition of knowledge about morphological and structural organization of the human body through the study of topographic and systematic anatomy. In detail, the course content encompasses the fundamentals of osteology, sindesmology, myology, as well as the basics of angiology and neurology. Additionally, the course covers the examination of bones, articulations, and muscles of the upper and lower limbs, as well of the head and trunk. Furthermore, detailed knowledge is elucidated regarding the topographical anatomy of various regions, such as the head and neck, including the regio temporalis, regio parotideomasseterica et retromandibular, regio palpebralis, regio faciei anterior (external nose, nasal cavity, and paranasal sinuses), fossa infratemporalis et pterygopalatina, cavum oris et trigonum submandibulare, trigonum caroticum, spatium parapharyngeum, regio colli media, regio colli lateralis, regio pectoralis et fossa axillaris, as well as the topographical anatomy of the upper limb (muscles, vessels, nerves, and lymph vessels), thorax, abdomen, lesser pelvis (including ventral abdominal wall and inguinal region, peritoneum and mesenteries, peritoneal cavity, extraperitoneal spaces, and the lesser pelvis), and the lower limb (muscles, vessels, nerves, and lymph vessels). In addition, the course covers the morphology of sensory organs, the spinal cord, spinal nerves, the brain, cranial nerves, brain vasculature, and meninges. Each student must obtain the skill in recognizing structures on the human cadaver specimen and the ability to use relevant anatomical nomenclature.

**Course content:**

General anatomy: basic principles of osteology, sindesmology, myology, angiology and neurology. Principles of organ structure. Structure and function of serous membranes. Anatomical nomenclature, main planes and axes in the body orientation.

Special anatomy: systemic and topographic anatomy of the upper and lower limb, cranium, head and neck, thorax, abdomen and pelvis. Morphology of the brain and spinal cord.

**Course learning outcomes**

I. Cognitive domain – knowledge

After having passed the Anatomy course, students should be able to:

1. define and choose adequate planes and axes for anatomical orientation

2. describe and explain the arrangement and position of organs in the body and their innervation and irrigation

3. describe, explain and connect general principles in the structure of organs with their function

4. describe and explain the systematic and topographical anatomy of the upper and lower extremities

5. define and explain the structure and relationships in the skeleton of the head

6. describe and explain the morphology of the central nervous system

7. define, describe and explain the systematic and topographical anatomy of the head and neck

8. describe and explain systematic and topographical anatomy of the chest, abdominal and pelvic cavity

9. demonstrate and self evaluate structures of human body on anatomical specimens

II. Psychomotor domain – skills

After having passed the Anatomy course, students should acquire the skills to identify and demonstrate anatomical structures on cadavers, as well as the ability to draw conclusions regarding the interrelationships of individual organs and structures within specific topographical regions.

**Course design**

For practicals and seminars, students are obliged to prepare in advance, because these parts of the course are designed as “flipped classrooms”. Seminars and practicals are designed to give students the opportunity to engage in the skillful articulation of anatomical structures, as well as to discuss the significance of anatomical knowledge within their future vocation as medical practitioners. Throughout the practical sessions, the instructor supervises and assesses the active involvement of students in carrying out the assigned exercises. Seminars demand dynamic discussions on the designated topics. During the course, knowledge is consistently evaluated through five periodic assessments (midterm exams), each

comprising of a practical segment on specimens, as well as an oral component. The schedule and course content are predetermined by the curriculum.

## List of assigned reading:

Friedrich Paulsen, Tobias M. Böckers, Jens Waschke: Sobotta Anatomy Textbook, 1st Edition
Atlas of Anatomy (Sobotta or Gilroy)

## List of optional reading:

1. Richard L. Drake, A. Wayne Vogl, Adam W.M. Mitchell: Gray's Anatomy, third edition
2. Kieth L. Moore: Clinically Oriented Anatomy, seventh edition, 2013.

## Curriculum:

### [Predavanja] list (with titles and explanation):

**P1: Bones of the shoulder girdle. Humerus. (pg.145-146, 150)**

Students will orientate and describe bones, describe specific parts of bones and show each bone structure.

**P2: Bones of the forearm. Bones of hand. (pg. 156, 159-160)**

Students will orientate and describe bones, describe specific parts of bones and show each bone structure.

