[Medicinski fakultet u Rijeci]

**Curriculum**
**2024/2025**

[Za kolegij]

# Radiology

| | |
|---|---|
| Study program: | **Medical Studies in English (R)**<br>[Sveučilišni integrirani prijediplomski i diplomski studij] |
| Department: | **[Katedra za radiologiju]** |
| Course coordinator: | **prof. dr. sc. Miletić Damir, dr. med., redoviti profesor u trajnom zvanju** |
| Year of study: | **4** |
| ECTS: | **3.5** |
| Incentive ECTS: | **0 (0.00%)** |
| Foreign language: | **Possibility of teaching in a foreign language** |

## Course information:

Course objective is to teach medical students the fundamental principles of diagnostic radiology and image-guided interventions for clinically important and common disorders in different clinical settings. It includes basics of radiation physics, radiation protection, imaging modalities and use of contrast media in different radiological modalities. Course of Radiology aims to explain typical imaging patterns and features and to train students typical radiological features on clinical cases: consolidations, nodules, hyperlucencies, hyperinflation, air bronchogram in thoracic imaging; microcalcifications and masses in breast imaging; filling defects, outpouchings, obstructions, stenoses in gastrointestinal imaging; cystic and solid focal lesions on cross-sectional imaging modalities; osteolysis, sclerosis and periosteal reaction in musculoskeletal imaging; mass effect, haemorrhagic and ischaemic lesions in neuroradiology; occlusions, pathologic vessels, aneurysms, dissections in vascular imaging; patterns of contrast imbibition and others. Common indications, contraindications and limitations of different imaging techniques should be discussed for each organ system. Another objective is to explain the value of radiological examinations in different clinical settings in context of evidence-based medicine. Along with diagnostic radiology procedures, students should observe basic interventional procedures such as catheterization techniques and arteriographies, image-guided biopsy sampling and drainages.

## List of assigned reading:

1.Elsayes KM, Oldham SAA. Introduction to Diagnostic Radiology. McGraw-Hill Education, 2014.

2. Mettler FA. Essentials of Radiology, Fourth Edition. Elsevier 2019.

## List of optional reading:

Chen MYM, Pope TL, Ott DJ. Basic Radiology, 2nd Edition, McGraw-Hill Companies, 2011.

## Curriculum:

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

**Lecture 1: X-ray**

To list the components of an X-ray unit and explain the process of X-ray generation • To describe principles of fluoroscopy and its common indications • To list and describe factors affecting image quality and dose in radiography and fluoroscopy • To describe the relative value of a radiographic examination for various organ systems and indications • To describe the principles of soft tissue radiography in mammography • To describe positioning of the patient for common radiographic techniques (e.g. chest X-ray) • To describe normal anatomy of various organs on radiographic images • To explain the concept of spatial, temporal and contrast resolution • To explain the principle of contrast in different imaging modalities

**Lecture 2: Computed tomography (CT)**

Learning outcomes:

To explain physical basis of image formation on computed tomography • To describe the scale of Hounsfield units (HU) and the principle of window/level concept • To list normal attenuation coefficients of various tissues/materials and common pathologies (e.g. hemorrhage, calcifications) • To describe the normal anatomy of various organs on CT • To describe relative diagnostic value of computed tomography (CT) examination of various organ systems and common clinical indications • To understand the rationale for application of intravenous contrast and to describe contrast distribution in body tissues • To define advantages and shortcomings of CT examinations

**Lecture 3: Magnetic resonance imaging (MRI); ultrasound (US)**

Learning outcomes:

To explain the relative value of a magnetic resonance imaging (MRI) examination for the various organ systems and indications • To describe the basic principles of image formation with MRI • To recognize fundamental pulse sequences in MRI (including T2-weighted sequences, T1-weighted sequences, fat suppressed sequences, STIR, FLAIR, diffusion-weighted imaging) • To explain the safety issues in the MR environment with regard to patients and staff • To describe normal anatomy of various organs on MRI • To explain the relative value of an ultrasound examination for various organ systems and indications • To describe the basic principles of image generation on ultrasonography (US) and to list the tissue properties determining image features • To list the frequency of transmission and different types of transducers for various indications in US • To describe the principles of the Doppler effect • To describe normal anatomy of the various organs on ultrasonography • To be aware of the indications for contrast-enhanced ultrasonography

**Lecture 4: Digital subtraction angiography (DSA); Hybrid imaging; PACS**

**Learning outcomes:**

To describe principles of digital subtraction angiography (DSA) • To have a basic understanding of different types and techniques of image-guided interventions • To describe the basic infrastructure of imaging informatics, including Picture Archiving and Communication Systems (PACS) and Radiological Information Systems (RIS) and applications of Artificial Intelligence and Deep Learning to Radiology • To explain the relative value of hybrid imaging (PET/CT, PET/MRI) examinations for the various organ systems and indications • To recognize the radiological modality on images.

**Lecture 5: Basics, Stroke**

Learning outcomes:

To describe the normal anatomy and physiology of the brain, skull, skull base, spine, spinal cord, and nerve roots on cross-sectional imaging • To have a basic understanding of the main techniques used in neuroradiology; CT, MRI, radiography, DSA and ultrasonography • To list typical imaging features of ischemic and hemorrhagic stroke on cross-sectional imaging

**Lecture 6: Neurotrauma, inflammation, degeneration**

Learning outcomes:

To describe common imaging features of traumatic brain injury and spinal trauma on cross-sectional imaging • To list typical imaging features of white matter disease, inflammation, and neurodegeneration on cross-sectional imaging

**Lecture 7: Tumors of the brain and spine**

Learning outcomes:

To describe typical imaging features of the most common tumors of the brain and spine • To describe the anatomy and typical imaging features of pathologies of pontocerebellar angle • To describe the acute headache imaging management and typical imaging features of related diseases • To describe typical imaging features of the most common vascular diseases

