Course: Radiology
Course Coordinator: Full Professor Damir MIletić, MD PhD
Department: Department of Radiology
Study program: Integrated Undergraduate and Graduate University Study of Medicine in English language
Study year: 4th
Academic year: 2020/2021

SYLLABUS

Course description (a brief description of the course, general instructions, where and in what form the lessons are organized, necessary equipment, instructions for attendance and preparation for classes, student obligations, etc.):

Course objective is to teach medical students on fundamental principles of radiology and image-guided interventions for the most important/common disorders in different clinical settings. It includes basics of radiation biology, radiation protection, imaging modalities and use of contrast media in different radiological modalities. Course of radiology aims to provide students with typical imaging patterns and features which will be trained on clinical examples; 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, periosteal reaction in musculoskeletal imaging; mass effect, haemorrhagic and ischaemic lesions in neuroradiology; occlusions, pathologic vessels, aneurysms, dissections in vascular imaging; contrast opacification patterns and others. Common indications, contraindications and limitations of different imaging techniques should be discussed for each organ system. Another objective is to explain relative value of a radiological examinations in different clinical settings regarding evidence based medicine. Students should observe basic catheterization techniques and arteriographies, image-guided biopsy sampling and drainages.

Assigned reading:

Elsayes KM, Oldham SAA. Introduction to Diagnostic Radiology. McGraw-Hill Education, 2014.
Mettler FA. Essentials of Radiology, Fourth Edition. Elsevier 2019.

Optional/additional reading:n

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

COURSE TEACHING PLAN:

The list of lectures (with topics and descriptions):

Lecture 1: X-ray
Learning outcomes: 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: 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 6: 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 7: 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 8: 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 9: 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 10: 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 11: 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 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: 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: H&N
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
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: 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)

The list of seminars with descriptions:

Seminar 1: Orbit and hypophysis
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 • To have a basic knowledge of sellar tumors

Seminar 2: Radiation risks 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 3: Intravascular contrast media
Learning outcomes: To understand vascular distribution of contrast media after intravenous application • To describe basic characteristics of iodine-based contrast media for radiography and CT • To describe gadolinium-based contrast media for MRI • To define basic characteristics of microbubbles for US • To describe potential hazards of contrast agents

Seminar 4: Radiology in personalized medicine
Learning outcomes: To define principles of personalized/precision radiology • To have a basic understanding of molecular imaging in oncology • To list imaging techniques of in vivo biochemistry and metabolic measurements • To have a basic understanding of imaging biomarkers, radiomics, machine learning and artificial intelligence in radiology

Seminar 5: 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 lymphoma and Hodgkin lymphoma

Seminar 6: Degenerative disease: hip, knee, shoulder
Learning outcomes: To describe imaging features of early degenerative disorders of joints • To define the differences between degenerative and inflammatory lesions on imaging • To list typical degenerative changes of the hip, knee and shoulder on radiograph, CT and MRI.

Seminar 7: Radiology in blunt polytrauma
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 8: 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 9: 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 10: Gynaecological cancer
Learning outcomes: To describe MRI anatomy of the uterus, ovary and Fallopian tubes • To have a basic knowledge of MRI staging of cervical cancer • To define the depth of myometrial invasion in endometrial carcinoma • To discuss imaging features of ovarian cystic masses

Students' obligations:

Evaluation is structured in accordance with the regulations for students' evaluation at the Faculty of Medicine, University of Rijeka. During the course students can gain a maximum of 50% of total points (1,75 ECTS). These points are divided into two groups; in the first group continuous knowledge assessment is performed through 2 colloquiums where students can achieve from 1 to 20 points per colloquium. Continuous knowledge assessment can bring the student up to 40% of total points (1,4 ECTS). In the second group preparation for seminars and student's presentation are evaluated from 1 to 10 points (maximum 0,35 ECTS). At the final exam, students can gain a maximum of 50% of total points (1.75 ECTS). Students can gain up to 20% of total points (0.7 ECTS) on the written part of the final exam and the up to 30% (1,05 ECTS) at the oral part of the final exam.

Assessment (exams, description of written / oral / practical exam, the scoring criteria):

Final class grade	
A (90-100%)	excellent (5)
B (75-89,9%)	very good (4)
C (60-74,9%)	satisfying (3)
D (50-59,9%)	sufficient (2)
F (0-49,9%) (students who obtained less than 25 grade points during all course classes or did not pass the final exam)	unsatisfactory (1)

Other important information regarding to the course:

COURSE SCHEDULE (for academic year 2020/2021)