**L1,2: Architecture of the human body. Anatomical Terms. Skeletal System**

Students will learn what regional and systemic anatomy is, students will explain what standard anatomical position is, anatomical planes and terms for location and orientation. Students will be able to define two subgroups of the skeleton, enumerate the types and the functions of cartilage, describe bone function, differentiate two types of bone, classify bones by shape, and describe how bone is structured and the vascularization and innervation of bones. Students will explain the development of the bones.

**L3,4: Joints**

Students will define two categories of joints, synovial joints and solid joints, describe synovial joints based on shape and movement, divide solid joints and describe their representatives.

**L5,6: Overview of the muscular system**

Define myology as an anatomical discipline. Explain the parts, structure and function of skeletal muscle. Divide the types of skeletal muscles. Describe the muscle and tendon spindle, motor plate, muscle innervation. Explain the function of the muscles in the joint. Describe the fascia.

**L7,8: Topographical and clinical anatomy of the upper extremity**

Define topographical anatomy as an anatomical discipline. Define skeletotopy, syntopy, holotopia. Define the topographical regions of the upper extremity. Explain the importance of clinical anatomy in the practical work of doctors. Describe the fossa axillaris and cubitalis regions.

**L9,10: Basics of angiology. Lymph vessels. Lymphatic system.**

Define angiology as an anatomical discipline. Explain the structure and anatomical characteristics of blood vessels. Describe the small and large circulation of blood. Outline the main arteries and veins. Describe lymphatic vessels and nodes.

**L11,12: Articulatio genus. Clinical lecture**

Describe the knee joint and explain its mechanics. Describe knee joint injuries and their treatment.

**L13,14: Overview of the organs of the nervous system. Peripheral nervous system.**

Define the nervous system, nervous tissue and nerve cell. Define the peripheral nervous system and describe the structures that make it up: nerve and ganglion. Describe the plexus brachialis and n. medianus. Describe the plexus lumbalis and n. ischiadicus. Distinguish between motor and sensory innervation.

**L15,16: Innervation of the lower limb. Topographic regions.**

Discuss the importance of topographical anatomy of the lower extremity, regional boundaries and content.

**L17,18: Introduction to the anatomy of the central nervous system.**

Explain the division and structure of the central nervous system. Describe the nerve cell, types of nerve cells and supporting cells. Define a nerve and state the division. Explain the development and division of the brain.

**L13,14: Overview of the organs of the nervous system. Peripheral nervous system.**

Define the nervous system, nervous tissue and nerve cell. Define the peripheral nervous system and describe the structures that make it up: nerve and ganglion. Describe the plexus brachialis and n. medianus. Describe the plexus lumbalis and n. ischiadicus. Distinguish between motor and sensory innervation.

**L15,16: Innervation of the lower limb. Topographic regions.**

Discuss the importance of topographical anatomy of the lower extremity, regional boundaries and content

**L17,18: Introduction to the anatomy of the central nervous system**

Explain the division and structure of the central nervous system. Describe the nerve cell, types of nerve cells and supporting cells. Define a nerve and state the division. Explain the development and division of the brain.

**L19,20: Examination of the bones of the head. Channels of the temporal bone. Cavum tympani.**

Outline the bones that belong to the axial axial skeleton. Divide the bones of the head into the cerebral and visceral parts and into the base and calvaria. Describe the basic principle of head bone development with reference to the importance of the fontanel. Describe the parts of the temporal bone and its canals as well as the cavum tympani.

**L21,22: Cavities of the viscerocranium**

Describe the walls of the eye, nose and mouth cavity. Explain the relationships and communications of the cavities with other spaces of the head. Describe the paranasal sinuses and their connection with the nasal cavity.

**L23,24: Overview of the axial skeleton. Spine. Medulla spinalis**

Outline the bones that belong to the axial axial skeleton. Describe the spine as a whole and list the types of joints between the vertebrae and describe the mobility of individual sections of the spine. Describe the external shape and internal structure of the spinal cord. Describe the segmentation with regard to the exits of the spinal nerves and relate it to the internal structure.

**L25,26: Cerebral nerve nuclei. Examination of the cranial nerves.**

Show an overview of cranial nerves with reference to their functional division, cores, exits and area of innervation.

**L27,28: Sheaths and blood vessels of the brain and spinal cord.**

Describe the connective sheaths of the brain and spinal cord. Describe the shape, position and function of the free sheets of the dura mater. Describe the venous sinuses of the dura mater. Describe the largest cisterns in the cranial cavity. Describe the communication between the ventricles and the subarachnoid space and the circulation of the cerebrospinal fluid. Describe the lumbar cistern and the practical importance of knowing its position during lumbar puncture.