**Lecture 8: Anatomy of the respiratory system**

Learning outcomes:

To describe main imaging techniques used in thoracic imaging • To understand common indications and limitations in thoracic imaging • To recognize differences between high resolution CT (HRCT) of the chest, staging CT of the chest, low dose screening CT

**Lecture 9: Basic imaging interpretation in chest diseases**

Learning outcomes:

To explain relevant signs in chest radiography (including silhouette sign, air bronchogram, air crescent sign, deep sulcus sign) • To recognize imaging patterns in chest radiology including consolidations, nodules, radiolucencies, hyperinflation • To list monitoring and support devices (“tubes and lines”) including endotracheal tubes, central venous catheters, nasogastric tubes, chest drains and pacemakers

**Lecture 10: Fundamental diseases of the pulmonary parenchyma**

Learning outcomes:

To describe typical imaging features of pneumonia on radiographs and CT • To explain typical imaging features of emphysema on radiographs and CT • To define typical imaging appearances of bronchogenic carcinoma and pulmonary metastases on radiographs and CT • To explain work-up of lung nodules • To recognize basic imaging patterns of interstitial lung disease

**Lecture 11: Pleura, chest wall and mediastinum**

Learning outcomes:

To list typical appearances and common causes of pleural effusion • To explain asbestos – related diseases and mesothelioma • To describe imaging features of pneumothorax and tension pneumothorax • To understand typical imaging patterns of mediastinal masses on radiographs and CT

**Lecture 12: Heart – imaging features**

Learning outcomes:

To describe normal cardiac size and contour • To explain increased heart size and altered contour • To describe imaging features of congestive heart failure and pulmonary edema • To describe basic imaging features of congenital heart disease

**Lecture 13: Fundamental diseases of the heart**

Learning outcomes:

To explain the role of radiology in cardiomyopathies • To recognize typical signs of coronary artery disease • To explain basics of valvular heart disease • To list imaging characteristics of pericardial disease

**Lecture 14: Vascular radiology**

Learning outcomes:

To define typical imaging features of acute aortic syndrome • To classify aortic dissection • To understand CT diagnostics of pulmonary thromboembolism • To describe imaging features of atherosclerotic disease • To explain the role of radiology in deep venous thrombosis

**Lecture 15: Interventional radiology (IR): vascular**

Learning outcomes:

To describe aortic interventions • To explain interventions in peripheral arterial disease • To define interventions on

aortic visceral branches • To describe carotid disease treatment and neurointerventions • To have a basic understanding of bleeding management

**Lecture 16: Upper gastrointestinal tract**

Learning outcomes:

To describe imaging modalities and normal anatomy of the pharynx, esophagus, stomach and duodenum • To describe esophageal diverticula, presbyesophagus, varices, hiatal hernia and GERD • To explain imaging characteristics of esophageal strictures and dilatation • To understand staging of esophageal cancer • To define imaging features of gastric and duodenal ulcer disease • To differentiate benign and malignant gastric ulcers • To describe typical imaging presentation of gastroduodenal tumors

**Lecture 17: Liver and biliary tract**

Learning outcomes:

To describe the normal anatomy and dual blood supply of the liver • To have a basic understanding of liver cirrhosis • To describe typical imaging features of liver cysts, primary and secondary tumors of the liver • To describe the normal anatomy of the biliary tract • To list typical imaging features of biliary calculosis, acute/chronic cholecystitis, and liver abscess • To have a basic understanding of biliary obstruction and jaundice

**Lecture 18: Pancreas and spleen**

Learning outcomes:

To describe the normal anatomy of the pancreas and spleen • To list typical imaging features of acute and chronic pancreatitis • To have a basic understanding of solid and cystic tumors of the pancreas • To describe typical imaging features of splenomegaly and splenic trauma

**Lecture 19: Small and large intestine**

Learning outcomes:

To describe the normal anatomy of the internal viscera, omentum, mesentery and peritoneum on conventional radiology, CT, ultrasound, and MRI • To list typical imaging features of colon tumors, diverticulitis, and inflammatory bowel diseases

**Lecture 20: Acute abdomen**

Learning outcomes:

To list typical imaging features of acute abdominal conditions, including perforation, hemorrhage, inflammation, infection, obstruction, ischemia and infarction on radiographs, ultrasound, and CT

**Lecture 21: MSK - Anatomy, Imaging modalities, Fractures/Trauma**

Learning outcomes:

To describe the normal anatomy and physiology of the musculoskeletal system • To list imaging modalities for detection of bone, joint, and muscle disorders • To understand advantages and shortcomings of different techniques in various MSK disorders

**Lecture 22: MSK - Degenerative, OCD, Osteomyelitis**

Learning outcomes:

To explain typical imaging features of skeletal trauma and stress fractures • To recognize degenerative changes on radiograph • To describe typical imaging features od (osteo)chondritis • To explain early and late signs of osteomyelitis

**Lecture 23: MSK - Rheumatoid disease, Tumors**

Learning outcomes:

To define typical imaging features of rheumatoid arthritis and seronegative spondyloarthropathies • To have a basic understanding of imaging characteristics to distinguish benign from malignant bone tumors

**Lecture 24: Pediatric radiology**

**Learning outcomes:** To describe normal pediatric anatomy and physiology and how it changes with age on conventional radiology, ultrasonography CT and MRI • To have a basic understanding of the main techniques (radiography, fluoroscopy, ultrasound, CT and MRI) used in pediatric imaging • To explain the increased vulnerability of children to ionizing radiation • To have a basic understanding of the typical imaging manifestations of accidental and non-accidental trauma • To list basic imaging features of the most common disorders of the brain, spine, chest, gastrointestinal tract and abdomen, urogenital system and musculoskeletal system in neonates, infants, children and adolescents