Date	Lectures (time and place)	Seminars (time and place)	Practicals (time and place)	Instructor
01.03.2021.	L1 (8,00-8,45) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L2 (8,45-9,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L3 (9,45-10,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L4 (10,30-11,15) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
			P (1-4) A & B (12,15-15,15) Microsoft Teams	M. Pušić, dr.med. dr.sc. S.Kovačić, dr.med.
			P (1-4) C & D (15,30-18,30) Microsoft Teams	A. Višković, dr.med. T. Grubešić, dr.med.
04.03.2021.	L5 (8,00-8,45) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L6 (8,45-9,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L7 (9,45-10,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L8 (10,30-11,15) Microsoft Teams			prof.dr.sc. D.Miletić, dr.med.
			P (5-8) A & B (14,00-17,10) Microsoft Teams	A. Višković, dr.med. dr.sc. S.Kovačić, dr.med.
			P (5-8) C & D (14,00-17,00) Microsoft Teams	M. Pušić, dr.med. T. Grubešić, dr.med.
08.03.2021.	P9 (8,00-8,45) Microsoft Teams			prof.dr.sc. Z. Rumboldt, dr.med.
	P10 (8,45-9,30) Microsoft Teams			prof.dr.sc. Z. Rumboldt, dr.med.
	P11 (9,45-10,30) Microsoft Teams			prof.dr.sc. Z. Rumboldt, dr.med.
		S1 (10,45-11,30) Microsoft Teams		prof.dr.sc. Z. Rumboldt, dr.med.
			P(9-11) A & B (12,15-14,30) Microsoft Teams	prof.dr.sc. Z. Rumboldt, dr.med. doc.dr.sc. I. Borić, dr.med.
			P(9-11) C & D (14,45-17,00) Microsoft Teams	prof.dr.sc. Z. Rumboldt, dr.med. doc.dr.sc. I. Borić, dr.med.
11.03.2021.	L12 (8,00-8,45) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L13 (8,45-9,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L14 (9,30-10,15) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L15 (10,30-11,15) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.

			P(12-15) A & B (14,00-17,00) Microsoft Teams	prof.dr.sc. D. Miletić, dr.med. dr.sc. S.Kovačić, dr.med.
			P(12-15) C & D (14,00-17,00) Microsoft Teams	T. Nadarević, dr.med. A. Višković, dr.med.
15.03.2021.	L16 (8,00-8,45) Microsoft Teams			doc.dr.sc. P. Valković Zujić, dr.med.
	L17 (8,45-9,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	1.COLLOQUIUM (Lecture 1 – 11) 10,00-10,30 Merlin			
		S2 (11,00-11,45) Microsoft Teams		D.Šegota, prof.fizike
		S3 (11,45-12,30) Microsoft Teams		dr.sc. S.Kovačić, dr.med.
		S4 (12,30-13,15) Microsoft Teams		dr.sc. S.Kovačić, dr.med.
			P (16-17) A & B (14,00-15,30) Microsoft Teams	dr.sc. S.Kovačić, dr.med. A. Višković, dr.med.
			P (16-17) C & D (15,45-17,15) Microsoft Teams	T. Grubešić, dr.med. M. Pušić, dr.med.
18.03.2021.	L18 (8,00.8,45) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L19 (8,45-9,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
	L20 (9,45-10,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
		S5 (11,00-11,45) Microsoft Teams		T. Nadarević, dr.med.
			P (18-20) A & B (14,00-16,15) Microsoft Teams	T. Grubešić, dr.med. M. Pušić, dr.med.
			P (18-20) C & D (14,00-16,15) Microsoft Teams	dr.sc. D. Veljković Vujaklija, dr.med. T. Nadarević, dr.med.
22.03.2021.	L21 (8,00.8,45) Microsoft Teams			doc.dr.sc. I. Borić, dr.med.
	L22 (8,45-9,30) Microsoft Teams			doc.dr.sc. I. Borić, dr.med.
	L23 (9,45-10,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
		S6 (11,00-11,45) Microsoft Teams		dr.sc. D. Veljković Vujaklija, dr.med.
			P (21-23) A & B (14,00-16,15) Microsoft Teams	doc.dr.sc. I. Borić, dr.med. prof.dr.sc. Z. Rumboldt, dr.med.

			P (21-23) C & D (14,00-16,15) Microsoft Teams	prof.dr.sc. D. Miletić, dr.med. T. Nadarević, dr.med.
25.03.2021.	L24 (8,00- 8,45) Microsoft Teams			prof.dr.sc. G. Roić, dr.med.
	L25 (8,45-9,30) Microsoft Teams			prof.dr.sc. G. Roić, dr.med.
	L26 (9,30-10,15) Microsoft Teams			prof.dr.sc. G. Roić, dr.med.
	L27 (10,30-11,15) Microsoft Teams			dr.sc. D. Veljković Vujaklija, dr.med.
	2.COLLOQUIUM (Lecture 12 – 23) 11,45-12,15 Merlin			
			P (24-27) A & B (14,00-17,00) Microsoft Teams	T. Nadarević, dr.med. T. Grubešić, dr.med.
			P (24-27) C & D (14,00-17,00) Microsoft Teams	prof.dr.sc. G. Roić, dr.med. dr.sc. S.Kovačić, dr.med.
29.03.2021.	L28 (8,00.8,45) Microsoft Teams			doc.dr.sc. P. Valković Zujić, dr.med.
	L29 (8,45-9,30) Microsoft Teams			doc.dr.sc. P. Valković Zujić, dr.med.
	L30 (9,45-10,30) Microsoft Teams			prof.dr.sc. D. Miletić, dr.med.
			P (28-30) A & B (14,00-16,15) Microsoft Teams	T. Grubešić, dr.med. dr.sc. D. Veljković Vujaklija, dr.med.
			P (28-30) C & D (14,00-16,15) Microsoft Teams	doc.dr.sc. P. Valković Zujić, dr.med. prof.dr.sc. D. Miletić, dr.med.
01.04.2021.		S7 (8,00.8,45) Microsoft Teams		dr.sc. S.Kovačić, dr.med.
		S8 (8,45-9,30) Microsoft Teams		T. Grubešić, dr.med.
		S9 (9,45-10,30) Microsoft Teams		doc.dr.sc. P. Valković Zujić, dr.med.
		S10 (10,30-11,15) Microsoft Teams		dr.sc. S.Kovačić, dr.med.