**L29,30: Overview of the head and neck regions.**

Students will learn the topography and content of head and neck region.

**L31,32: Cranial Nerves: Functional Components, General Function**

Students will learn how to describe cranial nerves.

**L33,34: Nose.Larynx.**

Students will learn about nose structure, its relation to adjacent areas, irigation and innervation. Students will learn to describe the larynx, its relatuion to adjacent organs, irrigation and innervation.

**L35,36: Neck overwiev, Surface anatomy of the neck, Muscles, fascia, regions.**

Students will learn the surface anatomy of neck, its groups of muscles, layers of neck fascia and its organization, the regions of the neck.

**L37,38: Bulbus oculi.**

Students will learn to describe the walls of the eyeball, anterior and posterior chambers, the lens and vitreous body.

**L39,40: Internal ear.**

Students will learn about structure of internal ear, bony and membranaceous parts.

**L41,42: General Description of the Thorax. Lungs. Pleural Cavities. Pleura.**

Students will give an overview of the thoracic cavity, its walls, its compartments and the content; students will describe the lungs, pleura and pleural cavities.

**L43,44: Mediastinum. Heart.**

Students will describe the mediastinum with its walls and content; students will describe the heart and pericardium

**L45,46: Abdomen: General Description, Surface Topography – Nine-region Pattern, Walls, Abdominal and Peritoneal Cavity, Relation to Other Regions.**

Students will define the abdominal and peritoneal cavity and use surface topography for orientation of abdominal viscera.

**L47,48: Arrangement of Abdominal Viscera in the Adult, Abdominal Viscera Development.**

Students will learn about abdominal viscera development to understand the final arrangement of abdominal organs

**L49,50: Retroperitoneal Region: Posterior Abdominal Wall and Organs, Abdominal Aorta, Inferior Vena Cava, Lymphatic System**

Students will describe the posterior abdominal wall, the definition of retroperitoneal space and its content.

**L51,52: Pelvis: General Description, Pelvic Walls and Floor, Pelvic Cavity.**

Students will learn the general overview of the pelvis, the pelvic walls, and the content of the pelvic cavity and the general topography of the pelvic organs.

**L53,54: Internal Genital Organs – In Men and in Women.**

Students will learn how to describe male and female internal genital organs.

**L55,56: Visceral Innervation of Abdomen – Sympathetic and Parasympathetic Parts of the Autonomic Division of the Peripheral Nervous System.**

Students will describe sympathetic trunks, preganglionic and postganglionic sympathetic fibres and visceral afferent fibres, splanchnic nerves, abdominal prevertebral plexus, parasympathetic innervation and the enteric system

## Student obligations:

1. Regular attendance at classes (lectures, seminars, practicals).

2. Preparation for seminars and practicals by studying certain teaching content according to the implementation curriculum.

3. Use of protective equipment and instruments: mandatory use of a protective coat (white), anatomical tweezers and probe, optional use of protective latex gloves, mask, visor, or protective glasses and cap. Please properly dispose of the used work equipment in the designated place. Do not bring food and drink into the anatomy classrooms.

4. Careful handling of anatomical specimens and spaces where all forms of teaching take place.

5. It is forbidden to take photographs, take specimens outside the premises of the Institute of Anatomy, and alienate anatomical specimens and instruments of the Anatomy Department. A disciplinary procedure will sanction any misconduct.

6. Adherence to good academic behavior practices in dealing with fellow students, staff, and the Department of Anatomy teachers.

7. It is compulsory to follow and act by notifications and rules regarding attendance, absence, midterm exams, corrections of midterm exams, final exams, etc., which will be presented at the first lecture.

## Exam (exam taking, description of the written/oral/practical part of the exam, point distribution, grading criteria):

Student grading will be conducted according to the current Ordinance on Studies of the University of Rijeka(approved by the Senate) and the Ordinance on Student Grading at the Faculty of Medicine in Rijeka(approved by the Faculty Council).