**Lecture 25: Urinary tract**

**Learning outcomes:** To describe the normal anatomy and physiology of the retroperitoneum, kidneys and male genital tract on ultrasonography and cross-sectional imaging • To have a basic understanding of the main techniques (radiography, intravenous pyelography, MICU, ultrasonography, CT and MRI) used in urogenital radiology

**Lecture 26: Kidney, Scrotum**

**Learning outcomes:** To list typical congenital abnormalities of the kidneys • To describe imaging characteristics of cystic and solid masses of the renal parenchyma • To have a basic knowledge of renal infection and its complications • To explain the role if imaging in testicular or scrotal pain and palpable masses

**Lecture 27: Ureters, Bladder, Prostate**

**Learning outcomes:** To describe the normal anatomy of ureters, bladder, and urethra • To explain the role of imaging in the obstructive uropathy • To list typical imaging features of the most common pathologies of the prostate and seminal vesicles

**Lecture 28: Head and Neck (H&N) radiology**

**Learning outcomes:** To describe the normal anatomy and physiology of the head and neck on cross-sectional imaging • To have a basic understanding of the main techniques used in head and neck imaging • To describe common imaging manifestations of trauma, inflammation and infection of the head and neck region • To describe typical imaging manifestations of tumors of the head and neck region

**Lecture 29: Breast radiology**

**Learning outcomes:** To describe the normal anatomy and physiology of the female breast with aging • To have a basic understanding of radiological techniques employed in breast imaging, their indications and relative diagnostic value • To recognize common benign lesions and cancer on mammography • To describe the appearance of common breast pathologies on ultrasound • To have a basic understanding of MRI of the breast • To differentiate between screening mammography and workup of an abnormality

**Lecture 30: Interventional radiology (IR): non-vascular**

**Learning outcomes:** To describe imaging-guided biopsies and drainages of deep collections • To have a basic knowledge of tumor ablation techniques • To describe percutaneous biliary interventions • To understand HCC treatment and transjugular intrahepatic portosystemic shunt (TIPSS).

**[Vježbe] list (with titles and explanation):**

**P1-4 Imaging modalities, radiological anatomy, nomenclature**

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**P5-7 Neuroradiology**

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**P8-11 Thoracopulmonary radiology**

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**P12-15 Cardiovascular imaging and intervention**

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**P16-17 Upper gastrointestinal and hepatobiliary tract**

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**P18-20 Pancreas, small and large intestine, acute abdomen**

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**P21-23 Musculoskeletal radiology**

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**P24-27 Pediatric radiology, urinary tract**

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**P28-29 H&N radiology, breast**

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**P 30: IR**

IR

**[Seminari] list (with titles and explanation):**

**Seminar 1A: Orbit**

Learning outcomes: To describe the normal anatomy of the orbit and sellar region • To list imaging features of orbital masses • To recognize orbital cellulitis and abscess.

**Seminar 3A: Pituitary gland**

Learning outcomes: To define anatomy and imaging characteristics of pituitary gland • To have a basic knowledge of sellar tumors • To define criteria for microadenomas and macroadenomas • To discuss compression on adjacent anatomic structures.

**Seminar 6B: Radiation hazards and protection**

Learning outcomes: To understand the concept of deterministic and stochastic effects • To explain justification and optimization of radiological examination • To have a basic knowledge of radiation doses in diagnostic imaging • To describe radiation risks in pregnancy and childhood.

**Seminar 2B: Joints of the lower extremity: hip, knee (x-ray, MRI**

Learning outcomes: • To define the differences between degenerative and inflammatory lesions on imaging • To list typical degenerative changes of the hip on radiograph, CT and MRI • To describe athletic injuries of the knee • To understand the role of osteophytes in spine radiology.

**Seminar 3B: Head trauma**

Learning outcomes: To define the role of CT and MRI in patients with head trauma • To describe skull fractures • To discuss intracranial hemorrhage caused by traumatic injury • To explain the importance of cerebral herniation.

**Seminar 5B: Radiology in personalized medicine**

Learning outcomes: To define imaging biomarkers and thir role in personalized treatment approach • To give examples of molecular Imaging and individually tailored treatments• To discuss potential benefits of radiology in personalized medicine.

**Seminar 4A: Stroke**

Learning outcomes: To comment the role of brain CT in patients with stroke • To understand diagnostic information obtained from CT angiograph and CT perfusion • To describe MR features of stroke • To distinguish cerebral hypoperfusion from infaction.

**Seminar 7A: Imaging guided biopsies/drainages**

Learning outcomes: To describe sonographically guided needle biopsies • To discuss CT-guided interventional procedure in thorax • To understand indications, advantages, and complications of imaging guided percutaneous abscess drainage.

**Seminar 7B: Jaundice (the role of radiology)**

Learning outcomes: To describe imaging of the biliary tract by use of CT and MR modalities • To describe the role of radiology in biliary obstruction • To explain the role of MDCT in acute biliary disorders.

**Seminar 5A: Craniofacial trauma**

Learning outcomes:  To describe blow out fracture of the orbit and its clinical importance • To list facial fractures including nasal, zygomatic and Le Fort fractures • To have a basic knowledge of mandibular and dentoalveolar fractures.

**Seminar 9A: Joints of the upper extremity: shoulder, ebow, (x-ray, MRI)**

Learning outcomes: To discuss different imaging modalities in osteoarthritis • To describe imaging features of degenerative schoulder and elbow • To have a general knowledge of typical MRI findings in elbow disorders • To explain MR signs of rotator cuff injury.

**Seminar 10B: Obstructive uropathy**

Learning outcomes: To list imaging modalities for evaluation of obstructive uropathy • To define imaging strategies in patients with hematuria • To understand advanceses and limitations of different imaging modailites in patients with hematuria.

**Seminar 8B: Gynaecological cancer: ovary**

Learning outcomes: To describe MRI anatomy of the ovary and Fallopian tubes • To discuss MR criteria for characterization of benign and suspicios ovarian masses • To define typical imaging features of ovarian cancer.

