



# **CLINICAL MEDICINE 1**

**FOURTH YEAR**

2024/2025

**RADIOLOGY**

Subject:

## **Radiology**

The course is evaluated with 4 ECTS. There are 4 hours of active teaching per week (2 hours of lectures and 2 hours of work in a small group).

## Teachers:

	First and last name	Email adress	Title
1.	Radisa Vojinovic	rhvojinovic@gmail.com	Associate professor
2.	Valentina Opancina	valentina.opancina@gmail.com	Assistant professor
3.	Biljana Brkic	brkicbiljana15@yahoo.com	Assistant professor
4.	Vladan Markovic	drjack.vm@gmail.com	Teaching Assistant

## COURSE STRUCTURE:

Module	Name of the module	Week	Lectures weekly	Work in a small group per week	Teacher
1	Devices in radiology and principles of work, radiology of the heart and lungs	5	2	2	Asst. Prof. Dr. Valentina Opancina
2	Contrast agents and endographic methods, radiology of the abdomen and pelvis, radiology of the breast	5	2	2	Asst. Prof. Dr. Valentina Opancina
3	Radiology of the bone-joint system, interventional radiology, neuroradiology	5	2	2	Asst. Prof. Dr. Valentina Opancina
					$\Sigma 30+30=60$

## EVALUATION:

The grade is equivalent to the number of points won (see tables). Points are earned in two ways:

**ACTIVITY DURING THE LESSON:** In this way, the student can earn up to 30 points. In order to pass the activity during the lesson, the student must obtain more than 50% of the points.

**FINAL EXAM:** Final exam consists of two parts: practical exam and final test. In this way, the student can gain 70 points according to the attached scheme. Practical exam consists of two radiological images that students need to describe in a written manner. Each of radiological imaging findings consists of 10 points, and maximum points on practical exam is 20. In order to pass the practical exam, the student must obtain more than 50% of the points. In order to pass the final test, the student must obtain more than 50% of the points.

### FINAL EXAM 0-70 points

#### EVALUATION OF FINAL TEST

The final test has 25 questions.

Each question is worth 2 points and score is 0-50 points.

Practical exam consists of two radiological images, both scoring 0-10 points, in total 20 points.

#### The final grade is formed as follows:

MODULE		MAXIMUM POINTS		
		ACTIVITY DURING LESSON	FINAL EXAM	Σ
1	Devices in radiology and principles of work, radiology of the heart and lungs	10		
2	Contrast agents and endographic methods, radiology of the abdomen and pelvis, radiology of the breast	10		
3	Radiology of the bone-joint system, interventional radiology, neuroradiology	10		
	<b>FINAL EXAM</b>	<b>30</b>	<b>2x10+50 = 70</b>	<b>100</b>
	<b>Σ</b>		<b>100</b>	

In order to pass the course, the student must obtain a minimum of 51 points, pass pre-exam activities and pass the final exam (test).

<b>number of points won</b>	<b>grade</b>
0 - 50	5
51 - 60	6
61 - 70	7
71 - 80	8
81 - 90	9
91 - 100	10

## LITERATURE:

the name of the textbook	authors	publisher	the library
Diagnostic Radiology, Volume one and two	A.Adam, A.K. Dixon, Grainger&Allison's	Churchill Livingstone	Has
The Radiology Handbook: A Pocket Guide to Medical Imaging	Benseler, J.S.	Athens, United States: Ohio University Press	Has
Fundamentals of Diagnostic Radiology, Fourth Edition	W.E. Brant, C.A. Helms	Wolters Kluwer Health / Lippincott Williams & Wilkins	Has

The presentations and accompanying document in *Word* can be found on the website of the Faculty of Medical Sciences :[www.medf.kg.ac.rs](http://www.medf.kg.ac.rs)

# Program

## MODULE 1

TEACHING UNIT 1 (FIRST WEEK):

### **BASIC PRINCIPLES OF RADIOLOGY PHYSICS, PRINCIPLES OF WORK OF RADIOLOGY MACHINES**

2 hours of lectures	2 hours of work in a small group
-Basic principles of physics in radiology, - modalities and techniques in radiology, - diagnostic devices used in radiology	getting to know more about diagnostic devices used in radiology

TEACHING UNIT 2 (SECOND WEEK):

### **RADIOLOGY DEVICES AND PRICIPLES OF THEIR WORK (ULTRASOUND, COMPUTED TOMOGRAPHY, MAGNETIC RESONANCE)**

2 hours of lectures	2 hours of work in a small group
-Basic principles of physics in radiology, - modalities and techniques in radiology, - diagnostic devices used in radiology	getting to know more about diagnostic devices used in radiology

TEACHING UNIT 3 (THIRD WEEK):