List of lectures, seminars and practicals:

	LECTURES (topic of lecture)	Teaching hours	Place
L1	X-ray	1	Microsoft Teams
L2	Computed tomography (CT)	1	Microsoft Teams
L3	Magnetic resonance imaging (MRI); ultrasound (US)	1	Microsoft Teams
L4	Digital subtraction angiography (DSA); Hybrid imaging; PACS	1	Microsoft Teams
L5	Anatomy of the respiratory system	1	Microsoft Teams
L6	Basic imaging interpretation in chest diseases	1	Microsoft Teams
L7	Fundamental diseases of the pulmonary parenchyma	1	Microsoft Teams
L8	Pleura, chest wall and mediastinum	1	Microsoft Teams
L9	Basics, Stroke	1	Microsoft Teams
L10	Neurotrauma, inflammation, degeneration	1	Microsoft Teams
L11	Tumors of the brain and spine	1	Microsoft Teams
L12	Heart – imaging features	1	Microsoft Teams
L13	Fundamental diseases of the heart	1	Microsoft Teams
L14	Vascular radiology	1	Microsoft Teams
L15	IR: vascular	1	Microsoft Teams
L16	Upper gastrointestinal tract	1	Microsoft Teams
L17	Liver and biliary tract	1	Microsoft Teams
L18	Pancreas and spleen	1	Microsoft Teams
L19	Small and large intestine	1	Microsoft Teams
L20	Acute abdomen	1	Microsoft Teams
L21	MSK - Anatomy, Imaging modalities, Fractures/Trauma	1	Microsoft Teams
L22	MSK - Degenerative, OCD, Osteomyelitis	1	Microsoft Teams
L23	MSK - Rheumatoid disease, Tumors	1	Microsoft Teams
L24	Pediatric radiology	1	Microsoft Teams
L25	Urinary tract	1	Microsoft Teams
L26	Kidney, Scrotum	1	Microsoft Teams
L27	Ureters, Bladder, Prostate	1	Microsoft Teams
L28	H&N	1	Microsoft Teams
L29	Breast	1	Microsoft Teams
L30	IR: non-vascular	1	Microsoft Teams
	Total number of lecture hours	**30**	

	SEMINARS (topic of seminar)	Teaching hours	Place
S1	Orbit and hypophysis	1	Microsoft Teams
S2	Radiation risks and protection	1	Microsoft Teams
S3	Intravascular contrast media	1	Microsoft Teams
S4	Radiology in personalized medicine	1	Microsoft Teams
S5	Lymphoma	1	Microsoft Teams
S6	Degenerative disease: hip, knee, shoulder	1	Microsoft Teams

S7	Radiology in blunt polytrauma	1	Microsoft Teams
S8	Adrenal imaging	1	Microsoft Teams
S9	Craniofacial trauma	1	Microsoft Teams
S10	Gynaecological cancer	1	Microsoft Teams
	Total number of seminar hours	**10**	

	PRACTICALS (topic of practical)	**Teaching hours**	**Place**
P1-4	Imaging modalities, radiological anatomy, nomenclature	4	Microsoft Teams
P5-8	Thoracopulmonary radiology	4	Microsoft Teams
P9-11	Neuroradiology	3	Microsoft Teams
P12-15	Cardiovascular imaging and intervention	4	Microsoft Teams
P16-17	Upper gastrointestinal and hepatobiliary tract	2	Microsoft Teams
P18-20	Pancreas, small and large intestine, acute abdomen	3	Microsoft Teams
P21-23	Musculoskeletal radiology	3	Microsoft Teams
P24-27	Pediatric radiology, urinary tract	4	Microsoft Teams
P28-30	H&N radiology, breast	3	Microsoft Teams
	Total number of practicals hours	**30**	

	Final exam dates
1.	9.4.2021
2.	16.06.2021
3.	06.07.2021
4.	07.09.2021
5.	21.09.2021