**Seminar 9B: Lymphoma**

Learning outcomes:  To describe imaging features of neck, thoracic, abdominal, gastrointestinal and spine lymphoma • To define criteria for staging lymphoma • To list response criteria for non-Hodgkin ymphoma and Hodgkin lymphoma.

**Seminar 10A: Gynaecological cancer: uterus**

Learning outcomes:  To describe MRI anatomy of the uterus • To have a basic knowledge of MRI staging of cervical cancer • To define the depth of myometrial invasion in endometrial carcinoma.

**Seminar 6A: Adrenal imaging**

Learning outcomes:  To explain radiological anatomy of the suprarenal glands on CT and MRI • To define suprarenal adenoma in terms of diagnostics, clinical relevance, and differential diagnosis • To list other suprarenal tumors including imaging characteristics.

**Seminar 1B: Extra axial brain tumors**

Learning outcomes: • To classify extra-axial masses • To describe typical imaging characteristics of menigeoma • To have a basic knowledge of the tumors of cranial nerves.

**Seminar 2A: Contrast media in radiology**

Learning outcomes: • To understand indications, modalities of application, diagnostic purpose, and adverse reactions of iodinated contrast agents: • To discuss clinical utility and potential harm of gadolinium-based contrast media • To have a basic knowledge of ultrasound contrast agents.

**Seminar 4B: Radiology in blunt polytrauma (body)**

Learning outcomes: To list typical clinical indications for the whole-body CT examination • To understand technical performance and challenges • To define imaging features of life-threatening traumatic lesions • To describe typical viscerocranium injury, thoracic and abdominal blunt trauma.

**Seminar 8A: Radiology in COVID patients**

Learning outcomes: • To recognize typical imaging features in the lung parenchyma on x-ray and CT • To explain the role of radiology in potential complications and co-morbidities in patinets with COVID disease.

## Student obligations:

1. Attending all forms of classes.
2. Preparing and presenting seminars in front of colleagues and teachers with topic discussion.
3. Active participation in practicals with prior theoretical preparation, practical use of theoretical knowledge
4. Taking written and oral exam.

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

Evaluation is structured in accordance with the regulations for students' evaluation at the Faculty of Medicine, University of Rijeka.

Students' activities and work will be evaluated **during the course and in the final exam**. Out of a total of 100 points, a student can earn 50 points during classes and the remaining 50 points on the final exam.

Out of the maximum 50 grade points which can be obtained during classes, the student must collect at least 25 (50%) grade points to take the final exam.

The student acquires grade points by preparing the **seminar** and **during practicals** where theoretical knowledge, practical application on images, recognition of the type of examination and typical radiological signs, connection of radiological concepts with clinical data, interest and activity are assessed.

During classes, a student can earn a maximum of 50 grade points.

The student's seminar work is evaluated in the range of 3 to 10 points. A student can achieve a maximum of 10 grade points with a seminar.

The **activity** in the exercises is evaluated according to the achievement of clinical skills, which are checked continuously during the rotation of a particular group of students. Class activity, understanding of basic radiological terms, demonstration a radiological method in the image, demonstration and description of typical anatomical and pathological characteristics of organs and tissues are evaluated. In this category, a student can achieve a maximum of 40 points (range 15-40 points).

According to the regulations, students who have obtained at least 25 or more points (25-50 points) can take the final exam.

At the final exam, the student receives 50% of the final grade. The final exam consists of a **written** knowledge test and an **oral** knowledge test (theoretical and practical knowledge test on radiological images) from all course topics.

In the **written exam**, the student gains a maximum of 20 grade points (range 7-20).

In the **oral exam**, the student can obtain a maximum of 30 points (range 10-30).

The **final grade** represents the sum of points during classes and on the final exam, expressed by the corresponding numerical grade, letter of the alphabet and percentage.

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

All educational content for students will be available at the Merlin platform.

## COURSE HOURS 2024/2025

Radiology

| **[Predavanja]**<br>(Place and time or group) | **[Vježbe]**<br>(Place and time or group) | **[Seminari]**<br>(Place and time or group) |
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| **05.05.2025** | | |
| Lecture 1: X-ray:<br>• [P12 - KBC SUŠAK] (08:00 - 11:15) [167]<br>  ◦ R_348<br><br>Lecture 2: Computed tomography (CT):<br>• [P12 - KBC SUŠAK] (08:00 - 11:15) [167]<br>  ◦ R_348<br><br>Lecture 3: Magnetic resonance imaging (MRI); ultrasound (US):<br>• [P12 - KBC SUŠAK] (08:00 - 11:15) [167]<br>  ◦ R_348<br><br>Lecture 4: Digital subtraction angiography (DSA); Hybrid imaging; PACS:<br>• [P12 - KBC SUŠAK] (08:00 - 11:15) [167]<br>  ◦ R_348 | P1-4 Imaging modalities, radiological anatomy, nomenclature:<br>• [ONLINE] (12:15 - 15:15) [277]<br>  ◦ Ra-A<br>  ◦ Ra-E<br>• [KBC Rijeka - Radiologija] (12:15 - 15:15) [287]<br>  ◦ Ra-F<br>  ◦ Ra-G<br>• [KBC SUŠAK-RADIOLOGIJA] (12:15 - 15:15) [167]<br>  ◦ Ra-B<br>• [KBC SUŠAK-RADIOLOGIJA] (15:30 - 18:30) [167]<br>  ◦ Ra-D<br>• [KBC Rijeka - Radiologija] (15:30 - 18:30) [281]<br>  ◦ Ra-C<br>  ◦ Ra-H | |
| Grubešić Tiana, dr. med., asistentica [287] · doc. dr. sc. Kovačić Slavica, dr. med. [277] · prof. dr. sc. Miletić Damir, dr. med., redoviti profesor u trajnom zvanju [167] · izv. prof. dr. sc. Valković Zujić Petra, dr. med. [281] | | |
| **08.05.2025** | | |
| Lecture 12: Heart – imaging features:<br>• [P12 - KBC SUŠAK] (08:00 - 10:15) [277]<br>  ◦ R_348<br><br>Lecture 13: Fundamental diseases of the heart:<br>• [P12 - KBC SUŠAK] (08:00 - 10:15) [277]<br>  ◦ R_348<br><br>Lecture 14: Vascular radiology:<br>• [P12 - KBC SUŠAK] (08:00 - 10:15) [277]<br>  ◦ R_348<br><br>Lecture 15: Interventional radiology (IR): vascular:<br>• [P12 - KBC SUŠAK] (10:30 - 11:15) [167]<br>  ◦ R_348 | P12-15 Cardiovascular imaging and intervention:<br>• [KBC SUŠAK-RADIOLOGIJA] (12:15 - 15:15) [277]<br>  ◦ Ra-E<br>  ◦ Ra-D<br>• [KBC Rijeka - Radiologija] (12:15 - 15:15) [2306]<br>  ◦ Ra-F<br>• [KBC SUŠAK-RADIOLOGIJA] (15:30 - 18:30) [277]<br>  ◦ Ra-B<br>  ◦ Ra-A<br>• [ONLINE] (15:30 - 18:30) [1437]<br>  ◦ Ra-H<br>  ◦ Ra-C<br>• [KBC Rijeka - Radiologija] (15:30 - 18:30) [2306]<br>  ◦ Ra-G | |
| doc. dr. sc. Kovačić Slavica, dr. med. [277] · naslovni asistent Madunić Mateo, dr. med. [2306] · prof. dr. sc. Miletić Damir, dr. med., redoviti profesor u trajnom zvanju [167] · doc.dr.sc. Tkalčić Lovro, dr.med. [1437] | | |
| **12.05.2025** | | |