### **RADIOLOGY OF LUNGS AND MEDIASTINUM**

2 hours of lectures	2 hours of work in a small group
- Radiological changes in diseases of the respiratory tract, - Radiological changes in diseases of the mediastinum	- Radiological changes in diseases of the respiratory tract, interpretation of radiographs, - Getting to know the pathology of the lungs and mediastinum on computed tomography

TEACHING UNIT 4 (FOURTH WEEK)

### **RADIOLOGY OF LUNGS AND MEDIASTINUM**

2 hours of lectures	2 hours of work in a small group
- Radiological changes in diseases of the respiratory tract, - Radiological changes in diseases of the mediastinum	- Radiological changes in diseases of the respiratory tract, interpretation of radiographs, - Getting to know the pathology of the lungs and mediastinum on computed tomography

TEACHING UNIT 5 (FIFTH WEEK)

### **RADIOLOGY OF CARDIOVASCULAR SYSTEM**

2 hours of lectures	2 hours of work in a small group
- Examination techniques, - X-ray anatomy of the heart, - Getting to know diagnostic procedures, - Radiological changes in heart diseases	- Heart examination techniques: radiography, computerized tomography and catheterization, - getting to know radiological changes in heart diseases

## MODULE 2

### TEACHING UNIT 6 (SIXTH WEEK)

#### CONTRAST UNITS AND ENDOGRAPHIC METHODS

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>-Introduction to the contrast media used during radiological examinations,</li><li>- Acquaintance with side effects and measures of prevention and treatment of side effects of contrast agents,</li><li>- Introduction to endographic methods in radiology</li></ul>	<ul style="list-style-type: none"><li>-Introduction to the contrast media used during radiological examinations and endographic methods</li></ul>

### TEACHING UNIT 7 (SEVENTH WEEK)

#### RADIOLOGY OF ABDOMEN

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>-RO techniques for examination of the digestive tract,</li><li>-Ro anatomy of the digestive tract</li></ul>	<ul style="list-style-type: none"><li>- Interpretation of Ro examination of the digestive tract, normal Ro anatomy</li></ul>

### TEACHING UNIT 8 (EIGHTH WEEK)

#### RADIOLOGY OF ABDOMEN

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>-Ro pathology of the digestive tract,</li><li>-UZ, CT and MR examinations of the abdomen,</li><li>- Getting to know the pathology of the abdomen using imaging examination techniques</li></ul>	<ul style="list-style-type: none"><li>- Interpretation of Ro examination of the digestive tract</li></ul>

### TEACHING UNIT 9 (NINTH WEEK)

#### RADIOLOGY OF PELVIS

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>- Techniques for examination of the urogenital tract: native urotract, IVU, US, CT, MR,</li><li>- Hysterosalpingography,</li><li>- X-ray anatomy,</li><li>- Radiological changes in diseases of the urogenital tract</li></ul>	<ul style="list-style-type: none"><li>- Interpretation of Ro examination in pathological conditions of the urogenital tract</li></ul>

### TEACHING UNIT 10 (TENTH WEEK)

#### RADIOLOGY OF BREASTS

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>-Ro examination modalities and techniques,</li><li>- Ro and US anatomy of the breast,</li><li>-Benign and malignant changes</li></ul>	<ul style="list-style-type: none"><li>- Interpretation of Ro breast examination</li></ul>



## MODULE 3

### TEACHING UNIT 11 (ELEVENTH WEEK)

#### NEURORADIOLOGY

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>- Examination techniques, X-ray, CT and MR</li><li>- Neurotrauma,</li><li>- Tumors of the CNS,</li><li>- CNS infections</li></ul>	<ul style="list-style-type: none"><li>- Interpretation of Ro examination of the CNS</li></ul>

### TEACHING UNIT 12 (TWELFTH WEEK)

#### NEURORADIOLOGY

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>- Diseases of the white matter of the brain,</li><li>- Non-traumatic intracranial hemorrhage,</li><li>- Brain infarction,</li><li>- Diseases of the spinal column and spinal cord</li></ul>	<ul style="list-style-type: none"><li>- Interpretation of Ro examination of the CNS</li></ul>

### TEACHING UNIT 13 (THIRTEENTH WEEK)

#### INTERVENTIONAL RADIOLOGY

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>- Interventional vascular radiology, modalities and techniques,</li><li>- Percutaneous biopsies,</li><li>- Percutaneous drainage</li></ul>	<ul style="list-style-type: none"><li>- how are therapeutic non-vascular RO procedures performed</li></ul>

### TEACHING UNIT 14 (FOURTEENTH WEEK)

#### INTERVENTIONAL RADIOLOGY

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>- Interventional vascular radiology, modalities and techniques,</li><li>- Catheterization technique,</li><li>- Balloon dilatation and stenting of blood vessels,</li><li>- Embolization of blood vessels</li></ul>	<ul style="list-style-type: none"><li>- how are therapeutic and diagnostic vascular RO procedures performed</li></ul>