During the classes of Anatomy, a student can achieve a maximum of 50% (50 points) of their final grade, while the remaining 50% (50 points) of the grade is obtained at the final exam, as follows:

| | |
|---|---|
| Midterm exam I - MS | 6 points |
| Midterm exam II - MI | 6 points |
| Midterm exam III - CR/CNS | 10 points |
| Midterm exam IV - CC | 14 points |
| Midterm exam V - AT | 14 points |
| Total (classes) | 50 points |
| Final exam | 50 points |
| Total (course) | 100 points |

**A. Midterm exams** consist of a practical and an oral part. The practical part is evaluating the knowledge of anatomical specimens, assessing the practical skills of finding and showing anatomical structures, as well as knowledge of the Latin nomenclature of anatomical structures. On a practical part, students must **recognize at least 8 out of 10 structures** to pass. **The bone orientation is an obligatory practical question and can not be failed.** Passing the practical part of the midterm is a prerequisite for joining the oral part of the midterm. Each part must be evaluated positively to pass the midterm exam! If a student does not approach the oral part after completing the practical part, the whole midterm is marked as 'insufficient (1).

Midterm exams are evaluated according to the table:

| | PRACTICAL AND ORAL | |
|---|---|---|
| | grade | points |
| UPPER EXTREMITY - MS | excellent (5)<br>very good (4)<br>good (3)<br>sufficient (2)<br>insufficient (1) | 6<br>5<br>4<br>3<br>0 |
| LOWER EXTREMITY - MI | excellent (5)<br>very good (4)<br>good (3)<br>sufficient (2)<br>insufficient (1) | 6<br>5<br>4<br>3<br>0 |
| CRANIUM, CENTRAL NERVOUS SYSTEM – CR/CNS | excellent (5)<br>very good (4)<br>good (3)<br>sufficient (2)<br>insufficient (1) | 10<br>8<br>7<br>5<br>0 |

| | | |
|---|---|---|
| HEAD AND NECK - CC | excellent (5)<br>very good (4)<br>good (3)<br>sufficient (2)<br>insufficient (1) | 14<br>12<br>10<br>7<br>0 |
| THORAX, ABDOMEN AND PELVIS - AT | excellent (5)<br>very good (4)<br>good (3)<br>sufficient (2)<br>insufficient (1) | 14<br>12<br>10<br>7<br>0 |

The Midterm exams will be held on the dates noted below. The exact time and the venues will be announced later.

- **MIDTERM 1 (upper extremity) – 29/10/2024 and 31/10/2024**
- **MIDTERM 2 (lower extremity) – 03/12/2024 and 05/12/2024**
- **MIDTERM 3 (cranium, CNS) – 29/01/2024**
- **MIDTERM 4 (head and neck) – 14/04/2025**
- **MIDTERM 5 (thorax, abdomen, and pelvis) – 03/06/2025 and 05/06/2025**

**Corrections of the midterm exams**

Students can access the corrections of the midterm exams if they did not pass them during the regular midterm, or are not satisfied with the obtained points. If a student retakes the midterm exam because they are unsatisfied with the obtained grade points, only the grade points received at the retaken midterm exam(s) will be considered valid. Suppose the student passes the practical part of the midterm exam during the regular midterm and fails the oral part. In that case, he can retake the oral part of the midterm separately, without redoing the practical part. Students can correct each midterm exam (I – V) during the retake exam dates only once!

**The dates of retake midterm exams are following:**

**14.02.2025., 27.02.2025., 11.06.2025., 26.06.2025. and 10.07.2025.**

On these dates, students can apply for any midterm exam regardless of the topic and apply for more than one retake exam on each date. Students are obligated to apply for the correction/s of the midterm exams.  Suppose students apply for the correction/s of the midterm exam and decide that they will not be able to access it. In that case, they must personally cancel it (via email or in-person at the Department's administrator's office)  at the latest until one work day before the term of the midterm exam/s until noon. If a student does not personally cancel the application for the correction/s of the midterm exams, and then doesn't approach the midterm correction/s, their final score for that/those midterm exams will be 0 points.

**B. Final exam**

Only students who have achieved at least 25 points during the course can take the final exam in Anatomy. Students with less than 25 points earned during the course must enroll in the course Anatomy again in the next academic year. If a student obtains 25 grade points during classes, but without passing one or more midterm exams, he must approach the practical parts of those midterm exams during the final exam. Passing all practical parts is one of the prerequisites for taking the final exam. In case the student does not pass the practical during the final exam, the exam is graded as insufficient. The final exam is oral.