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| Lecture 8: Anatomy of the respiratory system:<br>• [P12 - KBC SUŠAK] (08:00 - 11:15) [167]<br>◦ R_348<br><br>Lecture 9: Basic imaging interpretation in chest diseases:<br>• [P12 - KBC SUŠAK] (08:00 - 11:15) [167]<br>◦ R_348<br><br>Lecture 10: Fundamental diseases of the pulmonary parenchyma:<br>• [P12 - KBC SUŠAK] (08:00 - 11:15) [167]<br>◦ R_348<br><br>Lecture 11: Pleura, chest wall and mediastinum:<br>• [P12 - KBC SUŠAK] (08:00 - 11:15) [167]<br>◦ R_348 | P8-11 Thoracopulmonary radiology:<br>• [KBC Rijeka - Radiologija] (12:15 - 15:15) [2306]<br>◦ Ra-B<br>◦ Ra-E<br>• [KBC SUŠAK-RADIOLOGIJA] (12:15 - 15:15) [286]<br>◦ Ra-A<br>◦ Ra-H<br>• [ONLINE] (12:15 - 15:15) [167]<br>◦ Ra-F<br>◦ Ra-G<br>• [KBC Rijeka - Radiologija] (15:30 - 18:30) [2306]<br>◦ Ra-D<br>• [KBC SUŠAK-RADIOLOGIJA] (15:30 - 18:30) [286]<br>◦ Ra-C | |
| naslovni asistent Madunić Mateo, dr. med. [2306] · prof. dr. sc. Miletić Damir, dr. med., redoviti profesor u trajnom zvanju [167] · naslovni viši asistent Nadarević Tin, dr. med. [286] | | |
| **15.05.2025** | | |
| Lecture 5: Basics, Stroke:<br>• [P11 - KBC RI] (08:00 - 10:30) [1854]<br>◦ R_348<br><br>Lecture 6: Neurotrauma, inflammation, degeneration:<br>• [P11 - KBC RI] (08:00 - 10:30) [1854]<br>◦ R_348<br><br>Lecture 7: Tumors of the brain and spine:<br>• [P11 - KBC RI] (08:00 - 10:30) [1854]<br>◦ R_348 | P5-7 Neuroradiology:<br>• [KBC SUŠAK-RADIOLOGIJA] (12:30 - 14:45) [1311]<br>◦ Ra-E<br>• [P11 - KBC RI] (12:30 - 14:45) [1854]<br>◦ Ra-F<br>◦ Ra-A<br>• [ONLINE] (14:00 - 16:15) [2763]<br>◦ Ra-B<br>◦ Ra-C<br>• [P11 - KBC RI] (15:15 - 17:30) [1854]<br>◦ Ra-H<br>◦ Ra-D<br>• [KBC SUŠAK-RADIOLOGIJA] (15:15 - 17:30) [1311]<br>◦ Ra-G | Seminar 1A: Orbit:<br>• [P11 - KBC RI] (10:45 - 11:30) [1854]<br>◦ R_348<br><br>Seminar 1B: Extra axial brain tumors:<br>• [P11 - KBC RI] (10:45 - 11:30) [1854]<br>◦ R_348 |
| Brumini Ivan, dr. med. [2763] · naslovna asistentica Miletić Rigo Dina, dr. med. [1311] · prof. dr. sc. Rumboldt Zoran, dr. med. [1854] | | |
| **19.05.2025** | | |