### TEACHING UNIT 15 (FIFTEENTH WEEK)

#### RADIOLOGY OF BONE-JOINT SYSTEM

2 hours of lectures	2 hours of work in a small group
<ul style="list-style-type: none"><li>- Examination techniques: X-rays, computerized tomography, magnetic resonance,</li><li>- Trauma of the bone-joint system,</li><li>- Bone tumors,</li><li>- Osteomyelitis</li></ul>	<ul style="list-style-type: none"><li>- Interpretation of the examination of the pathology of the bone-joint system</li></ul>

## WEEKLY COURSE SCHEDULE

COURSE	TUESDAY
<b>RADIOLOGY</b> (2+2)	<b>LECTURES</b> <b>11:25 - 12:55</b> (H4)  <b>PRACTICE</b> <b>15:00 - 21:00</b> (Nuclear Medicine Center UCCK)

## SCHEDULE OF PRACTICE

PRACTICE (2x4 group) - according to the schedule of the department

## SCHEDULE FOR THE COURSE RADIOLOGY

module	week	date	time	place	type	method unit name	teacher
1	1		16:45-18:15		L	<b>BASIC PRINCIPLES OF RADIOLOGY PHYSICS, PRINCIPLES OF WORK OF RADIOLOGY MACHINES</b>	Assoc. Prof. Dr. Radisa Vojinovic
1	1		08:00-13:00		P		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
1	2		16:45-18:15		L	<b>RADIOLOGY MASCHINES AND PRICIPLES OF THEIR WORK (ULTRASOUND, COMPUTED TOMOGRAPHY, MAGNETIC RESONANCE)</b>	Assoc. Prof. Dr. Radisa Vojinovic
1	2		08:00-13:00		P		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
1	3		16:45-18:15		L	<b>RADIOLOGY OF RESPIRATORY SYSTEM</b>	Assoc. Prof. Dr. Radisa Vojinovic
1	3		08:00-13:00		P		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
1	4		16:45-18:15		L	<b>RADIOLOGY OF RESPIRATORY SYSTEM</b>	Assoc. Prof. Dr. Radisa Vojinovic
1	4		08:00-13:00		P		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic

## SCHEDULE FOR THE COURSE RADIOLOGY

module	week	date	time	place	type	method unit name	teacher
1	5		<b>16:45-18:15</b>		<b>L</b>	<b>RADIOLOGY OF CARDIOVASCULAR SYSTEM</b>	Asst. Prof. Dr. Valentina Opancina
1	5		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
2	6		<b>16:45-18:15</b>		<b>L</b>	<b>CONTRAST UNITS AND ENDOGRAPHIC METHODS</b>	Asst. Prof. Dr. Valentina Opancina
2	6		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
2	7		<b>16:45-18:15</b>		<b>L</b>	<b>RADIOLOGY OF ABDOMEN</b>	Asst. Prof. Dr. Valentina Opancina
2	7		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
2	8		<b>16:45-18:15</b>		<b>L</b>	<b>RADIOLOGY OF ABDOMEN</b>	Asst. Prof. Dr. Valentina Opancina
2	8		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
2	9		<b>16:45-18:15</b>		<b>L</b>	<b>RADIOLOGY OF PELVIS</b>	Assoc. Prof. Dr. Radisa Vojinovic

## SCHEDULE FOR THE COURSE RADIOLOGY

module	week	date	time	place	type	method unit name	teacher
2	9		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
2	10		<b>16:45-18:15</b>		<b>L</b>	<b>RADIOLOGY OF BREASTS</b>	Asst. Prof. Dr. Valentina Opancina
2	10		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
3	11		<b>16:45-18:15</b>		<b>L</b>	<b>NEURORADIOLOGY</b>	Asst. Prof. Dr. Valentina Opancina
3	11		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
3	12		<b>16:45-18:15</b>		<b>L</b>	<b>NEURORADIOLOGY</b>	Asst. Prof. Dr. Valentina Opancina
3	12		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
3	13		<b>16:45-18:15</b>		<b>L</b>	<b>INTERVENTIONAL RADIOLOGY</b>	Asst. Prof. Dr. Valentina Opancina
3	13		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic

## SCHEDULE FOR THE COURSE RADIOLOGY

module	week	date	time	place	type	method unit name	teacher
3	14		<b>16:45-18:15</b>		<b>L</b>	<b>INTERVENTIONAL RADIOLOGY</b>	Asst. Prof. Dr. Biljana Brkic
3	14		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
3	15		<b>16:45-18:15</b>		<b>L</b>	<b>RADIOLOGY OF BONE-JOINT SYSTEM</b>	Asst. Prof. Dr. Biljana Brkic
3	15		<b>08:00-13:00</b>		<b>P</b>		Assoc. Prof. Dr. Radisa Vojinovic Asst. Prof. Dr. Valentina Opancina Asst. Prof. Dr. Biljana Brkic Asst. Vladan Markovic
					<b>EXAM</b>		