The final exam is evaluated according to the scheme:

| Grade | Points |
|---|---|
| Excellent (5) | 50 |
| Very good (4) | 41 |
| Good (3) | 33 |
| Sufficient (2) | 25 |

The final grade consists of the sum of points gained during the course and at the final oral exam. Grading within the ECTS grading system is carried out with an absolute distribution, i.e. based on the final achievement:

A – 90 - 100% EXCELLENT (5)

B – 75 - 89,9% VERY GOOD (4)

C – 60 – 74,9% GOOD (3)

D -- 50 - 59,9% SUFFICIENT (2)

| Final exam dates | |
|---|---|
| 1. | 20.06.2025. |
| 2. | 04.07.2025. |
| 3. | 18.07.2025. |
| 4. | 05.09.2025. |
| 5. | 19.09.2025. |

## Other notes (related to the course) important for students:

**Academic honesty**

It is expected that all students and teachers follow the code of academic honesty in accordance with the Code of Ethics for the students of the Faculty of Medicine at the University of Rijeka.

**Consultations**

Consultations are organized in agreement with the teacher.

**Contact information**

For all questions and concerns, students are encouraged to contact us by e-mail (mia.medic@medri.uniri.hr; tanja.celic@medri.uniri.hr) or personally.

## COURSE HOURS 2022/2023

Anatomy

**[Predavanja]**
(Place and time or group)

## List of lectures, seminars and practicals:

| [PREDAVANJA] (TOPIC) | Number of hours | Location |
|---|---|---|
| P1: Bones of the shoulder girdle. Humerus. (pg.145-146, 150) | 2 | |
| P2: Bones of the forearm. Bones of hand. (pg. 156, 159-160) | 1 | |
| L1,2: Architecture of the human body. Anatomical Terms. Skeletal System | 2 | |
| L3,4: Joints | 2 | |
| L5,6: Overview of the muscular system | 2 | |
| L7,8: Topographical and clinical anatomy of the upper extremity | 2 | |
| L9,10: Basics of angiology. Lymph vessels. Lymphatic system. | 2 | |
| L11,12: Articulatio genus. Clinical lecture | 2 | |
| L13,14: Overview of the organs of the nervous system. Peripheral nervous system. | 2 | |
| L15,16: Innervation of the lower limb. Topographic regions. | 2 | |
| L17,18: Introduction to the anatomy of the central nervous system. | 2 | |
| L13,14: Overview of the organs of the nervous system. Peripheral nervous system. | 1 | |
| L15,16: Innervation of the lower limb. Topographic regions. | 2 | |

| | | |
|---|---|---|
| L17,18: Introduction to the anatomy of the central nervous system | 2 | |
| L19,20: Examination of the bones of the head. Channels of the temporal bone. Cavum tympani. | 2 | |
| L21,22: Cavities of the viscerocranium | 2 | |
| L23,24: Overview of the axial skeleton. Spine. Medulla spinalis | 2 | |
| L25,26: Cerebral nerve nuclei. Examination of the cranial nerves. | 2 | |
| L27,28: Sheaths and blood vessels of the brain and spinal cord. | 2 | |
| L29,30: Overview of the head and neck regions. | 2 | |
| L31,32: Cranial Nerves: Functional Components, General Function | 2 | |
| L33,34: Nose.Larynx. | 2 | |
| L35,36: Neck overwiev, Surface anatomy of the neck, Muscles, fascia, regions. | 2 | |
| L37,38: Bulbus oculi. | 2 | |
| L39,40: Internal ear. | 2 | |
| L41,42: General Description of the Thorax. Lungs. Pleural Cavities. Pleura. | 2 | |
| L43,44: Mediastinum. Heart. | 2 | |
| L45,46: Abdomen: General Description, Surface Topography – Nine-region Pattern, Walls, Abdominal and Peritoneal Cavity, Relation to Other Regions. | 2 | |
| L47,48: Arrangement of Abdominal Viscera in the Adult, Abdominal Viscera Development. | 2 | |
| L49,50: Retroperitoneal Region: Posterior Abdominal Wall and Organs, Abdominal Aorta, Inferior Vena Cava, Lymphatic System | 2 | |
| L51,52: Pelvis: General Description, Pelvic Walls and Floor, Pelvic Cavity. | 2 | |
| L53,54: Internal Genital Organs – In Men and in Women. | 2 | |
| L55,56: Visceral Innervation of Abdomen – Sympathetic and Parasympathetic Parts of the Autonomic Division of the Peripheral Nervous System. | 2 | |

**EXAM DATES (final exam):**