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| Lecture 16: Upper gastrointestinal tract:<br>• [P12 - KBC SUŠAK] (08:00 - 08:45) [281]<br>  ◦ R_348<br><br>Lecture 17: Liver and biliary tract:<br>• [P12 - KBC SUŠAK] (08:45 - 09:30) [167]<br>  ◦ R_348 | P16-17 Upper gastrointestinal and hepatobiliary tract:<br>• [ONLINE] (15:45 - 17:15) [167]<br>  ◦ Ra-H<br>  ◦ Ra-C<br>• [KBC SUŠAK-RADIOLOGIJA] (15:45 - 17:15) [287]<br>  ◦ Ra-B<br>  ◦ Ra-E<br>• [KBC Rijeka - Radiologija] (15:45 - 17:15) [281]<br>  ◦ Ra-A<br>  ◦ Ra-G<br>• [KBC Rijeka - Radiologija] (17:30 - 19:00) [281]<br>  ◦ Ra-F<br>• [KBC SUŠAK-RADIOLOGIJA] (17:30 - 19:00) [287]<br>  ◦ Ra-D | Seminar 2B: Joints of the lower extremity: hip, knee (x-ray, MRI:<br>• [ONLINE] (11:00 - 11:45) [1747]<br>  ◦ R_348<br><br>Seminar 2A: Contrast media in radiology:<br>• [ONLINE] (11:00 - 11:45) [1747]<br>  ◦ R_348<br><br>Seminar 3A: Pituitary gland:<br>• [ONLINE] (11:45 - 12:30) [1854]<br>  ◦ R_348<br><br>Seminar 3B: Head trauma:<br>• [ONLINE] (11:45 - 12:30) [1854]<br>  ◦ R_348<br><br>Seminar 4A: Stroke:<br>• [ONLINE] (12:30 - 13:15) [1854]<br>  ◦ R_348<br><br>Seminar 4B: Radiology in blunt polytrauma (body):<br>• [ONLINE] (12:30 - 13:15) [1854]<br>  ◦ R_348<br><br>Seminar 5B: Radiology in personalized medicine:<br>• [ONLINE] (13:15 - 14:00) [281]<br>  ◦ R_348<br><br>Seminar 5A: Craniofacial trauma:<br>• [ONLINE] (13:15 - 14:00) [281]<br>  ◦ R_348<br><br>Seminar 6B: Radiation hazards and protection:<br>• [ONLINE] (14:00 - 14:45) [281]<br>  ◦ R_348<br><br>Seminar 6A: Adrenal imaging:<br>• [ONLINE] (14:00 - 14:45) [281]<br>  ◦ R_348 |
| nasl. izv. prof. dr. sc. Borić Igor, dr. med. [1747] · Grubešić Tiana, dr. med., asistentica [287] · prof. dr. sc. Miletić Damir, dr. med., redoviti profesor u trajnom zvanju [167] · prof. dr. sc. Rumboldt Zoran, dr. med. [1854] · izv. prof. dr. sc. Valković Zujić Petra, dr. med. [281] | | |
| **22.05.2025** | | |

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| Lecture 18: Pancreas and spleen:<br>• [P11 - KBC RI] (08:00 - 10:30) [167]<br>◦ R_348<br><br>Lecture 19: Small and large intestine:<br>• [P11 - KBC RI] (08:00 - 10:30) [167]<br>◦ R_348<br><br>Lecture 20: Acute abdomen:<br>• [P11 - KBC RI] (08:00 - 10:30) [167]<br>◦ R_348 | P18-20 Pancreas, small and large intestine, acute abdomen:<br>• [KBC SUŠAK-RADIOLOGIJA] (13:30 - 15:45) [286]<br>◦ Ra-F<br>• [ONLINE] (13:30 - 15:45) [167]<br>◦ Ra-B<br>◦ Ra-C<br>◦ Ra-E<br>• [KBC SUŠAK-RADIOLOGIJA] (16:00 - 18:15) [2781]<br>◦ Ra-A<br>◦ Ra-H<br>• [KBC Rijeka - Radiologija] (16:30 - 18:45) [287]<br>◦ Ra-G<br>◦ Ra-D | Seminar 7A: Imaging guided biopsies/drainages:<br>• [ONLINE] (11:15 - 12:00) [167]<br>◦ R_348<br><br>Seminar 7B: Jaundice (the role of radiology):<br>• [ONLINE] (11:15 - 12:00) [167]<br>◦ R_348<br><br>Seminar 2B: Joints of the lower extremity: hip, knee (x-ray, MRI:<br>• [ONLINE] (12:00 - 12:45) [167]<br>◦ R_348<br><br>Seminar 2A: Contrast media in radiology:<br>• [ONLINE] (12:00 - 12:45) [167]<br>◦ R_348<br><br>Seminar 8A: Radiology in COVID patients:<br>• [ONLINE] (12:00 - 12:45) [167]<br>◦ R_348 |
| Grubešić Tiana, dr. med., asistentica [287] · prof. dr. sc. Miletić Damir, dr. med., redoviti profesor u trajnom zvanju [167] · naslovni viši asistent Nadarević Tin, dr. med. [286] · naslovna asistentica Rnjak Jelena, dr. med. [2781] | | |
| **26.05.2025** | | |
| Lecture 21: MSK - Anatomy, Imaging modalities, Fractures/Trauma:<br>• [P11 - KBC RI] (08:00 - 09:30) [1747]<br>◦ R_348<br><br>Lecture 22: MSK - Degenerative, OCD, Osteomyelitis:<br>• [P11 - KBC RI] (08:00 - 09:30) [1747]<br>◦ R_348<br><br>Lecture 23: MSK - Rheumatoid disease, Tumors:<br>• [P11 - KBC RI] (09:45 - 10:30) [279]<br>◦ R_348 | P21-23 Musculoskeletal radiology:<br>• [KBC Rijeka - Radiologija] (13:30 - 15:45) [279]<br>◦ Ra-A<br>◦ Ra-F<br>• [KBC SUŠAK-RADIOLOGIJA] (13:30 - 15:45) [1311]<br>◦ Ra-C<br>◦ Ra-B<br>• [ONLINE] (16:00 - 18:15) [1747]<br>◦ Ra-D<br>◦ Ra-E<br>• [KBC Rijeka - Radiologija] (16:00 - 18:15) [279]<br>◦ Ra-H<br>• [KBC SUŠAK-RADIOLOGIJA] (16:00 - 18:15) [1311]<br>◦ Ra-G | Seminar 9A: Joints of the upper extremity: shoulder, ebow, (x-ray, MRI):<br>• [ONLINE] (11:00 - 11:45) [279]<br>◦ R_348<br><br>Seminar 9B: Lymphoma:<br>• [ONLINE] (11:00 - 11:45) [279]<br>◦ R_348<br><br>Seminar 10B: Obstructive uropathy:<br>• [ONLINE] (11:45 - 12:30) [279]<br>◦ R_348<br><br>Seminar 10A: Gynaecological cancer: uterus:<br>• [ONLINE] (11:45 - 12:30) [279]<br>◦ R_348 |
| nasl. izv. prof. dr. sc. Borić Igor, dr. med. [1747] · naslovna asistentica Miletić Rigo Dina, dr. med. [1311] · doc. dr. sc. Veljković Vujaklija Danijela, dr. med. [279] | | |
| **29.05.2025** | | |

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| Lecture 25: Urinary tract:<br>• [P11 - KBC RI] (08:00 - 10:15) [279]<br>◦ R_348<br><br>Lecture 26: Kidney, Scrotum:<br>• [P11 - KBC RI] (08:00 - 10:15) [279]<br>◦ R_348<br><br>Lecture 27: Ureters, Bladder, Prostate:<br>• [P11 - KBC RI] (08:00 - 10:15) [279]<br>◦ R_348<br><br>Lecture 24: Pediatric radiology:<br>• [ONLINE] (11:15 - 12:00) [280]<br>◦ R_348 | P24-27 Pediatric radiology, urinary tract:<br>• [KBC Rijeka - Radiologija] (13:00 - 16:00) [279]<br>◦ Ra-F<br>◦ Ra-A<br>• [KBC SUŠAK-RADIOLOGIJA] (13:00 - 16:00) [286]<br>◦ Ra-E<br>◦ Ra-C<br>• [ONLINE] (15:30 - 18:30) [167]<br>◦ Ra-D<br>◦ Ra-B<br>• [KBC Rijeka - Radiologija] (16:15 - 19:15) [279]<br>◦ Ra-H<br>• [KBC SUŠAK-RADIOLOGIJA] (16:15 - 19:15) [2763]<br>◦ Ra-G | |
| Brumini Ivan, dr. med. [2763] · prof. dr. sc. Miletić Damir, dr. med., redoviti profesor u trajnom zvanju [167] · naslovni viši asistent Nadarević Tin, dr. med. [286] · naslovni prof. dr. sc. Roić Goran, dr. med. [280] · doc. dr. sc. Veljković Vujaklija Danijela, dr. med. [279] | | |
| **02.06.2025** | | |
| Lecture 28: Head and Neck (H&N) radiology:<br>• [P12 - KBC SUŠAK] (08:00 - 09:30) [281]<br>◦ R_348<br><br>Lecture 29: Breast radiology:<br>• [P12 - KBC SUŠAK] (08:00 - 09:30) [281]<br>◦ R_348<br><br>Lecture 30: Interventional radiology (IR): non-vascular:<br>• [P12 - KBC SUŠAK] (09:45 - 10:30) [167]<br>◦ R_348 | P28-29 H&N radiology, breast:<br>• [KBC Rijeka - Radiologija] (12:00 - 13:30) [281]<br>◦ Ra-A<br>◦ Ra-E<br>• [KBC SUŠAK-RADIOLOGIJA] (12:00 - 13:30) [2781] [1437]<br>◦ Ra-B<br>◦ Ra-F<br>• [KBC Rijeka - Radiologija] (14:45 - 16:15) [281]<br>◦ Ra-C<br>◦ Ra-G<br>• [KBC SUŠAK-RADIOLOGIJA] (14:45 - 16:15) [287] [1437]<br>◦ Ra-D<br>◦ Ra-H<br><br>P 30: IR:<br>• [KBC SUŠAK-RADIOLOGIJA 2] (13:30 - 14:15) [1437]<br>◦ Ra-F<br>◦ Ra-B<br>• [KBC SUŠAK-RADIOLOGIJA 2] (14:15 - 15:00) [1437]<br>◦ Ra-E<br>◦ Ra-A<br>• [KBC SUŠAK-RADIOLOGIJA 2] (16:15 - 17:00) [1437]<br>◦ Ra-D<br>◦ Ra-H<br>• [KBC SUŠAK-RADIOLOGIJA 2] (17:00 - 17:45) [1437]<br>◦ Ra-C<br>◦ Ra-G | |
| Grubešić Tiana, dr. med., asistentica [287] · prof. dr. sc. Miletić Damir, dr. med., redoviti profesor u trajnom zvanju [167] · naslovna asistentica Rnjak Jelena, dr. med. [2781] · doc.dr.sc. Tkalčić Lovro, dr.med. [1437] · izv. prof. dr. sc. Valković Zujić Petra, dr. med. [281] | | |

## List of lectures, seminars and practicals:

| [PREDAVANJA] (TOPIC) | Number of hours | Location |
|---|---|---|
| Lecture 1: X-ray | 1 | [P12 - KBC SUŠAK] |
| Lecture 2: Computed tomography (CT) | 1 | [P12 - KBC SUŠAK] |
| Lecture 3: Magnetic resonance imaging (MRI); ultrasound (US) | 1 | [P12 - KBC SUŠAK] |
| Lecture 4: Digital subtraction angiography (DSA); Hybrid imaging; PACS | 1 | [P12 - KBC SUŠAK] |
| Lecture 5: Basics, Stroke | 1 | [P11 - KBC RI] |
| Lecture 6: Neurotrauma, inflammation, degeneration | 1 | [P11 - KBC RI] |
| Lecture 7: Tumors of the brain and spine | 1 | [P11 - KBC RI] |
| Lecture 8: Anatomy of the respiratory system | 1 | [P12 - KBC SUŠAK] |
| Lecture 9: Basic imaging interpretation in chest diseases | 1 | [P12 - KBC SUŠAK] |
| Lecture 10: Fundamental diseases of the pulmonary parenchyma | 1 | [P12 - KBC SUŠAK] |
| Lecture 11: Pleura, chest wall and mediastinum | 1 | [P12 - KBC SUŠAK] |
| Lecture 12: Heart – imaging features | 1 | [P12 - KBC SUŠAK] |
| Lecture 13: Fundamental diseases of the heart | 1 | [P12 - KBC SUŠAK] |
| Lecture 14: Vascular radiology | 1 | [P12 - KBC SUŠAK] |
| Lecture 15: Interventional radiology (IR): vascular | 1 | [P12 - KBC SUŠAK] |
| Lecture 16: Upper gastrointestinal tract | 1 | [P12 - KBC SUŠAK] |
| Lecture 17: Liver and biliary tract | 1 | [P12 - KBC SUŠAK] |
| Lecture 18: Pancreas and spleen | 1 | [P11 - KBC RI] |
| Lecture 19: Small and large intestine | 1 | [P11 - KBC RI] |
| Lecture 20: Acute abdomen | 1 | [P11 - KBC RI] |
| Lecture 21: MSK - Anatomy, Imaging modalities, Fractures/Trauma | 1 | [P11 - KBC RI] |
| Lecture 22: MSK - Degenerative, OCD, Osteomyelitis | 1 | [P11 - KBC RI] |
| Lecture 23: MSK - Rheumatoid disease, Tumors | 1 | [P11 - KBC RI] |
| Lecture 24: Pediatric radiology | 1 | [ONLINE] |
| Lecture 25: Urinary tract | 1 | [P11 - KBC RI] |
| Lecture 26: Kidney, Scrotum | 1 | [P11 - KBC RI] |
| Lecture 27: Ureters, Bladder, Prostate | 1 | [P11 - KBC RI] |
| Lecture 28: Head and Neck (H&N) radiology | 1 | [P12 - KBC SUŠAK] |
| Lecture 29: Breast radiology | 1 | [P12 - KBC SUŠAK] |
| Lecture 30: Interventional radiology (IR): non-vascular | 1 | [P12 - KBC SUŠAK] |

| [VJEŽBE] (TOPIC) | Number of hours | Location |
|---|---|---|
| P1-4 Imaging modalities, radiological anatomy, nomenclature | 4 | [KBC Rijeka - Radiologija]<br>[KBC SUŠAK-RADIOLOGIJA]<br>[ONLINE] |
| P5-7 Neuroradiology | 3 | [KBC SUŠAK-RADIOLOGIJA]<br>[ONLINE]<br>[P11 - KBC RI] |

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| P8-11 Thoracopulmonary radiology | 4 | [KBC Rijeka - Radiologija] [KBC SUŠAK-RADIOLOGIJA] [ONLINE] |
| P12-15 Cardiovascular imaging and intervention | 4 | [KBC Rijeka - Radiologija] [KBC SUŠAK-RADIOLOGIJA] [ONLINE] |
| P16-17 Upper gastrointestinal and hepatobiliary tract | 2 | [KBC Rijeka - Radiologija] [KBC SUŠAK-RADIOLOGIJA] [ONLINE] |
| P18-20 Pancreas, small and large intestine, acute abdomen | 3 | [KBC Rijeka - Radiologija] [KBC SUŠAK-RADIOLOGIJA] [ONLINE] |
| P21-23 Musculoskeletal radiology | 3 | [KBC Rijeka - Radiologija] [KBC SUŠAK-RADIOLOGIJA] [ONLINE] |
| P24-27 Pediatric radiology, urinary tract | 4 | [KBC Rijeka - Radiologija] [KBC SUŠAK-RADIOLOGIJA] [ONLINE] |
| P28-29 H&N radiology, breast | 2 | [KBC Rijeka - Radiologija] [KBC SUŠAK-RADIOLOGIJA] |
| P 30: IR | 1 | [KBC SUŠAK-RADIOLOGIJA 2] |

| [SEMINARI] (TOPIC) | Number of hours | Location |
|---|---|---|
| Seminar 1A: Orbit | 1 | [P11 - KBC RI] |
| Seminar 3A: Pituitary gland | 1 | [ONLINE] |
| Seminar 6B: Radiation hazards and protection | 1 | [ONLINE] |
| Seminar 2B: Joints of the lower extremity: hip, knee (x-ray, MRI | 1 | [ONLINE] |
| Seminar 3B: Head trauma | 1 | [ONLINE] |
| Seminar 5B: Radiology in personalized medicine | 1 | [ONLINE] |
| Seminar 4A: Stroke | 1 | [ONLINE] |
| Seminar 7A: Imaging guided biopsies/drainages | 1 | [ONLINE] |
| Seminar 7B: Jaundice (the role of radiology) | 1 | [ONLINE] |
| Seminar 5A: Craniofacial trauma | 1 | [ONLINE] |
| Seminar 9A: Joints of the upper extremity: shoulder, ebow, (x-ray, MRI) | 1 | [ONLINE] |
| Seminar 10B: Obstructive uropathy | 1 | [ONLINE] |
| Seminar 8B: Gynaecological cancer: ovary | 1 | |
| Seminar 9B: Lymphoma | 1 | [ONLINE] |
| Seminar 10A: Gynaecological cancer: uterus | 1 | [ONLINE] |
| Seminar 6A: Adrenal imaging | 1 | [ONLINE] |
| Seminar 1B: Extra axial brain tumors | 1 | [P11 - KBC RI] |
| Seminar 2A: Contrast media in radiology | 1 | [ONLINE] |
| Seminar 4B: Radiology in blunt polytrauma (body) | 1 | [ONLINE] |
| Seminar 8A: Radiology in COVID patients | 1 | [ONLINE] |

**EXAM DATES (final exam):**

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|---|---|
| 1. | 13.06.2025. |
| 2. | 01.07.2025. |
| 3. | 01.09.2025. |
| 4. | 15.09.2025. |